Assessment of Investment Intention Based on Financial Literacy, Personality Traits, Behavioral Biases, Investor Traits and Financial Self-Efficacy

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Abstract. Investment is investing money for profit and accepting risks due to future uncertainties. Stocks and mutual funds are common investment options for individuals aiming to build wealth. There are several existing instruments measuring investment intention using 2 to 3 factors. However, none connected them simultaneously. Therefore, this study aims to develop a valid and reliable instrument for assessing investment intention by integrating 5 key factors: financial literacy, personality traits, behavioral biases, investor traits, and financial self-efficacy. The instrument consists of 6 constructs, 15 dimensions, and 52 items. The instrument is validated using content and face validity involving two experts and a focus group containing five investors. The instrument reliability testing was implemented using Cronbach Alpha and Exploratory Factor Analysis (EFA) based on pilot (104 respondents) and main study (272 respondents). The findings show that the overall Cronbach Alpha values are 0.88 (pilot) and 0.92 (main), and the EFA identified 6 factors explaining 87.1% of the total variance, indicating instrument reliability. Strong correlations exist between investment intention and financial literacy (0.85), financial self-efficacy (0.89), and personality traits (0.85), respectively, while moderate correlations with behavioral biases (0.61) and investor traits (0.65). These findings demonstrate that the instrument is valid and reliable, providing a comprehensive tool for assessing investment intention. This tool enhances the understanding of the psychological and cognitive factors influencing investment behavior, offering significant potential for researchers and practitioners in behavioral finance.

Keywords: Instrument, Investment Intention, Financial Literacy, Personality Traits, Behavioral Biases, Investor Traits, Financial Self-Efficacy

1 Introduction

Investing involves allocating resources, such as money, time, and effort, expecting future financial gains or increased consumption [1]. Assets are classified as real (e.g., land, machinery) or financial (e.g., stocks, bonds). Real assets are tangible and used in production, whereas financial assets generate returns through interest, dividends, or

A. Senadjki et al. (eds.), *Proceedings of the 12th International Conference on Business, Accounting, Finance and Economics (BAFE 2024)*, Advances in Economics, Business and Management Research 317,
https://doi.org/10.2991/978-94-6463-666-6_18

capital gains [1, 2]. However, investment carries inherent risks due to the uncertainty of future returns, necessitating that choices align with individual risk tolerance [3].

To better understand investment decisions, assessing the factors influencing investment intention is crucial, defined as a person's willingness to commit to a behavior [4]. Recent studies have identified three factors that shape investment intention: financial literacy, personality traits, and overconfidence bias, a common behavioral bias [5]. These factors interact, shaping how individuals approach investment opportunities and ultimately influencing their decision-making processes and outcomes. Financial literacy encompasses objective and subjective knowledge and is critical for informed decision-making [6, 7]. Studies also show that financial literacy significantly affects investment intention, as individuals with more excellent financial knowledge are better equipped to make informed decisions, leading to more confident and proactive investment behavior [5, 6, 7, 8, 9, 10, 11].

Personality traits significantly influence investment intention [4, 5, 8, 9, 10, 12]. The Big Five Personality Traits Model is widely used for studying individual personality, encompassing extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. Recent studies consistently find that individuals high in extraversion are more willing to engage in riskier investments, while those high in neuroticism tend to be risk-averse and avoid such assets. Although openness does not directly influence investment intention, the effects of openness, agreeableness, and conscientiousness vary across studies, suggesting that these traits do impact investment intention, but their effects differ in direction [4, 9, 10, 12]. Additionally, a preference for innovation and risk-taking propensity is associated with stronger intentions to invest in high-risk or innovative financial products [8].

Behavioral biases can distort investment decision-making, leading to irrational choices [13, 14, 21]. Raut and Kumar (2018) found that individuals who rely on past experiences are especially vulnerable to biases that shape their future investment attitudes and intentions, often resulting in flawed decisions. Baker (2021) demonstrated that different personality traits are subject to varying behavioral biases, influencing the tendencies investors are prone to [16]. Vuković and Pivac (2024) found that overconfidence positively affects long-term investment decisions while herding behavior negatively impacts. Jaiyeoba, Abdullah, & Ibrahim (2020) observed psychological biases among individual investors in Malaysia, such as representativeness, overconfidence, herding, religious biases, and anchoring.

Despite substantial studies on these factors, no studies have simultaneously connected objective financial literacy, subjective financial literacy, the Big Five personality traits, risk behavior, investor traits such as preference for innovation, behavioral biases like overconfidence, anchoring, representativeness, and herding; and self-efficacy. Past studies have typically focused on isolated factors, such as objective financial knowledge, the Big Five personality traits, or one or two behavioral biases in relation to investment intention. This gap underscores the need for a comprehensive study that integrates these elements into a single instrument, enabling a deeper understanding of the drivers of investment behavior. Such an approach would provide a more holistic framework, supporting more effective investment strategies and decision-making.

Therefore, this study aims to develop a valid and reliable instrument for assessing investment intention by integrating 5 key factors: financial literacy, personality traits, investor traits, behavioral biases, and financial self-efficacy.

2 Literature Review

Financial Literacy and Investment Intention

Financial literacy is crucial in shaping effective investment intention and decision-making processes. Rooij, Lusardi, & Alessie (2011) developed a widely used tool that assesses objective and subjective financial knowledge, providing valuable insights into the relationship between financial literacy and investment intention. The objective component is divided into basic and advanced levels. Basic financial literacy includes fundamental concepts such as simple interest, inflation, and the time value of money, while advanced literacy covers financial products, portfolio management, and risk diversification.

Studies indicate that individuals with higher financial literacy are better equipped to process financial information, leading to informed financial decisions [8]. Conversely, individuals with lower financial literacy often exhibit overconfidence and rely on heuristics, such as anchoring, representativeness, and availability, when making investment decisions [17]. Sivaramakrishnan et al. (2017) found that insufficient basic financial knowledge decreases the likelihood of investing in equities, suggesting that foundational financial knowledge positively impacts investment intention. While this basic knowledge can enhance intentions to invest, it often fails to translate into actual investments due to perceived complexities and limited understanding of advanced concepts. In contrast, individuals with advanced financial knowledge are significantly more likely to increase their equity holdings.

Subjective financial literacy refers to a person's self-assessed confidence in their financial knowledge [6, 7]. Studies suggest that individuals with lower objective financial literacy tend to overestimate their capabilities, leading to reliance on heuristics and riskier decisions [17]. Rooij et al. (2011) recommend assessing subjective financial literacy before objective measures to mitigate biases. Additionally, Sivaramakrishnan et al. (2017) found that those who self-report higher financial knowledge are more inclined to invest.

The financial literacy index quantitatively measures objective financial literacy by awarding points for correct assessment answers. Boon, Yee, and Ting (2011) categorized respondents based on test performances, labeling those scoring 60% or higher as having high financial literacy. Those scoring below 60% were further analyzed according to the frequency of "do not know" responses, revealing varying levels of financial understanding among participants.

Personality Traits and Investment Intention

The Big Five personality model is a widely recognized framework in psychological research, comprising five core dimensions: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. This model offers valuable insights into how personality traits influence behaviors, including investment intentions [4, 5, 8, 9, 10, 12], which has significant implications for practitioners, policymakers, and financial educators. While the NEO Five-Factor Inventory (NEO-FFI) includes 60 items for a comprehensive assessment of personality traits, its length can be impractical for investment research, especially when multiple factors are involved. The Ten Item Personality Inventory (TIPI), developed by Gosling et al. (2003), provides a more practical alternative, offering a concise 10-item measure that allows for quick and reliable assessments in investment contexts.

Extraversion, characterized by sociability, assertiveness, energy, and optimism [16], is the preference for high-risk investments fueled by confidence in social interactions and networking [9]. Study by Mayfield et al. (2008) indicates a positive correlation between extraversion and short-term investment intentions, with extraverts generally exhibiting higher financial risk tolerance [18]. Those who are both extraverted and risk-taking are more likely to engage in risky investments than their risk-averse investors [12, 19]. However, extraversion is also associated with behavioral biases such as overconfidence, the disposition effect, anchoring, representativeness, mental accounting, emotional biases, and herd behavior, which can lead to investment mistakes [16, 19]. Their reliance on social networks for investment advice and imitation of others' strategies enhances their confidence and willingness to invest in riskier assets, potentially resulting in the retention of losing investments in hopes of abnormal returns, thereby increasing portfolio risk [19]. Financial advisors can assist extraverts by promoting long-term investment strategies to mitigate impulsive behaviors [16].

Agreeableness, defined by generosity, friendliness, and cooperativeness [5], exhibits mixed effects on investment intention. A study by Sadiq and Khan (2019) found a significant positive correlation between agreeableness and short-term investment intentions, while no relationship was observed in long-term investment intentions. Rodrigues & B.V. (2024) found no significant correlation between agreeableness and financial risk tolerance, suggesting that agreeable individuals may be less inclined to pursue new investments. However, Akhtar & Malik (2023) noted that they might invest in riskier assets to maintain trustworthy relationships within their social networks, often placing greater trust in others than in themselves. Lai (2019) observed that highly agreeable individuals typically prioritize personal judgment over social influences. Jain et al. (2023) highlighted a positive relationship between agreeableness and financial literacy, indicating that agreeable individuals are often more knowledgeable about finances, which can help them mitigate negative external influences and make informed decisions. Additionally, no significant relationship between agreeableness and behavioral biases such as overconfidence, the disposition effect, anchoring, or herding [16], suggesting that agreeable individuals can make rational investment decisions based on their financial knowledge.

Conscientiousness, characterized by traits such as organization, efficiency, and reliability [16], has a varied impact on investment intention. Mayfield et al. (2008) found no significant correlation between conscientiousness and investment intentions, while

Sadiq & Khan (2019) reported it significantly influences both short-term and long-term investment decisions. Akhtar & Malik (2023) noted that conscientious individuals tend to be risk-averse, avoiding impulsive choices and gradually incorporating riskier assets into their portfolios. Conversely, Rodrigues & B.V. (2024) found no consistent link between conscientiousness and financial risk tolerance. Research indicated that high-conscientiousness investors adapt quickly to market changes but may exhibit overconfidence, as identified by both Jain et al. (2023) and Ahmad (2020). Baker (2021) highlighted that conscientiousness correlates with various behavioral biases, including overconfidence, anchoring, and mental accounting, but not with the disposition effect or herding behavior. To mitigate these biases, financial advisors should encourage long-term investment strategies that reduce emotional biases and overconfidence, ultimately preventing excessive trading and improving returns [16].

Neuroticism, characterized by emotional instability, and anxiety [16], negatively impacts financial decision-making and investment intentions, significantly influencing risk behavior [9], financial risk tolerance [18], and financial literacy [5]. Individuals high in neuroticism are often risk-averse, avoiding risky assets due to low confidence and limited financial knowledge, which leads them to rely on external advice or engage in herd behavior, resulting in poor investment decisions, such as prematurely selling profitable stocks or holding onto losing investments for too long [19]. They are also prone to various behavioral biases, including disposition effect, anchoring, representative bias, emotional bias, and herding behavior, with no connection found to overconfidence or mental accounting [16]. Financial literacy can mitigate the impact of neuroticism on investors' risk behavior [9]. To support neurotic clients, financial advisors can recommend risk-management strategies, such as stop-loss orders, to help protect them from significant losses and enhance their confidence in decision-making [16].

Openness to experience, characterized by traits such as active imagination, intellectual curiosity, and innovation [16], empowers individuals to explore unconventional opportunities and take calculated risks. Recent studies found a strong positive correlation between openness and investor risk behavior, suggesting that those high in this trait are more inclined to pursue risky investments, believing in their capacity for sound decision-making [9]. Rodrigues & B.V. (2024) further noted that openness positively influences financial risk tolerance, as open individuals feel less anxious about investing in innovative assets due to their adaptability and curiosity. Baker (2021) noted that openness is linked to mental accounting bias, where investors view their assets in isolation rather than as part of a comprehensive portfolio, which can lead to suboptimal decisions. In contrast, other biases such as overconfidence, the disposition effect, anchoring, representativeness, emotional bias, and herding show no significant correlation with openness. To mitigate these biases, it is recommended that financial advisors help open-minded investors adopt a more holistic perspective by evaluating their investments collectively, ensuring their decisions align with their broader financial objectives [16].

Investor Traits

In addition to the Big Five personality traits, Akhtar and Das (2019) introduce investor traits consisting of two additional dimensions relevant to investment intention: Preference for Innovation (P.I.) and Risk-Taking Propensity (RTP). P.I. reflects an individual's openness to new financial opportunities, while RTP captures their willingness to engage in riskier investments. Their research indicates that financial self-efficacy mediates the relationship between P.I, RTP, and investment behaviors, suggesting that individuals with greater financial self-efficacy are more likely to act on their innovative and risk-taking tendencies.

Behavioral Biases

Behavioral finance emphasizes that financial markets frequently exhibit inefficiencies due to investors deviating from rational decision-making [13, 14, 21], often influenced by emotional and cognitive biases [29]. As defined by Barberis and Thaler (2002), rationality involves the ability to quickly and accurately update beliefs based on new information, which is essential for sound investment decisions. However, a growing body of literature in behavioral finance acknowledges that investors frequently diverge from rational behavior. Emotion, attitude, and experience significantly impact an individual's risk tolerance and can limit their ability to make sensible decisions [13, 16, 17, 18, 20, 22].

Investors' irrational behavior is often driven by behavioral biases, which can be categorized into two primary types: emotional biases, rooted in feelings and intuition, and cognitive biases, arising from the brain's reliance on heuristics for quick information processing [23]. Heuristics are mental shortcuts or decision rules that simplify complex decision-making processes, particularly in uncertain situations [20].

Vukovic and Pivac (2024) highlighted that the gap between actual and self-assessed knowledge is overconfidence. Overconfidence bias occurs when investors overestimate their knowledge, skills, and abilities and underestimate investment risk [13, 16], believing they can make accurate decisions. This often leads to excessive trading and higher transaction costs, ultimately reducing returns [24]. While overconfidence can be detrimental in the short term, it may enhance long-term decision-making as experience and knowledge accumulate [20].

Yakuban, Shyamasundar, and Ramar (2015) state that investors use representativeness as a heuristic, forming expectations based on perceived patterns from past events. They often favor companies with familiar attributes, such as management reputation or product quality, while neglecting crucial factors like market conditions and financial metrics [25]. This bias leads to preferences for "hot" stocks and aversion to historically underperforming ones [17, 24]. Although inexperienced investors are more prone to this bias, experience can help reduce its impact.

Jain et al. (2022) defined anchoring bias as the tendency of individuals to rely excessively on limited information, such as news, trading volumes, or daily returns, as reference points when making investment decisions. Investors often use the initial stock purchase price or the most recent highest price as an anchoring point, perceiving a stock as undervalued if its price falls below this level, even when new and more relevant information suggests otherwise. This reliance on an initial reference point can delay

decision-making, especially if the anchor is based on overly optimistic or misleading data. Consequently, investors may hold underperforming stocks longer than necessary or fail to adapt to changing market conditions.

Herding bias describes the tendency to follow the actions of others, often without conducting independent analysis [17, 24]. This behavior is common during periods of uncertainty when investors lack sufficient information. Kumar and Goyal (2016) distinguish between rational herding, where investors follow credible information, and intentional herding, where actions are mimicked without adequate analysis. Individual investors are prone to intentional herding, undermining thoughtful, long-term investment strategies [20].

Financial Self-Efficacy

Akhtar and Das (2019) replaced perceived behavioral control (PBC) with financial self-efficacy in their study, highlighting its crucial role in shaping the relationship between personality traits and investment intention. They found that individuals with a strong preference for innovation (PI) and risk-taking propensity (RTP) are more likely to invest in financial assets with high financial self-efficacy, as it boosts their confidence in managing investments. Cheng and Sang (2022) further expanded on this by demonstrating that financial self-efficacy partially mediates the relationship between financial literacy and investment intention. They showed that individuals with high financial self-efficacy are less dependent on their financial literacy, as their self-confidence in financial decisions reduces the direct impact of financial knowledge on their intention to invest. This highlights self-efficacy's significant role in encouraging risk-taking and informed investment decisions.

3 Methodology

Figure 1 presents the instrument development process, which begins with designing items based on 6 constructs: investment intention, financial literacy, personality traits, behavioral biases, investor traits, and financial self-efficacy that are established from theories and past studies as outlined in the introduction and literature review sections. Next, the instrument was validated by two experts for content validity and revised. This was followed by face validity involving a focus group of 5 investors checking their understanding of the items and rephrasing. Table 1 lists the 6 constructs, 15 dimensions and 52 items of the instrument finalized after going through content and face validity. The 10-point numerical scale (1 until 10) was used in the item measurement. Pilot and main studies were conducted to test the instrument reliability (Figure 1) using Cronbach Alpha and Exploratory Factor Analysis (EFA). Random sampling was used to select the respondents for both studies, which involved 104 and 272 respondents, respectively.

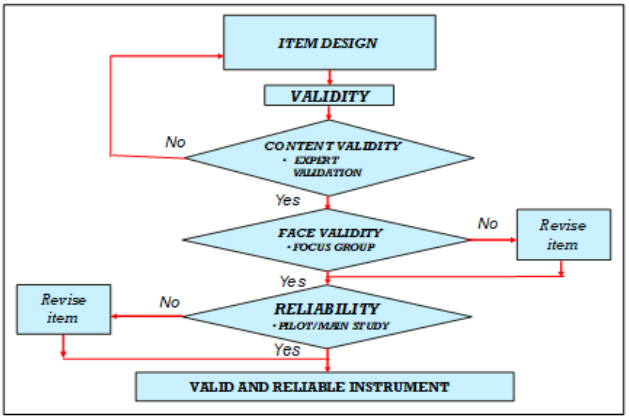

Fig. 1. Instrument Development Process

Table 1. List of Instrument Constructs, Dimensions, and Number of Items

Constructs	**Dimensions**	**Number of Items**
Investment Intention (8 items)	Short term	4
	Long term	4
Financial Literacy (8 items)	Subjective	1
	Objective	7
Personality Traits (10 items) (Big five traits)	Extraversion	2
	Agreeableness	2
	Conscientiousness	2
	Neuroticism	2
	Openness	2
Behavioral Biases (16 items)	Representativeness Bias	4
	Overconfidence Bias	4
	Herding Bias	4
	Anchoring Bias	4
Investor Traits (6 items)	Preference for Innovation	3
	Risk-Taking Propensity	3
Financial Self-Efficacy (4 items)	Managing Finances	2
	Achieving Financial Goals	2
Total 6 Constructs	**15 Dimensions**	**52 items**

4 Findings and Discussions

Table 2 presents the respondent's profiles for the pilot and main study. Most respondents are adults aged 31 to 40, with nearly equal gender distribution (female: 52%-53%). The majority (54%) hold degrees, and around 91% are in full-time employment, earning RM 3,001-RM 6,000 monthly.

Table 2. Demographics Profile of Respondents

		Pilot Study		**Main Study**	
Demographic		Frequency	%	Frequency	%
Age	21-30 years	28	26.9	73	26.84
	31-40 years	**42**	**40.4**	**126**	**46.32**
	41-50 years	24	23.1	53	19.49
	51-60 years	10	9.6	20	7.35
Gender	Female	**55**	**52.9**	**141**	**51.84**
	Male	49	47.1	131	48.16
Education	SPM	8	7.7	21	7.72
	STPM	10	9.6	26	9.56
	Diploma	17	16.3	40	14.71
	Degree	**56**	**53.8**	**148**	**54.41**
	Master	13	12.5	37	13.60
Occupation Status	Full-time	**95**	**91.3**	**247**	**90.81**
	Part-time	9	8.7	25	9.19
Gross Monthly Income	Below RM 3,000	17	16.3	48	17.65
	RM 3,001 - RM 6,000	**44**	**42.3**	**94**	**34.56**
	RM 6,001 - RM 9,000	27	26.0	74	27.21
	RM 9,001 - RM 12,000	15	14.4	52	19.12
	RM 12,001 - RM 15,000	1	1.0	4	1.47
Investment Experience	1-5 years	**59**	**56.7**	**133**	**48.90**
	6-10 years	24	23.1	80	29.41
	11-15 years	14	13.5	38	13.97
	16-20 years	7	6.7	11	4.04
	More than 20 years	0	0	10	3.68
	Total	**104**	100	**272**	100

The instrument has good internal consistency where all constructs exceeded the acceptable range of 0.70, as indicated by Cronbach's Alpha values in Table 3. The overall Cronbach Alpha values for the pilot are 0.88 and 0.92 for the main study. These findings confirm that the items are reliable in measuring the constructs. Based on the Cronbach Alpha results that show consistency for pilot and main study, the data for both studies

are combined (with a total of 376 respondents) in conducting Exploratory Factor Analysis (EFA).

Table 3. Cronbach Alpha for Pilot and Main Study

Constructs	**Cronbach Alpha**	
	Pilot Study (104 respondents)	**Main Study (272 respondents)**
1. Investment Intention (8 items)	0.875	0.972
2. Financial Literacy (8 items)	0.736	0.734
3. Personality Traits (10 items) (Big five traits)	0.789	0.727
4. Behavioral Biases (16 items)	0.863	0.872
5. Investor Traits (6 items)	0.739	0.936
6. Financial Self-Efficacy (4 items)	0.781	0.946
Overall	**0.877**	**0.918**

Table 4 summarizes the EFA results implemented on the instrument dimension. The Kaiser-Meyer-Olkin (KMO) measure was 0.87 (see Table 4), well above the acceptable threshold of 0.60, indicating an adequate sample size for factor analysis. Bartlett's test of sphericity also yielded significant results ($p < 0.01$), confirming sufficient correlations among the dimensions. Six factors are identified that collectively explained 87.1% of the total variance. This substantial proportion of variance explained suggests that the identified factors effectively capture the underlying structure of the instrument, ensuring a comprehensive understanding of the measured constructs. Many factor loadings exceeded 0.50, demonstrating strong correlations between dimensions and their respective constructs. These significant loadings confirm that the dimensions are closely related to the constructs they are designed to measure, showing high reliability and supporting the instrument's effectiveness in assessing investment intentions.

Table 4. Exploratory Factor Analysis (EFA) Summary Results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)						0.868	
Bartlett's Test of Sphericity (p-value)						3116.532 (0.001)	
Number of Factors Extracted		6	Total Variance Explained			87.132%	
Construct	**Dimension**	**Factor Loading**					
		1	2	3	4	5	6
1.Investment Intention	Short term	0.928					
	Long term	0.907					
2.Financial Literacy	Subjective		0.917				
	Objective		0.685				
3.Personality Traits	Extraversion			0.376			
	Agreeableness			0.380			
	Conscientiousness			0.518			
	Neuroticism			0.361			
	Openness			0.384			
4. Behavioral Biases	Representativeness Bias				0.473		
	Overconfidence Bias				0.846		
	Herding Behavior				0.858		
	Anchoring Bias				0.750		
5.Investor Traits	Preference for Innovation					0.696	
	Risk-Taking Propensity					0.728	
6.Financial Self-Efficacy	Managing Finances						0.893
	Achieving Financial Goals						0.885

Table 5 displays the correlation results between investment intention with 5 constructs. The correlation results showed improvement in the main study compared to the pilot study. Strong correlations exist between Investment Intention and Financial Literacy (0.85), Personality Traits (0.85), and Financial Self-Efficacy (0.89), respectively, and moderate correlation with Behavioral Biases (0.61) and Investor Traits (0.65).

Table 5. Correlation Between Investment Intention with 5 Constructs

Correlation		5 Constructs				
		Financial Literacy	Personality Traits	Behavioral Biases	Investor Traits	Financial Self-Efficacy
Investment Intention	Pilot	0.292**	0.191**	0.496**	0.586**	0.457**
	Main	0.846**	0.847**	0.605**	0.654**	0.892**

5 Conclusion and Recommendations

This study successfully developed a comprehensive, valid, and reliable instrument for measuring investment intention, incorporating essential factors of financial literacy, personality traits, behavioral biases, investor traits, and financial self-efficacy. The validation process included rigorous assessments, confirming content validity through expert reviews and face validity via investor feedback. The high Cronbach's Alpha values from reliability assessments affirm the instrument's robustness and reliability.

Exploratory Factor Analysis (EFA) provided significant insights into the instrument's structure, demonstrating that the measurement dimensions accurately capture the intended constructs. The high explained variance and significant factor loadings indicate that the instrument effectively reflects the complexities of investor behaviors and intentions. Moreover, significant results from the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity confirmed the appropriateness of the sample size and the correlations among dimensions.

Future studies should explore the identified dimensions across various demographic groups to enhance the instrument's applicability in different investment contexts. This instrument is a valuable foundation for investigating the intricate relationships among key factors influencing investment intentions, providing practical insights for financial planners to tailor products and educational programs to specific investor profiles. Understanding personality traits and behavioral biases is crucial for effectively assessing investment intentions. By quantifying these biases, the instrument can shed light on their influence on investor decisions, ultimately facilitating the development of strategies to mitigate adverse effects and encourage rational investment behavior. The goal is to empower investors to recognize and manage their biases, leading to better investment choices that align with their financial objectives and risk tolerance.

Despite its strengths, the instrument's length may contribute to participant fatigue, suggesting the need for future revisions aimed at brevity while maintaining comprehensiveness. This study provides a holistic understanding of investment behavior, emphasizing the interplay of personality traits, financial literacy, behavioral biases, investor traits, and financial self-efficacy in shaping investment decisions.

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