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Role of Locus of Control in Moderating Financial Literacy and Behavior in the Banking Sector

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ABSTRACT

This study aims to examine the moderating role of locus of control in the relationship between financial literacy and financial behavior in Pakistan's banking sector. The study adopts a quantitative research approach, utilizing an explanatory research design. Data were collected through a structured questionnaire using a surveybased method. A convenience sampling technique was employed, with a sample size of 192 respondents. The results indicate a significant positive relationship between financial literacy and financial behavior. Additionally, both internal and external locus of control were found to be positively associated with financial behavior. However, the moderating role of locus of control in the relationship between financial literacy and financial behavior was not statistically significant. Practical implications – The findings provide valuable insights for policymakers and practitioners in the banking sector to design financial literacy programs and behavioral interventions that enhance financial well-being. Understanding the role of financial literacy and locus of control can aid in developing targeted strategies for improving financial decision-making among individuals. This study contributes to the literature by examining the interplay between financial literacy, locus of control, and financial behavior within Pakistan's banking industry. It offers empirical evidence on how these factors shape financial decision-making, providing implications for financial education and behavioral finance research.

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Introduction

Financial sector in Pakistan is experiencing remarkable development which leads to emerging complex financial products and availability of information for investors (Khawar and Sarwar, 2021). Thus, this financial development inherits certain inevitable challenges while making financial decisions. Hence, Financial Literacy is an assessment tool that helps to understand these financial inclusions and Locus of Control (LoC) impact the financial behavior of investor (Song et al., 2023). Moreover, increasing level of money management issued faced by an individual highlights the need of analyzing Financial Behavior (FB) of an individual (Sabri et al., 2023). Albeit, global indebtedness rate drastically increasing around 45% since 2020 (after covid-19) and global individual savings rate exhibits a declining trend since recent global crisis (Tiftik et al., 2019). Studying behavioral finance is not only beneficial for academic researchers but also practitioners, financial institutions and business communities (Malik et al., 2015). Inability of classical finance to address methodological issues pertaining to FB had led to emergence of new theories e.g. Prospect Theory (Kahneman and Tversky, 1979). In contrast with effective market hypothesis, theories in behavioral finance highlighted the importance of psychological factors of individual while making Financial Decisions (Ameliawati and Setiyani, 2018). Numerous studies have emphasized the significance of personal traits, demographic factors, and sociological factors in understanding FB and an individual's capacity to tolerate risks. Additionally, investigating the impact of psychological, sociological, and cultural factors on financial decision-making and risk tolerance is crucial (Mutlu and Özer, 2021).

Financial Literacy explains the capacity of making sound judgments with adequate decisions related to use and management of money. It further expedites the capability of financial understanding for an individual while making financial decisions along with numerous issues throughout their lives. In academic literature, its often defined as the understanding of financial products. However, in practical terms, It encompasses the ability to utilize information, knowledge, skills, and experience to effectively and efficiently manage one's financial resources for long-term financial security (Cobb-Clark et al., 2016). Financial Literacy exposes certain levels such as high or low. Therefore it is expected that level of Financial Literacy usually high in individual investors because they want to reach the highest return by adopting various strategies and optimized combinations of available financial resources. Moreover, spread of information and evolvement in information and technology, many studies reported that it remained significantly low (Lusardi and Mitchell, 2011). Despite, few studies witnessed the level of FL is low amongst young people, women and people with inadequate level of education (Lusardi and Mitchell, 2011). Hence, policy makers of developed and developed countries are more concerned with FL due to recent global financial crisis (After Covid-19 Effects and Ukrain-Russia War) and arranging seminars and training session to spread financial literacy (Hardini et al., 2023).

LoC refers to an individual's perception of the primary causes of events in their life. It is another feature that impact financial behavior of an individual. Consequently, Rotter's theory of financial learning (Rotter, 1966) elucidates that how LoC varies that how an individual perceived his/her personal responsibility in the occurring events. The theory focuses on the degree of outputs due to related external factors (Fate or chance) or because of individual's own internal characteristics. Individuals who own Internal Locus of Control are more motivated and willing, exhibit more responsible financial behavior than individuals who believe in External Locus of Control (ELoC). Perry and Morris (2005) highlighted the importance of LoC while determining FB.

Financial decision making is a considerable factor because it has powerful impact on future welfare level of an individual (Iram et al., 2023). This articulated research work focused on the role of LoC and FL in determination of FB of an investor related to angle of behavioral finance universe (Huda et al., 2023). The novelty of this research work is to unveil existing gap in this field and generate useful findings that may guide decision makers and stakeholder while making financial decisions (Kumar et al., 2023). The target population was individual who are client of banking industry therefore applicability of this research is impactful in banking industry, structural equation modeling is employed to dent the findings. Discussion of the study will be highlighting key determinants e.g. ILoC, ELoC, and FL, which are focused variables that have significant impact to explain FB of an investor in Pakistan. Considerable value addition in existing literature is made by using LoC as moderating variable in between FL and FB. Going forward, we have not only seen moderating effect of LoC in between FL and FB we also noticed direct impact of each of three variables which is another contribution in the existing literature.

Our research ventures beyond the mere geographical extension of existing theories to the Pakistani context. It articulates the discourse on behavioral finance by incorporating "Locus of Control (LoC) Theory" prescribed by Rotter (1966) with financial literacy and behavior, dents new empirical evidence on the considerable relationship amid behavioral factors. Unlike prior studies, which are predominantly focused on direct relationships/association, our study meticulously unraveled the moderating effects of internal and external LoC, exploring new insights into how different facets/dimension of LoC impact financial behaviors in the face of varying levels of financial literacy.

This investigation is specifically poignant given unique financial landscape of Pakistan, classified as a low financial literacy rate (26%) and a burgeoning banking sector with an array of complex financial products and rapid growth in financial inclusion, Fintech and healthy competition. Our findings elaborate the distinct dimensions of financial decision-making within this context, having novel contribution to the literature by witnessing that how psychological factors such as LoC could significantly modulate the effect of financial literacy on financial behaviors. This meaningful insight is pivotal for developing tailored financial education programs and policies aimed at improving financial well-being in emerging markets.

Moreover, our research employs Structural Equation Modeling (SEM), allowing for a more sophisticated analysis of the relationships among aforesaid variables. This methodological rigor adds to the originality of our work and dent a healthy methodological contribution. Furthermore, providing a robust framework for investigating the direct and indirect effects of financial literacy and LoC on financial behavior. Hence, our study not only fills a gap in the behavioral finance literature but also offers practical implications for banking institutions and policymakers in emerging economies like Pakistan.

The motivation of research begins after seeing that the Pakistani financial sector has grown substantially, introducing complex financial products and increasing access to investor information. This growth necessitates a deeper understanding of financial decision-making. However, navigating this evolving landscape poses challenges, highlighting the importance of robust financial literacy as a key tool. The role of Locus of Control (LoC) in shaping financial behavior (FB) is particularly crucial, yet underexplored in Pakistan's unique financial context. Additionally, the global rise in indebtedness and fluctuating savings rates post-COVID-19 spotlight the need to comprehend FB through a behavioral finance lens. A significant FL gap is evident in Pakistan, notably among youth, women, and the less educated, underscoring the urgency for targeted financial education. With Pakistan's FL rate at only 26%, compared to the 70% average in developed countries, addressing financial inclusion and literacy becomes imperative.

This research uniquely blends behavioral finance theories with Locus of Control (LoC) to offer new perspectives on financial decision-making in Pakistan's banking sector. It applies Rotter's theory to examine how LoC affects financial behavior (FB) and how financial literacy (FL) and LoC influence FB in the wake of global crises like COVID-19. The findings provide valuable insights for banking institutions and policymakers to enhance FL and FB, particularly in emerging markets. The study also underlines the importance of targeted financial education for groups with lower FL, helping investors make more informed decisions. Methodologically, the research utilizes Structural Equation Modeling for in-depth analysis of the FL, LoC, and FB interplay. It includes extensive data from a broad range of banking sector participants and analyzes both the moderating role of LoC and the direct effects of each variable, significantly contributing to academic literature in this field.

Following are the sections which will be covered as follows. Section two is literature review which will be pertaining theoretical foundations, development of hypothesis and related studies in this field. Section three is research methodology, which will be explaining the process and methods of collecting data and finalizing results. Section four is based on the discussion of findings and results, pointing future research direction and limitation of this research.

Global Disparities in Financial Literacy

Financial literacy is an essential skill for individuals to make informed and effective decisions about their financial resources. In underdeveloped countries, there is a significant gap in awareness and understanding of basic financial concepts such as saving, budgeting, investing, and debt management. According to the Global Financial Literacy Survey conducted by S&P, only 33% of adults worldwide are financially literate. However, in underdeveloped countries, the figures are even lower—for instance, only 26% in South Asia and as low as 13% in some Sub-Saharan African nations. This gap leads to poor financial decision-making, vulnerability to fraud, and missed opportunities for wealth accumulation. Comparing this with developed countries like Germany or Canada—where financial literacy rates exceed 65%—shows the pressing need for focused educational interventions in less developed regions. Enhancing financial awareness can empower individuals to better manage their personal finances and contribute to overall economic development.

Problem statement

Financial literacy is a critical skill for individuals to make informed decisions about their financial resources. However, in many underdeveloped regions, there is a significant disparity between the actual and ideal levels of financial literacy. In the ideal situation, individuals in these regions would possess a solid understanding of basic financial concepts, such as saving, budgeting, investing, and managing debt, enabling them to make informed financial decisions. In contrast, the current reality reveals that financial literacy rates are far lower, especially in South Asia and Sub-Saharan Africa, where many individuals lack the necessary skills and knowledge to manage their finances effectively. For instance, while global financial literacy stands at only 33%, these regions report literacy rates as low as 13%, leading to poor financial choices, vulnerability to scams, and missed opportunities for economic growth. Bridging this gap is essential for empowering individuals and fostering economic stability in these underdeveloped areas.

Significance of the Study

The complexity of modern financial services and products in Pakistan demonstrates why it became imperative to teach financial literacy especially to women and young individuals and rural communities. The inadequate knowledge about finance leads people to make bad financial decisions and become more vulnerable to fraudulent schemes and fail to benefit from official banking channels. This research explores Pakistan's current financial literacy standards as well as its relevant factors and presents potential methods to advance financial education. The research outcomes aim to help financial establishments together with legislators and teachers develop literacy programs to boost economic stability by promoting responsible money management practices.

Research Objectives

1. This research investigates financial literacy levels operated by people who reside in the underdeveloped regions particularly South Asia and Sub-Saharan Africa.
2. Research compares financial literacy knowledge between developing nations along with Germany and Canada on four essential financial principles that include budgeting and savings and investing and managing debt collections.
3. The research investigates both personal financial choice effects and economic development patterns from improved financial literacy in nations that are underdeveloped.

4. The research explores major obstacles that restrict underdeveloped nations from achieving financial literacy by combining factors such as education deficits and resource constraints and knowledge scarcity.
5. A set of strategies together with intervention methods needs evaluation for underdeveloped regions to boost financial literacy and develop better financial choices and economic success.

Research Questions

1. What is the current level of financial literacy among different demographic groups in Pakistan (e.g., students, workers, women, rural vs. urban populations)?
2. What factors (education, income, access to financial services, etc.) influence financial literacy in the Pakistani context?
3. How does the financial literacy rate in Pakistan compare with other developing and developed countries?
4. Which factors stop the advancement of financial literacy in Pakistan become the main focus?
5. What methods should Pakistani financial literacy institutions follow when creating implementation structures for teaching responsible financial behavior and economic enhancement?

Review of Existing Literature

Financial Literacy

National Foundation for Education Research (NFER) used word "Financial Literacy " as an official term in 90s and which was described as "The ability executes informed judgment, efficient procedures and effective decision while making financial decision or decision related to money management" (Meriam et al., 2023). Going forward, it is also defined by another study that FL is "Ability, willingness, skills and level of knowledge to manage someone's wealth and ensure sustainability" (Sam et al., 2022). International Network on Financial Education (INFE) defines FL as "Set of level of knowledge, concurrent awareness, adequate attitude, essential skills and behavioral factors are required to cop up with financial challenges and come up with sound decision making which not only safeguards the wealth of investor/individual but also dictate financial resources future security" (Ameliawati and Setiyani, 2018). PISA defines FL "Understanding of financial concept and financial products in financial trade-off through knowledge, skills and effective decisions" (Adriani, 2021). Moreover, Hadianto and Mariana (2023) explains financial well-being is the result of effective application of financial application. Setianingsih et al. (2022) emphasize that FL is the skill to understand the concept of saving and spending, planning and budgeting and timely decision making. Hidayati and Nugroho (2023) describes FL is the skill of understanding borrowing cost, acquiring information to earn money, management of money and skill to optimized earned money. However, Cobb-Clark et al. (2016) analyzed FL as developed senses of self-worth, continuous learning, and enthusiastic behavior of an individual. In contrast, FL may be considered as a habit of an individual to develop financial trade of between saving and spending. Last not least, FB intertwines with the promotion of entrepreneurial spirit, work ethics, and the cultivation of compassionate, empathetic, and demonstrative conduct (Adriani, 2021).

Locus of Control (LoC)

Internal Locus of Control (ILoC)

Setianingsih et al. (2022) explains Internal Locus of Control (ILoC) as every individual is responsible for his/her success or failure himself/herself. Information, skills, attitude, and behavior shape internal control in financial decision-making, affecting outcomes and investor responses (Sam et al., 2022). ILoC plays a pivotal role in shaping individual financial behavior, making it a crucial concept in behavioral finance studies (Cobb-Clark et al., 2016). The merge of psychological science and financial science involves individuals attributing events in their lives, including financial decisions, to their ILoC (Malik et al., 2015). Last not least, FL plays a vital role in an individual's life by enhancing the value of financial decisions, boosting confidence levels, and influencing the outcomes of those decisions (Adriani, 2021).

External Locus of Control (ELoC)

Sam et al. (2022) defines External Locus of Control (ELoC) as success or failure is beyond the access of individual and external factor influence the results. FL integrates ELoC into ILoC through experience, narrowing the gap and enhancing decision-making in financial activities (Ameliawati and Setiyani, 2018). Going forward, FL enhances skills in analyzing external factors for better understanding and forecasting, shaping individual decision-making (Rahmawati and Marcella, 2023). Psychology illuminates the behavioral and cognitive processes in understanding the external environment, including positive and negative situations within an individual's ELoC (Gunawan et al., 2023).

Financial Literacy Model

Financial Literacy is classified in few of essential financial theory in behavioral finance universe that deals with multiple variations of financial knowledge created by investor's attitude on financial management and their behavior while making financial management. The theory defines risk mitigation and trade-off between the saving & expenditures and making the most of available useable income of the investors. It further accelerates capacity of financial decision making (Pg Md Salleh, 2015). Training on Financial Literacy extends level of knowledge and improve decision making of investors. Therefore, financial education strengthens skill of financial decision making and play pivotal role in attitude building to bring up responsible behavior (Lusardi and Mitchell, 2011). FL theory links knowledge, behavior, and attitude, showing the positive impact of knowledge on behavior and attitude, supported by evidence of increased exposure leading to improved FB (Servon and Kaestner, 2008; Lyons et al., 2006). Lastly, financial literature plays instrumental role in the determination of personal financial management.

Related Studies

Arifin and Widjaya (2022) studied on non-depository investors demonstrated significant positive associations between financial experience, knowledge, LoC, and FB. Whereas, Handoyo et al. (2021) found LoC as mediator between two term, with financial knowledge and income as additional determinants. Purposive sampling and multiple regression analysis confirm significant impacts. Purnamawati (2021) investigated significant impact of financial education, LoC, and spiritual variables on FB. External factors also influence financial decision outcomes.

Santoso and Sari (2021) studied that FB assessed the role of Financial Literacy using a questionnaire with 89 respondents. Partial least squares analysis showed significant positive relationships between FL, attitude, and FB. Baptista and Dewi (2021) analyzed FL and knowledge among the working-age population. They investigated the impact of financial attitude, FL, and LoC on financial management behavior. The findings revealed that both financial attitude and literacy have a significant influence on FB and decision-making. Parmitasari et al. (2020) investigated LoC and FL significantly influence FB in university students, as evidenced by a regression analysis of a primary sample of 246 participants.

Rehman, Saeed, and Younas (2024) investigate how financial literacy affects Pakistani people's investing choices while taking religious sentiments into account. Their study shows that objectiveoriented investing behaviour is significantly influenced by financial self-efficacy. Khan (2024) in this study aims to investigate how digitalisation affected Pakistan's banking sector following the COVID-19 pandemic, specifically the trend towards using digital banking services, changes in consumer behaviour, and issues that banking institutions faced as they underwent digital transformation.

Theoretical Framework

The theoretical framework of this study is based on established theories that explain the relationship between financial literacy, decision-making, and economic behavior. The following theories support the model:

Behavioral Decision Theory

Theory Overview:
This theory emphasises how emotions and cognitive biases affect financial decisions, building on the groundwork of classic decision-making theories while incorporating psychological insights. In terms of financial literacy, it implies that biases like mental accounting, loss aversion, and overconfidence frequently cause people to make incorrect financial

decisions.Even when they have the information to make better financial decisions, people in developing nations who lack financial literacy may make bad ones, according to this notion. It draws attention to how psychological aspects influence financial behaviour.

Financial Capability Model (2021) Theory Overview:

This model builds on the idea of financial literacy by emphasising not only knowledge but also people's confidence, behaviour, and ability to apply financial knowledge to real-life situations. It includes aspects of financial well-being and resilience in unpredictable economic environments. It emphasizes how important it is to understand financial concepts and be able to use them to make wise financial decisions, which is especially important in developing economies.

Digital Financial Literacy Model Theory Overview:

Digital financial literacy through this model describes the ability people possess to handle their finances through electronic platforms and tools. The model explains multiple financial topics including digital investments with mobile money technology as well as internet banking and proper financial technology usage. The modern world demands basic digital financial skills since digital financial options are growing prevalent across nations at different development stages. Young people who use digital financial platforms across emerging economies find digital financial literacy essential because they depend on these systems and mobile money.

Hypotheses Development

Financial Literacy (FL) and Financial Behavior (FB)
Adriani (2021) analyzed the role of FL in accessing relevant information for decision making, aiming to reduce systematic errors in heuristic decision-making approaches. This, as part of formal heuristic models, aids in achieving optimal decision-making processes. Consequently, Santoso and Sari (2021) highlighted significance of FL and attitude in relation to FB, emphasizing their positive impact. In support of above two researches, Baptista and Dewi (2021) explores the relationship of financial knowledge, attitude, literacy, and LoC on financial management behavior. Results witnessed significant impact of financial attitude and literacy on financial behavior and decisionmaking, whereas, Parmitasari et al. (2020) did an empirical study which witnessed significant impact of LoC and FL on FB, particularly among university students.

In accordance with above mentioned studies, following hypothesis of the research is evolved.

H1: financial literacy has significant and direct impact on financial behavior of an individual investor in Financial Sector of the Pakistan.

Arifin and Widjaya (2022) analyzed impact of financial knowledge, experience, and ILoC on FB. The results demonstrated significant positive effects of financial experience, knowledge, and ILoC on financial decisions and behaviors, Handoyo et al. (2021) investigated influence of financial knowledge, experience, and ILoC on investment decisions among non-depository investors. The results revealed that ILoC mediated the relationship between FL and financial management behavior, indicating that it plays a significant role in shaping investment decisions. Whereas, Aryani et al. (2021) investigated financial management behavior of career women, considering financial knowledge and ILoC as moderators. Results reveal significant positive effects of LoC and financial knowledge on FB.

In relation with above literature we came up with the second hypothesis of our research, proposed as follows.

H2: Internal locus of control has significant and moderated impact between financial literacy and financial behavior.

Sam et al. (2022) explains that ELoC refers to situations beyond an individual's control, excluding their ILoC. Whereas, Purnamawati (2021) investigated the impact of financial education and ELoC on FB. Results reveal significant influences of financial education, ELoC, and spiritual variables on FB. The study also emphasizes the role of external factors in financial decision outcomes and Adriani (2021) studied that FL exposes a crucial role in developing the skills needed to analyze external factors, enabling individuals to better understand and forecast external elements within their decision-making process. In comparison, Quantitative study shows significant role of FL and moderating influence of ILoC and ELoC on FB (Ruiz & Pergelova, 2015).

Above represented foundation gave a ball park space to stand our third research hypothesis which is as below.

H3: External locus of control has significant and moderated impact between financial literacy and financial behavior.

Conceptual Framework

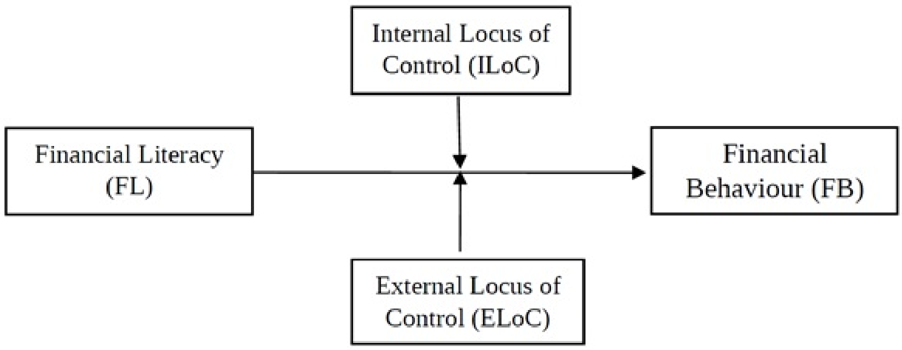

Figure 1: Conceptual Framework

Research Methodology

Adequate research methodology with meaningful procedures leads to reliable and authentic findings which can be generalized and useful for stakeholder. Albeit, we are interested to test theory of financial literacy by adopting aforesaid variables and this strategy motivate us to use deductive research approach. This research investigates direct and moderating impacts of LoC on FL and FB, therefore this study is an exploratory research.

The present study employs established research methodologies to establish validity together with relevance in its design. Self-reported surveys have proven effective for financial behavior measurement according to the findings of Adriani (2021) and Ameliawati and Setiyani (2018) so researchers can use this method in their study. Locus of control serves as a moderation factor in financial decision-making which is substantiated by Cobb-Clark et al. (2016) and Gunawan et al. (2023). Research articles from Baptista and Dewi (2021) demonstrate that financial literacy operates as a mediator. The relationship between financial behavior and financial literacy is well established. The research selects Structural Equation Modeling (SEM) because it effectively analyzes complex relationships according to the validations of Hair et al. (2013) and Hair et al. (2018). The chosen methodology receives additional strength from previous studies which support its validity and demonstrate increased research robustness.

Dataset, Research Procedure and Technique

This research is articulated in three segments including data collection, variable measurement and result analysis. Research questionnaire is designed based on existing literature and circulated for data collection. The questionnaire is split up into two segments, segment 1 refers to demographic information whereas segment 2 is comprised on research variables and pertaining constructs to it. We used Likert scale ranging from 1 to 5 (Strong Disagree to Strongly Agree). We have collected data through adopted instrument (based on developed scales) and used convenience sampling technique. Our target population was banking customers in Karachi; hence estimating exact population size of all banking customers in such massive city is very difficult because commercial banks do not disclose their clientele due to confidentiality and other regulatory issues. Moreover, Karachi is mini Pakistan and being the largest city of the country we can generalize our finding in Pakistan.

To define sample size for any research, the size of population must be estimated (Hair and Black, 2010). According to the book of "Multivariate Data Analysis by Joseph F.Hair" 200 sample collection is enough for data normality. We have collected total of 198 questionnaires from targeted population and later we sensitized only useable questionnaire (Discard 6 questionnaires due to outliers, we get 192 cleaned questionnaires). Furthermore, we also considered "Danielsoper Calculator" (Soper, 2021) for Structure Equation Modeling (SEM) for sample size adequacy and thresholds to comply with SEM testing. Having done with data collection we used PLS-SEM to perform statistical analysis. Last not least, authors have considered ethical consideration and confidentiality of personal information of respondents, collected data is only used for research purpose and authors had extreme care of ethical standards in research community.

Ethical Issues in the Consent Procedure

Ethical issues were given top priority in this investigation, and conventional ethical criteria were followed throughout. An informed consent form outlining the study's nature and objectives, the voluntary nature of participation, and the participants' freedom to withdraw at any moment without facing any repercussions was given to each subject prior to their involvement. Participants received assurances that their answers would be anonymous and confidential. The appropriate authority granted ethical approval to guarantee adherence to moral principles. These protocols were created to preserve the study's integrity and safeguard the participants' rights.

Results and Analysis

Pilot Study

Variable Name	N Items	Cronbach's Alpha
Financial Literacy	5	0.749
Financial Behavior	5	0.809
Internal Locus of Control	5	0.874
External Locus of Control	5	0.896

Table 1: Pilot Study

Above table illustrates results of a pilot study, value of Cronbach's Alpha remained in between 0.74 to 0.89 which is considerably adequate for preforming further analysis (Hair et al., 2013). We engaged 50 respondents for this pilot study having 5 item questions for each variable. Later on, we circulated our research Performa to target audience and start collecting data.

Data Screening

Preliminarily, we used Z-score (Univariate Outliers - UVO) function to detect outliers in the obtained dataset, we observed 6 of received questionnaires had outliers which are discarded immediately after the detection (Threshold of z-score value is -3.29 and +3.29 in any value exceed than threshold so it indicates chances of outliers), we did not find any missing value in the dataset. Moreover, we used Mahalanobis Distance (Multivariate Outliers - MVO) as suggested by Hair et al. (2019) and did not find any Multivariate Outliers in the dataset (Threshold of MVO is (D2) < 0.001).

Table 2: Demographic Profile of Respondents

Demographics	Frequency	%
Respondent's Gender		
Male	123	64.0
Female	69	36.0
Total	192	100.0
Respondent's Age		
Less than 25 years	38	19.8
25–35 years	119	62.0
36–45 years	28	14.6
Above 45 years	7	3.6
Total	192	100.0
Respondent's Education		
Undergraduate	39	20.3
Graduate	71	37.0
Masters	80	41.7
PhD	2	1.0
Total	192	100.0
Respondent's Income		
Less than 50,000	81	42.2
50,001–70,000	36	18.8
70,001–90,000	21	10.9
More than 90,000	54	28.1
Total	192	100.0

Note: Demographic defines the structure of population; researches based on the psychological factors keep adequate weightages of demographics analysis.

Measurement Model

The tables provided below present the results of important statistical tests, including factor loading, Cronbach's Alpha, rho A, composite reliability, and Average Variance Extracted (AVE) for latent variables, along with their respective constructs. Outer values latent variables remained higher than prescribed benchmarks (> 0.7) by Hair et al. (2018). FB1 to FB5 (Financial Behavior) values remained in the ranges of 0.82 to 0.087, whereas outer loading values for FL1 to FL5 (Financial Literacy) dented around 0.80 to 0.86. Moreover, outer loadings of LCI1 to LCI5 (Internal Locus of Control) stood around 0.83 to 0.92, hence overall values of out loadings claimed a safe zone and need not any changes.

We employed Variance Inflationary Factor (VIF) to detect Multicollinearity in the model. Prescribed ranges of VIF is between 1 to 10 to reject existence of Multicollinearity. In accordance with the below mentioned tables, VIF values for every variable remained higher than 1 which indicate that there is no multicollinearity issue in the model.

The internal reliability of the model was assessed using Cronbach's Alpha, composite reliability, and rho A. The "Model Measurement" table indicates that the reliability and rho A scores are above 0.7, demonstrating satisfactory internal reliability. Additionally, the composite reliability values surpass both Cronbach's Alpha and rho A, affirming the strong internal reliability of the research. Hair et al. (2017) suggested the ranges of Cronbach's Alpha and rho A should be equal to greater than 0.7 and value of composite reliability must be greater than both.

To test internal validity, we used Average Variance Extracted (AVE) as suggested by Hair et al. (2018). We observed that values of each considered variable is higher than 0.50 (more than benchmark) which stamps accuracy of model's internal validity.

Table 3: Measurement Model

Latent Variables	Items	Outer Loading	VIF	Cronbach's Alpha	rho_A	CR	AVE
	FB1	0.830	2.186				
	FB2	0.859	2.526				
FB	FB3	0.873	2.637	0.902	0.904	0.927	0.719
	FB4	0.853	2.383				
	FB5	0.823	2.138				
	FL1	0.806	2.183				
	FL2	0.854	2.602				
FL	FL3	0.863	2.658	0.899	0.905	0.925	0.711
	FL4	0.841	2.334				
	FL5	0.850	2.406				
	LCE1	0.896	3.359				
	LCE2	0.860	2.848				
ELoC	LCE3	0.886	3.404	0.936	0.944	0.951	0.795
	LCE4	0.913	3.865				
	LCE5	0.903	3.780				
	LCI1	0.834	2.374				
	LCI2	0.863	2.686				
ILoC	LCI3	0.855	2.614	0.924	0.929	0.943	0.767
	LCI4	0.902	3.811				
	LCI5	0.922	4.555				

Discriminant Validity

According to Campbell and Fiske (1959), discriminant validity is the technique to assess un-relatedness of the constructs. There are two renowned methods to assess discriminant validity, (1) Fornell and Larcker (1981) criterion and Heterotrait-Monotrait Ratio (HTMT) (Henseler et al., 2015). FLC used the square root of AVE to assess discriminant validity, requiring higher correlations with respective coefficients than other constructs in the model for supporting discernment validity whereas Heterotrait Monotrait Ratio (HTMT)

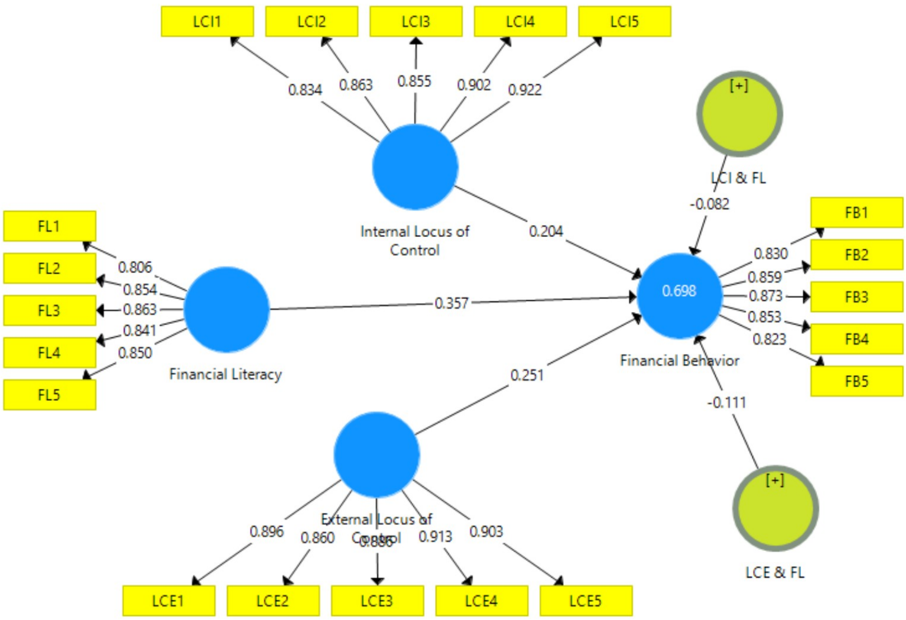

Figure 2: PLS-SEM Algorithm

technique assesses discernment validity, with values required to be above 0.5 and below 0.9. Generated results for tested compliances with the benchmarks/criteria of both tests having values under the ranges which witnessed considerable discriminant validity. we have also estimated cross loading of each construct, cross loading is complimentary testing with discriminant validity, we found no discrepancy in cross loading of constructs.

Table 4: Discriminant Validity: Fornell-Larcker Criterion (FLC) and Heterotrait-Monotrait Ratio (HTMT)

Variables	Fornell-Larcker Criterion (FLC)				HTMT			
	LCE	FB	FL	LCI	LCE	FB	FL	LCI
ELoC	0.892							
FB	0.581	0.848			0.622			
FL	0.483	0.763	0.843		0.516	0.839		
ILoC	0.557	0.694	0.699	0.876	0.599	0.755	0.765	

Table 5: Cross Loadings

Latent Variables	Items	LCE	FB	FL	LCI
FB	FB1	0.464	0.830	0.635	0.533
	FB2	0.507	0.859	0.634	0.569
	FB3	0.538	0.873	0.690	0.666
	FB4	0.509	0.853	0.658	0.605
	FB5	0.436	0.823	0.611	0.559
FL	FL1	0.358	0.546	0.806	0.569
	FL2	0.410	0.636	0.854	0.592
	FL3	0.408	0.642	0.863	0.551
	FL4	0.404	0.620	0.841	0.650
	FL5	0.443	0.743	0.850	0.588
ELoC	LCE1	0.896	0.573	0.458	0.506
	LCE2	0.860	0.487	0.397	0.444
	LCE3	0.886	0.407	0.321	0.448
	LCE4	0.913	0.574	0.485	0.515
	LCE5	0.903	0.511	0.458	0.554
ILoC	LCI1	0.533	0.548	0.551	0.834
	LCI2	0.479	0.590	0.594	0.863
	LCI3	0.502	0.568	0.541	0.855
	LCI4	0.468	0.664	0.692	0.902
	LCI5	0.467	0.656	0.666	0.922

Table 6: Path Analysis Results

Paths	Original Sample (O)	Sample Mean (M)	ST. DEV.	t-Stat (—O/STDEV—)	p Values
ELoC → FB	0.250	0.251	0.058	4.257	0.000
FL → FB	0.356	0.369	0.090	3.948	0.000
ILoC → FB	0.204	0.195	0.097	2.088	0.037
ELoC & FL → FB	-0.110	-0.110	0.071	1.551	0.121
ILoC & FL → FB	-0.081	-0.079	0.064	1.259	0.208

Above table are the final results of this research, results dented key findings by exploring the impact of independent variables on dependent with direct and indirect effects. Hence, the table showcased that ELoC, FL and ILoC exposed direct and significant impact of FB because p-values of these variables is less than 0.05. Going forward, all of these variable exhibited positive signs, meaning that if ELoC (factors that can't be controlled by individual) impact financial behavior such as subdued economic conditions, political turmoil and inflation rate fluctuations impact directly and positively on FB of and individual. In contrast, ILoC (Individual is responsible himself for winning or losing) placed direct and positive impact on FB means that heuristic and herding may have direct impact on FB of individual. FL explains the ability and willingness to take sound decision in the light of obtained knowledge, accessible information and analysis of information. Meaning that, FB of an individual is dependent on the level knowledge and its understanding of an individual. In next, we verify moderating effect of ILoC and ELoC in between FL and FB. we observed there is no moderating impact of ILoC and ELoC in between FL and FB.

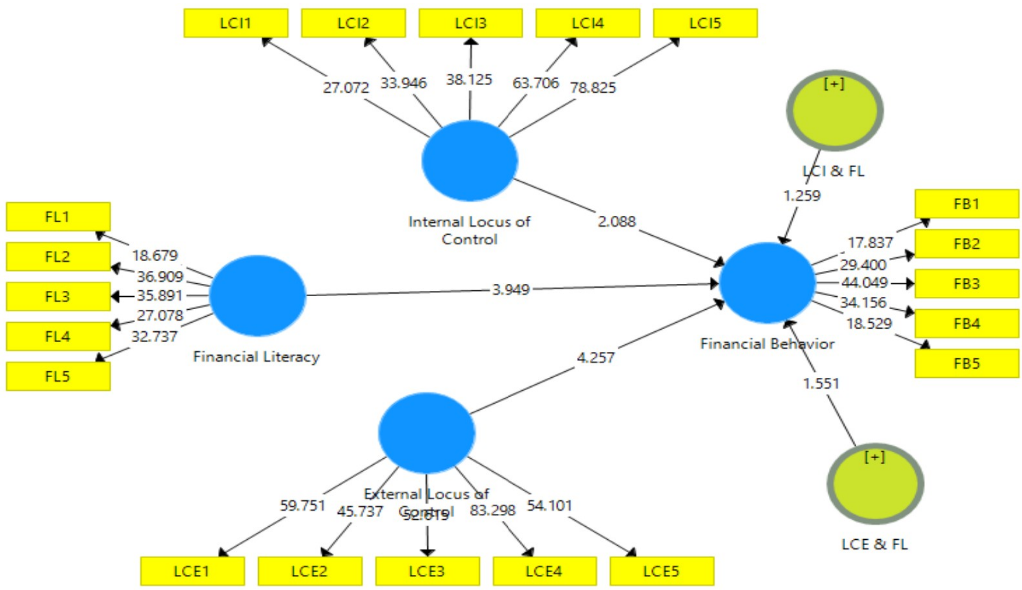

Figure 3: Bootstrapping Model

Table 7: Predictive Power and Relevance

Variable	R Square	R Square Adjusted	Chi-Square
FB	0.697	0.689	427.024

Above table explains explanation of independent variables to dependent variables, adjusted R^2 is around 0.689 or 68.90% means that all independent variables collectively explaining the dependent variables 68.90% and 31.10% is unexplained variation which could by some other factors which are not taken in this study.

Discussion and Conclusion

Discussion

Reported results witnessed that ILoC, ELoC and FL had significant and positive impact on FB. findings of ELoC with FB is aligned with the findings of Adriani (2021) who noticed the same whereas Purnamawati et al. (2020) reported both positive and negative situation in individuals while making financial decisions. The ILoC absorbs the ELoC based on experiences, while FL improves the gap between them in financial decision-making activities (Sam et al., 2022; Ameliawati and Setiyani, 2018). Going forward, FL is one of the key component which enhances ILoC and FB of an individual, therefore our findings dented positive and significant impact of FL on FB which is aligned with Baptista and Dewi (2021); Santoso and Sari (2021). ILoC refers to sense of responsibility of an individual towards failure and success, hence reported results exhibits positive and significant impact of ILoC on FB which is supported by Aryani et al. (2021); Arifin and Widjaya (2022).

Conclusion

This deductive quantitative study aimed to investigate the impact of FL on FB, with a focus on individuals from Pakistan. Convenience sampling was used, with a sample size of 192. The study found significant relationships between ELoC, FL, ILoC, and FB. However, the moderating effects of ILoC & ELoC were not significant. Findings of the research is aligned with above mentioned studies, however this study also tested theory of financial literacy by reported positive impact of FL on FB of an individual. The impact of FL on FB, with the moderating role of ILoC and ELoC, has managerial implications for the banking sector in Pakistan. These include developing customized financial education programs, providing interactive financial tools, collaborating with educational institutions, offering personalized financial advisory services, and forming partnerships to promote financial literacy initiatives. Future research can extend the study longitudinally, incorporating psychological factors and investigating the moderating role of demographics within the banking sector in Pakistan.

Theoretical and Managerial Implications

Theoretical Implications

We address our study's theoretical contributions in this section. The results present fresh insights into the connection between locus of control, financial behaviour, and financial literacy. In particular, we build on current theories by showing how locus of control mitigates the influence of financial literacy on financial judgement. This builds on earlier studies by providing a more sophisticated understanding of how people's internal control beliefs can affect their financial decisions. Future study directions are also suggested by the theoretical ramifications, especially with regard to analysing cultural variations and incorporating additional psychological elements into models of financial behaviour.

Managerial Implications

This section demonstrates how the research outcomes benefit both managers and legislators in their operations. Better financial decision-making emerges through financial education when paired with treatments that concentrate on locus of control according to the research findings. Program managers at financial institutions can use these research findings to establish educational initiatives for finance that address numerous personality and psychological types. The findings should be used by governments to enhance their financial literacy programs so they produce individuals who both possess knowledge and exhibit the capacity to make secure financial decisions. The research demonstrates that financial interventions must include personalization to address psychological factors especially the locus of control when developing interventions.

Implications for Policy

The study's conclusions have a number of significant policy ramifications for encouraging people to behave more responsibly with their money. The findings can be used by policymakers to create focused financial education initiatives that improve financial literacy, especially for marginalised groups. It may be possible to customise interventions to enhance financial outcomes by incorporating psychological elements like locus of control into financial decision-making models. The study also emphasises how crucial it is to incorporate behavioural insights into public policies and financial laws in order to promote longer-term economic stability and more responsible financial behaviour.

References

Adriani, J. (2021). Factors affecting financial behaviors. *International Journal of Review Management Business and Entrepreneurship (RMBE)*, 1(2):191–204.

Ameliawati, M. and Setiyani, R. (2018). The influence of financial attitude, financial socialization, and financial experience to financial management behavior with financial literacy as the mediation variable. *KnE Social Sciences*, pages 811–832.

Arifin, A. Z. and Widjaya, I. (2022). The effect of financial knowledge, financial experience, and locus of control towards investment decision of non-depository investors. In *3rd Tarumanagara International Conference on the Applications of Social Sciences and Humanities (TICASH 2021)*, pages 761–766. Atlantis Press.

Aryani, R., Khaddafi, M., and Naz'aina, N. (2021). The effect of financial knowledge and personal net income on the financial behavior of malikussaleh university employees with locus of control as moderating variables. *International Journal of Economic, Business, Accounting, Agriculture Management and Sharia Administration (IJEBAS)*, 1(1):1–13.

Baptista, S. M. J. and Dewi, A. S. (2021). The influence of financial attitude, financial literacy, and locus of control on financial management behavior. *International Journal of Social Science and Business*, 5(1):93–98.

Campbell, D. T. and Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56(2):81.

Cobb-Clark, D. A., Kassenboehmer, S. C., and Sinning, M. G. (2016). Locus of control and savings. *Journal of Banking & Finance*, 73:113–130.

Fornell, C. and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1):39–50.

Gunawan, A., Pohan, M., Wahyuni, S. F., and Sari, M. (2023). Factors affecting financial management behavior of paylater users in indonesia: Examining the moderating role of locus of control. *Investment Management and Financial Innovations*, 20(4):171–181.

Hadianto, B. and Mariana, A. (2023). Gender, financial literacy, internal control locus, and economic well-being: The employee viewpoint. *Owner: Riset dan Jurnal Akuntansi*, 7(4):3621–3629.

Hair, J. F. and Black, W. C. (2010). *Multivariate Data Analysis*. Pearson Prentice Hall, 7th edition.

Hair, J. F., Black, W. C., Babin, B. J., and Anderson, R. E. (2018). *Multivariate Data Analysis: A Global Perspective*. Pearson Education, 8th edition.

Hair, J. F., Ringle, C. M., and Sarstedt, M. (2013). Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance. *Long Range Planning*, 46(1-2):1–12.

Hair, J. F., Risher, J. J., Sarstedt, M., and Ringle, C. M. (2019). When to use and how to report the results of pls-sem. *European Business Review*, 31(1):2–24.

Handoyo, S. E., Setijaningsih, H. T., and Valencia, Y. (2021). Locus of control as an intervening variable towards the behavior of financial management. In *Ninth International Conference on Entrepreneurship and Business Management (ICEBM 2020)*, pages 311–316. Atlantis Press.

Hardini, H. T., Pratiwi, V., and Bahtiari, M. D. (2023). Learning finance, financial literacy and financial technology as predictors of student financial behavior in the covid-19 pandemic era. In *Unima International Conference on Social Sciences and Humanities (UNICSSH 2022)*, pages 546–552. Atlantis Press.

Henseler, J., Ringle, C. M., and Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43:115–135.

Hidayati, A. R. and Nugroho, D. S. (2023). Effect of financial literacy and fintech payment of financial management behavior with internal locus of control as moderator. *Journal of Business Management and Economic Development*, 1(02):221–229.

Huda, N. et al. (2023). The influence of financial literacy and locus of control on financial management behavior in micro, small and medium enterprises in bima city. *JIM UPB (Jurnal Ilmiah Manajemen Universitas Putera Batam)*, 11(1):164–173.

Iram, T., Bilal, A. R., and Ahmad, Z. (2023). Investigating the mediating role of financial literacy on the relationship between women entrepreneurs' behavioral biases and investment decision making. *Gadjah Mada International Journal of Business*, 25(1):93–118.

Kahneman, D. and Tversky, A. (1979). On the interpretation of intuitive probability: A reply to jonathan cohen. *Cognition*, 7:409–411.

Khan, M. (2024). Impact of digitalization after covid-19 on banking sectors in pakistan. *Journal of Banking and Finance*. Forthcoming.

Khawar, S. and Sarwar, A. (2021). Financial literacy and financial behavior with the mediating effect of family financial socialization in the financial institutions of lahore, pakistan. *Future Business Journal*, 7(1):1–11.

Kumar, P., Islam, M. A., Pillai, R., and Sharif, T. (2023). Analysing the behavioural, psychological, and demographic determinants of financial decision making of household investors. *Heliyon*, page e13085.

Lusardi, A. and Mitchell, O. S. (2011). Financial literacy and planning: Implications for retirement wellbeing. Technical Report w17078, National Bureau of Economic Research.

Lyons, A., Chang, Y., and Scherpf, E. (2006). Translating financial education into behavior change for low-income populations. *Journal of Financial Counseling and Planning*, 17(2):27–45.

Malik, M. A. R., Butt, A. N., and Choi, J. N. (2015). Rewards and employee creative performance: Moderating effects of creative self-efficacy, reward importance, and locus of control. *Journal of Organizational Behavior*, 36(1):59–74.

Meriam, A., Angreyani, A. D., Kurniawan, A. W., Musa, M., and Mustafa, M. (2023). Casino royale: A comparative analysis of financial literacy and locus of control on smes' financial behavior. *South Asian Journal of Social Studies and Economics*, 20(3):195–202.

Mutlu, and Özer, G. (2021). The moderator effect of financial literacy on the relationship between locus of control and financial behavior. *Kybernetes*, 51(3):1114–1126.

Parmitasari, R. D. A., Kara, M., Bulutoding, L., Alwi, Z., and Sriwijaya, M. (2020). Financial behavior of indonesian moslem students scholarship recipients: The role of locus of control and financial knowledge. *International Journal of Advanced Engineering Research and Science (IJAERS)*, 7(4):281–292.

Perry, V. G. and Morris, M. D. (2005). Who is in control? the role of self-perception, knowledge, and income in explaining consumer financial behavior. *Journal of Consumer Affairs*, 39(2):299–313.

Pg Md Salleh, A. M. H. A. (2015). A comparison on financial literacy between welfare recipients and non-welfare recipients in brunei. *International Journal of Social Economics*, 42(7):598–613.

Purnamawati, I. G. A. (2021). Financial education, psychological and spiritual on financial behavior. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, 12(12):2932–2944.

Purnamawati, I. G. A., Yuniarta, G. A., Sulindawati, N. L. G. E., and Astria, P. R. (2020). Financial behavior of micro business women in management and well-being improvement. In *5th International Conference on Tourism, Economics, Accounting, Management and Social Science (TEAMS 2020)*, pages 16–23. Atlantis Press.

Rahmawati, U. and Marcella, E. (2023). Locus of control, financial knowledge, financial attitude, financial self-efficacy, and social economic status as antecedents of financial management behavior. *Journal of Management and Business Insight*, 1(1):62–72.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, 80(1):1–28.

Sabri, M. F., Anthony, M., Law, S. H., Rahim, H. A., Burhan, N. A. S., and Ithnin, M. (2023). Impact of financial behaviour on financial well-being: evidence among young adults in malaysia. *Journal of Financial Services Marketing*.

Sam, P. A., Frimpong, S., and Kendie, S. (2022). Personal finance behaviour: a reasoned action approach. *International Journal of Social Economics*, 49(12):1797–1812.

Santoso, A. and Sari, E. P. (2021). The role of financial literacy as one of the influences of financial behavior. *Jurnal Manajemen*, 25(3):415–430.

Servon, L. J. and Kaestner, R. (2008). Consumer financial literacy and the impact of online banking on the financial behavior of lower-income bank customers. *Journal of Consumer Affairs*, 42(2):271–305.

Setianingsih, D., Dewi, M., and Chanda, A. (2022). The effect of financial knowledge, financial planning, internal locus of control, and financial self-efficacy on financial management behaviour: A case study of smes grocery stores. *Jurnal Samudra Ekonomika*, 6(1):19–30.

Song, C. L., Pan, D., Ayub, A., and Cai, B. (2023). The interplay between financial literacy, financial risk tolerance, and financial behaviour: The moderator effect of emotional intelligence. *Psychology Research and Behavior Management*, 16:535–548.

Soper, D. S. (2021). A-priori sample size calculator for structural equation models [software]. https://www.danielsoper.com/statcalc. Accessed: 2023-05-25.

Tiftik, E., Mahmood, K., and Zhou, J. (2019). Global debt monitor slowdown in 2018–pause or trend? https://www.iif.com/publications/global-debt-monitor. Accessed: 2023-05-25.