

Financial Literacy as a Life-Saver: Moderating the Contribution of Behavioral Biases towards Investment Decisions

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Abstract

The assumption of investor rationality has been central to developing an understanding of financial markets and decision outcomes. But the formation and consequent burst of the tech-stock bubble changed the paradigm and shifted towards the behavioral interruption aspect of investor psychology. The study aimed to investigate the relationship of two heuristics and one emotional bias with financial decisions and the moderating effect of financial literacy on the said relationship. Primary data is gathered through a questionnaire from 208 clients of national savings. A moderation analysis was done and the effect of biases on the financial decisions was found significant enough. Furthermore, financial literacy moderates this relationship positively only for heuristics but no moderation found for self-control. The policymakers can design their financial instruments and strategies by keeping in view the implication of biases on investor's decision. Moreover, periodic financial literacy sessions can be arranged to create awareness among investors and advisors

Key Words

Financial Decisions,
Financial Literacy,
Anchoring Bias, Self-
Control, Availability Bias

Introduction

The history of economics and finance has gone through various evolutionary stages. It is considered that individual investor, investment managers, and group investors made their decision after performing comprehensive and detailed technical analysis, fundamental analysis along across the board judgments. The subprime mortgage crisis of 2008 and the Asian financial crisis is also known as 'Asian Contagion' that resulted in a significant market drop in most of the prominent stock markets. During these periods, the most surprising fact was the extreme fluctuations among the markets irrespective of the point that they are considered as efficient. This caught the attention of researchers who started noticing other forces accountable for transmitting such a drastic turmoil in the market. Resultant standard finance techniques and models were found inadequate to understand this complex happening and other factors were given importance that caused anomalies in the so-called efficient markets.

Before the emergence of behavioral finance, it was understood that investors as human beings are rational wealth maximizers, who are immune to emotions and extraneous factors. But then in the 1980s, Daniel Kahneman and Amos Tversky two cognitive psychologists, who in the upcoming years were known as the major contributors of behavioral finance, propounded that human beings are not behaving rationally and are exposed to various biases. They conducted over 200 experiments to conclude that investors are making satisfying decisions and not optimal ones because of their bounded rationality.

Bounded rationality was coined by March & Simon (1958) pointing out that rationality is bounded in human as they exercise mental shortcuts in their decision making that lead them towards suboptimal judgments. Psychology termed these errors as judgmental shortcuts named "heuristics". These heuristics are simple rules that only consider one side of the complicated problem while ignoring the rest. These subjective shortcuts result in continuous diversion from rationale, probability, and logic. Babajide & Adetiloye (2012), and Bashir et al. (2013), found in their empirical work that investors are not as rational as they are claimed in the theories and conventional financial models. They found investors as normal contrary to standard finance where they were regarded as 'rational' economic beings with optimal decisions.

Heuristics can be explained as stereotyping, rule of thumb or intuitive judgment that helps in streamlining the decision making in complicated and ambiguous conditions (Ritter, 2003). Moreover, it makes the job of probability analysis and value prediction easy, when one has to make some important judgments (Kahneman & Tversky, 1974). According to Waweru et al (2008), these heuristics play a very helpful role when one has to take a decision on the spot and very little time is available for planning, but on the other hand, these urgently taken decisions follow biases. Kahneman and Tversky (1974) were pioneers in identifying three heuristics: availability, anchoring, and representativeness. When an individual takes decision-based on readily available and easily retrievable information then this leads towards availability bias instead of doing a comprehensive analysis. Investors tend to do so because they find it more convenient and easy to recollect information recently stored in their minds (Lusardi & Mitchell, 2014).

Tversky & Kahnemann (1974) and Girard & Sinha (2008) defined availability bias as a tendency to make decisions while focusing on basis of facts and information readily available to human mind instead of focusing on the entire situation. Sometimes investors even change their decision of financial choices on the basis of available information and those investment decisions are influenced negatively due to availability of irrelevant information (Subramaniam, & Velnampy, 2017). On the other hand, another very important bias that distorts the rationality of decision is self-control bias. Pompian (2006) defined it as an emotional behavioural bias that arises in the result of the conflict between the desires of people and their inability to achieve those desires because of the absence of self-discipline. People high in self-control make strong plans regarding their financial decision and strictly comply with those plans and decisions and thus do not suffer future losses and lack of money. Whereas people low in self-control cannot control their extra spending due to lack of self-discipline and commitment to decisions and therefore are always facing a lack of funds and resources.

Anchoring is a cognitive bias and judgmental shortcut affecting ways of perceiving possibilities so buyers practicing it repeatedly feel lost due to random prices, ultimately sticking to particular numbers in various decision situations. Islam (2012) defined anchoring bias as a human tendency of depending entirely on the initial part of information or evidence (anchor) in decisions. This attitude disrupts decisions that are entirely based on historical experiences, previous information while ignoring the current surroundings of the marketplace (Kannadhasan and Nandagopal, 2010)).

These biases and heuristics can be moderated, controlled and even somewhere adapted to if financial literacy is imparted to people. Johnson, Soderberg & Wilhelmsson (2016) defined financial literacy as the ability to make informed financial decisions based on proper, needed knowledge about the financial instrument, investment opportunities, and markets. The World Bank (2008) reported that financial literacy plays a vital role in enhancing efficiency and economic services quality in financial markets like that way it enhanced the wellbeing of governments, MNEs, individuals, financial institutions and society overall. The current study has analyzed the contribution of two heuristics and one emotional bias i.e. self-control, anchoring and availability towards financial decisions. Furthermore, the moderating impact of financial literacy is also examined on the contribution of behavioral biases towards financial decisions. The findings of the study will be useful for a variety of economic agents in understanding the significance of financial awareness and its importance in developing sensible investment decisions. So, investors by being alert and informed about their biases can refrain themselves from becoming a victim of irrationality. These include individuals, investors, fund managers and advisors, investment analysts and planners, researchers, financial institutions, policymakers and private business owners for current and future investments and investment plans (Cude, et al. 2006).

Literature Review

Heuristics and Investment Decisions

Bakar and Yi (2016) studied a sample of 200 diverse active investors between 18-60 years involved in Malaysian stock trading to investigate overconfidence, conservatism, availability and conservatism bias. They documented an association between biases and financial decision except for conservatism that had a negative contribution. However, herding was not detected in the Malaysian market but the dependence of psychological factors was found gender-dependent.

Khan, Naz, Qureshi & Ghafoor (2017) selected all the three heuristics to analyze 300 active investor's preferences across Malaysia and Pakistan, towards stocks in comparison to other investment classes. They detected significant inter-relationship between three heuristics and investor decisions about stock purchases, however, investors with higher education and extensive trading experience were found to be less prone to these judgmental shortcuts.

Ahmad, Hassan, Mahmood & Aslam (2016) empirically analyzed the relationship between different types of investor personality and their investment behavior along with the combination of distinctive demographic traits of individuals and availability was identified as one main factor influencing financial decisions.

H₁: Heuristics (availability & anchoring) have a strong effect on financial decisions.

Self-Control

Self-control is an important aspect of personality that pertains to the capability of a person to control own thoughts, emotions, and performance (Tangney, Baumeister & Boone, 2004). It is the degree to which an individual is able to conquer his/her initial reaction in any situation and reflects his/her level of self-control. Despite a growing appreciation that self-control is an important aspect in allowing individuals to avoid immediate appeal or temptation and achieve their goals, there is little empirical evidence that links self-control measures to economic wellbeing. Locus of control is an important variable to study as according to the argument of economists on life cycle theory, the main reason people are unsuccessful in saving is their lack of self-control (weak internal locus of control).

Making special accounts for special needs and not operating them for reasons other than the needs they were made for is self-control in a more financial sense (Thaler and Sheffrin, 1981).

H₂: Self-control bias has impact on financial decisions.

Financial Literacy

Singh and Sharma (2016) examined the role of financial literacy in investor's effective financial prudence and concluded that awareness and understanding about the financial instrument on the basis of investor's level of knowledge, commitment and interest play a pivotal and significant role in making a successful optimal investment decision and facilitate in constructing well-informed portfolios. Similarly, Ramachandran, Rajeswari & Chinnathambi (2011) found that equity investors can improve their decision-making results by becoming more knowledgeable and well-informed about decision prompting variables. They further suggested that individual investor's financial literacy and education level play a major role in modelling their perception about risk and inferred that individuals having less education hold more dubious and doubtful beliefs about their risk-perception.

Abdeldayem (2016) examined the relationship between financial knowledge, literacy and investment decisions in the Bahrain market by collecting primary data (Lusardi and Mitchell, 2014). Most investors scored below average on financial literacy, men were found more educated and knowledgeable in comparison to ladies and respondents who scored high on financial literacy were more knowledgeable about existing commercial financial instruments. Contrarily investors scoring low on financial literacy were found giving preference to guard themselves by investing in less complex financial securities with stable return base.

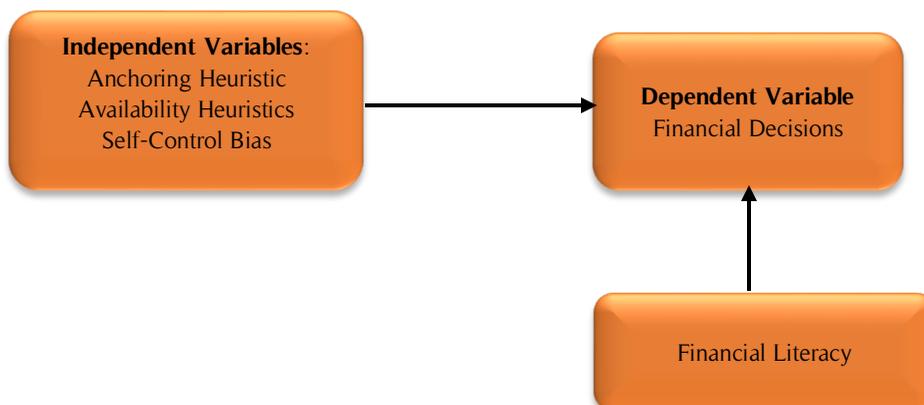
Khan, Qureshi, Naeem & Khan (2014) opined that financial literacy means the application of financial knowledge and principals while managing debt, doing financial planning, and incorporating techniques to ensure the real worth of money (Singh & Sharma, 2016).

As in the last few decades, financial markets all over the globe have expanded their operations at a great pace and introduced a wide variety of new financial products. This widening of product base has developed the need of having more sound financial information for investors to maximize their wealth in the most optimal manner.

Pompian and Longo (2005) ascribed principles for moderating behavioral biases while making fund allocation, upon a number of various reasons such as financial objectives, risk appetite and individual asset category liking for developing best practice. They suggested through various measures that one can moderate cognitive irrationalities exercised by individuals during decision making. In UAE Al-Tamimi and Khalli (2009) discovered significant contrast in the techniques preference among high and less literate investors i.e. financially educated investor consults financial reports and publications, while less literate put their faith on stockbrokers and family advice. Fachrudin And Fachrudin (2016) examined the moderating role of financial literacy on the contribution of experience and education towards a financial decision in Indonesia and analysis revealed that it strengthens the contribution.

H₃: Financial literacy moderates the relationship between behavioral biases and financial decisions.

Conceptual Framework



Methodology

Research Design

The study aimed to investigate the contribution of availability, anchoring, and self-control towards financial decisions with financial literacy as a moderator. The target population for this study is clients of national savings center from Islamabad, Rawalpindi, Lahore, Gujranwala, Gujrat, Attock and Peshawar. A sample of 250 individual national saving certificate buyers was served with questionnaires but only 208 were returned and found useful for study (83% response rate).

Data Collection Tool

Section 1 assessed demographic attributes of individual consisting of gender, marital status, qualification, age, work experience, etc. Second section contained scales of study variables including financial decision (French et al., 1993; Nye & Hillyard, 2013) as dependent variable and independent variables consisted of self-control (Tangney, Baumeister & Boone, 2004), anchoring (Gehlbach, Hunter, and Barge, 2012) and availability bias (Dwivedi et al., 2006; Bearden et al., 2001) with financial literacy as a moderating variable (OECD INFE tool kit, 2015).

Tests and Procedures

Data normality is checked by applying Kolmogorov-Smirnov and Shapiro-Wilk test whereas internal consistency and validity of the scale are measured by Cronbach alpha. Relationship between variables is measured by correlation and moderation analysis is done by using process macro (Hayes, 2014) and demographics are controlled for analysis.

Data Analysis

Demographic profile of respondents

The study focused only on the national saving certificate buyers and collected sample of 208 respondents, where male consisted of 99.5% (207 respondents) of the total sample whereas female participation was found to be only 0.48% (1 respondent), 199 were married (95.6%) and 4.33% (9) were single. Majority sample is educated i.e. 83.65% were graduates and postgraduates and only 16.35% are less qualified. Majority sample has age above 30 years i.e. 87.02% whereas 12.50% sample is less than 30 years. About 74.04% sample serves government sector, 19.23% is engaged in the private sector and only 6.73% are business owners. The majority (58.65%) has work experience between 10 to 20 years, 36.08% had the experience below 10 years and only 5.28% had experienced above 20 years.

Normality & Reliability Analysis

Data is found to be approximately normally distributed, furthermore the value of skewness and kurtosis for the variable were well within range and showing normality.

Table 1. Reliability Statistics

Variables	FD	Fin Lit	Availability	Anchoring	Self-control
Cronbach	0.88	0.71	0.70	0.89	0.75
No of Items	21	8	7	6	8

By and large, all the alpha coefficient values are above 0.70 and therefore all qualify the standards of acceptance, validity, and reliability.

Table 2. Mean, Standard Deviation and Correlations

Variable	Mean	SD	FD	FL	AVB	SCB	ANB
Financial Decisions	3.43	0.98	----	----	---	----	----
Financial Literacy	3.65	0.78	0.74	----	----	----	----
Availability Bias	3.42	0.77	0.66	0.63	----	----	----
Self-Control	3.36	0.67	0.83	0.52	0.73	----	----
Anchoring Bias	3.62	0.71	0.72	0.63	0.58	0.55	----

***Correlation is significant at 0.05 level (Where N=208)*

Overall all the statistics are normal except the largest standard deviation of financial decisions which shows that biases have major influence that leads to the deviation from the normal course of financial decisions of investors and significant correlation can be detected among all variables showing a fair amount of association.

Regression Analysis

The linear regression model is used to determine the contribution of behavioral biases and financial literacy towards financial decisions. Moreover, process macro developed by Andrew F. Hayes (2013) is used to examine the moderating effect of financial literacy on the relationship between biases and financial decisions.

Table 3. Model 1 Summary

Model 1	R	R ²	Adj R ²	SE	P-value
1	0.802 ^a	0.63	0.68	0.573	.0000

a. Predictors: (Constant), AVB, SCB, FIN_LIT, ANB

The R-squared value in the Table above shows that 63% variation in the financial decision is explained by the availability, self-control bias, anchoring bias, and financial literacy. Whereas, the remaining change is because of the other unexamined factors.

Table 4. ANOVA Summary

Model	SS	df	MS	F	Sig.
Regression	138.652	4	34.388	110.590	.000 ^b
Residual	85.173	203	.311		
Total	223.825	207			

a. Dependent Variable: Fin_D

b. Predictors: (Constant), AVB, SCB, FIN_LIT, ANB

As per the Analysis of Variance table results, all explanatory variables have a significant contribution towards financial decisions and goodness of fit is significant.

Table 5. Coefficients (Where Int-Term Represents the Interaction of Predictor & Moderator)

Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	SE	Beta		
(Constant)	-0.401	0.210		-2.18	0.050
FIN_LIT	0.540	0.065	0.45	8.061	0.000
ANB	-0.212	0.068	-0.14	-2.450	0.020

SCB	0.147	0.071	0.12	2.925	0.035
AVB	0.712	0.072	0.45	9.544	0.000
IV_1					
ANB*FIN_LIT	-0.165	0.064	-----	2.571	0.0112
IV_2					
SCB*FIN_LIT	-0.072	0.071	-----	-1.118	0.285
IV_3					
AVB*FIN_LIT	0.69	0.084	-----	9.061	0.0134

The results of Table 5 show that all predictors contribute significantly to the prediction of the outcome variable i.e. financial decisions. There is a significant positive contribution of financial literacy in financial decisions ($B=0.540$, $P<.05$) whereas anchoring has a negative effect ($B=-0.212$, $P<.05$). Moreover, self-control bias has a significant positive effect on financial decisions ($B=0.147$, $P<.05$). Similarly, the coefficient of availability bias shows that it also positively contribute to financial decisions ($B=0.712$, $P<.05$). The first two hypotheses are significantly sustained for all the three biases as all three of them prove to be interrupting the financial decisions of national saving certificate buyers.

Furthermore, the interaction results of anchoring bias with moderator financial literacy depict that financial literacy significantly moderates the contribution of anchoring and availability bias ($B=-0.165$; 0.69 , $P < .05$) and in a way minimize their intervention in financial decisions. On the contrary financial literacy proves to be insignificantly moderator for self-control bias ($B=-0.069$, $p>.05$) while making financial decisions. Thus the third hypothesis is sustained for both the heuristics and financial literacy strongly moderates their relationship with the financial decision but the hypothesis is refuted for self-control bias as no evidence found for FL moderating the relationship between self-control and financial decisions.

Discussion

The current study aimed to investigate financial literacy as a moderator for the relationship between availability, anchoring, self-control bias, and financial decisions. A strong correlation was found showing the presence of biases and the impact of financial literacy on a financial decision. Furthermore, empirical evidence of financial literacy as moderator was found for both heuristics but not in case of self-control meaning thereby that when people are low in self-control then financial literacy cannot even eliminate this bias because self-control is an emotional bias and financial literacy can moderate only cognitive biases as it constitutes of knowledge, reason, and analysis. Having knowledge of financial concepts can facilitate the economic participants reaping the benefit of national saving certificates and their profits investment in the long run. As the majority of participants possess graduate or post-graduation level education which further means that investors know the relationship of their financial and investment decision with the changes in the monetary policy rate, inflation and understand the concept of money-time relationships. Moreover, the findings of the study are in conformity with Singh and Sharma (2016).

Conclusion

Before the knowhow of behavioral finance, the investors being human were assumed to be rational individuals aiming to maximize their wealth through financial and investment decisions. Therefore, behavioral finance explained and proved human beings as normal ones, as they possess a varying degree of a multitude of emotional and cognitive biases leading to less optimal decisions. The current study concludes that heuristics that are actually judgmental shortcuts or rule of thumb used very frequently and often by all human being while making their financial and investment decisions can be moderated by imparting and inculcating financial literacy in them.

Furthermore, it is concluded that financial literacy does not moderate contribution of self-control towards financial decisions because self-control is an emotional bias and those are only adapted to and cannot be moderated. Self-control is associated with an internal locus of control and that is an entirely emotional part of human nature. The findings are consistent with numerous previous studies detecting investor's financial and investment decisions influenced and affected by financial literacy, and that way they can take benefit of new and safe future opportunities (Gilovich, Griffin & Kahneman, 2002; Lusardi & Mitchell, 2014).

Benefits for Industry & Society

Decisions pertaining to financial or investment matter are very crucial because of the involved risk and their irreversibility. As if due diligence is not considered during the financial decision making it can have severe fallouts for both individual and society at large. It has been widely observed that a great number of people form their investment and financial decision upon opinion and suggestions of other people. Therefore, to promote investment

culture by equipping investors with financial knowledge, policymakers need to design investment-related short courses for the general public, so that one can come up with a technical analysis of the market before arriving with any investment decision. Similarly, investment companies such as mutual funds and saving associations can also develop Bias-Assessment-Test battery for their managers and employees and further providing them training in order to help them overcome their biases. Brokers, advisors and fund managers can also improvise their client's cognitive decision-making skill by providing them consultancy and training.

Future Research

Future studies can replicate the study by taking up other moderating or mediating variables such as investment experience and some other demographic and personality traits, self-efficacy and locus of control, etc. Larger sample size can be studied for having better insights to develop the results which can be generalized conveniently. Furthermore, future studies can select a specific market base to check investment decision to better understand about the prevalent particular biases in every investment class separately.

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