Impact of Behavioral Biases on firm performance: Mediating Role of Entrepreneurial Innovations

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Abstract

Behavioral finance provides a better understanding and elaborates how attitude and cognitive errors affect investors as well as entrepreneurs or other decision makers. The primary objective of this study is to find those behavioral biases which impact the firm's performance and managerial, financial decision-making process through the mediating role of entrepreneurial innovations. This study predominantly focused on four biases that entrepreneurs apparently exhibit in their decisions. The survey questionnaire technique was used to collect data for research and analysis; data were collected from 109 respondents which include entrepreneurs and managers from non-financial firms of Pakistan. SEM-AMOS 21 was used to analyze the structural model. The finding shows that innovative organizations often predict the low tendency of overconfidence and usually are risk-averse in their financial decision. But the current study shows that innovative organizations can enhance the profitable performance of the firm with behavioural biases.

Keywords: entrepreneurial innovations, firm performance, cognitive biases, financial innovations, innovative organizational culture

Introduction

The traditional theory of finance explains that every individual is rational in making decisions. It is also discussed in the literature that there are many conditions where psychological factors influence the decisions.

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Thaler, (1993)suggests that rational investorcan be defined as " an individual that always modernizes his beliefs in a timely and proper manner at the time of receiving new information."Daniel, Hirshleifer, & Teoh, (2002)explain the idea about behavioralfinance that people deal with both cognitive and emotional reasons.

In behavioralfinance, we study the impacts of psychological factors, heuristics or cognitive biases on the behavior of individual and finance specialists, having significant effects on the market status (Sewell, 2010).Behavioral literature is attentive about the impacts of emotional bias on financial decisions (Souissi & Jarboui, 2018)

This research examines the impact of behavioral biases of financial and entrepreneurial innovations,existed within non-financial industry sectors of Pakistan. It is believed that entrepreneurs are able enough to foster a more productive economy (Olcombe, 2003). This study examines the relationship of behavioral biases (the illusion of control bias, over-confidence bias, self-efficacy bias, and loss aversion bias) and organizational culture with entrepreneurial innovations and overall organizational performance.

Literature Review

In the world of finance, psychological researchers discovered that at the time of decision-making people sometimes behave in an abnormal pattern. Cognitive errors and utmost emotions can become the reason of bad investment decisions of the investors(Subash, 2012).

Peter Drucker is one of the first few modern scholars who suggestthe co-relations between entrepreneurship and innovation.With the introduction of new systematic processes, entrepreneurship also opens new doors of success for business which is linked withentrepreneurial activities. (Martín-Rojas, Fernández-Pérez, & García-Sánchez, 2017).

Innovative Entrepreneurship in Pakistan

Innovation and risk-taking have traditionally been reversed in Pakistan because of the intensive role of government in the marketplace. However, up to some extent, the development of the SME sector contemplates the characteristics of entrepreneurship(Qayyum, 2014).

According to World Economic Forum (WEF) (2008) report 'Global Competitiveness Report (2008-09)', this considers innovation as one of the twelve pillars on which the country's global competitiveness index is regulated. Pakistan is overall ranked 82/134 for innovation.

Overconfidence bias

Overconfidence is a decision-making bias which alludes to the propensity of individuals to overestimate the rightness of their underlying assessments in answering moderately to difficult questions(Bazerman & Moore, 1994). According to the research, some individuals have a higher level of overconfidence than others(Houghton, 2003; Keren, 1987). Overconfidence is in probability or chance with various standard financial or economic models, which expect that belief is right on average.Previous literature on overconfidence bias addresses the effect of investors' behavior on a macro level, i.e., security trading volume, volatility, momentum, portfolio performance and speculative bubbles (Shah, Xinping, Khan, & Harjan, 2018).The relationship between overconfidence bias and entrepreneurial innovation were first proved by (Butt & Jamil, 2015). Based onthe above arguments, we suppose that

H_1: There is a significant relationship between overconfidence bias and Entrepreneurial innovations

H7: There is a mediating effect of Entrepreneurial innovations between over-confidence bias and firm performance

Loss Aversion

Ard, Sky, An, & Wartz, (1997)mentioned loss aversion as the tendency in which people become more sensitive towards loss than profit.The specialists have discovered howa financial specialist demonstrates a "break-even effect," in which they uncover theloss aversion at an expanding point within sight of past unfriendly or adverse results (Thaler, 1990). Although the average person has been found to be loss averse, that means they dominate positive outputs from losses from an irrational reference point (Smith & Desimone, 2003).

H_2: There is a significant relationship between loss aversion bias and Entrepreneurial innovations

H8: There is a mediating effect of Entrepreneurial innovations between loss aversion bias and firm performance

Self-efficacy bias

Self-efficacy bias mentions the beliefs and attitudes which are shown by the individualsin performing different activities to achievethe aseptic purpose(Smith & Fagelson, 2011). Self-efficacy also refers to the decision making process and judgment of people in a given situation who suggestaffectingthe ability to handle, emotional reactions, goals, and preserve(Dow et al., 2010).

H_3: There is a significant relationship between self-efficacy bias and Entrepreneurial innovations
H9: There is a mediating effect of Entrepreneurial innovations between self-efficacy bias and firm performance

The illusion of control bias
The illusion of control has defined as the occurrence chances of the probability of personal success, which is also higher than the probability of personal objective(Langer & Roth, 1975).The illusion of control biased people often overestimates their capabilities and actions and considers that they have full command over the uncertain scenarios (Langer & Roth, 1975). The entrepreneurs who think that their skills may protect uncertain situations and outcomes are usually less concerned with innovations in entrepreneurship (Tversky & Kahneman, 1974).
H_4: There is a significant relationship between the illusion of control bias and Firm Performance
H10: There is a mediating effect of Entrepreneurial innovations between the illusion of control bias and firm performance

Organizational culture
Many organizations provide standardized organizational culture and environment that sets the surroundings and provide the employees with a prescribed rule to dispose oftheattitude of their behavior which is proved right for employee's motivation and organization's efficiency (Rollingson, 2014).According to the previous research on organizations, any change will not provide continuous positive results excepting that culture of fully skilled and trained in their performance and coordinated to support that change. Basically, culture is the fact that actually characterize high-performing organizations from those organizations which performed not well (Jeuchter, W.M., Fisher, C. & Alford, 1998)
H_5: There is a significant relationship between organizational culture and Firm Performance
H11: There is a mediating effect of Entrepreneurial innovations between organizational culture and firm performance

Theoretical Framework

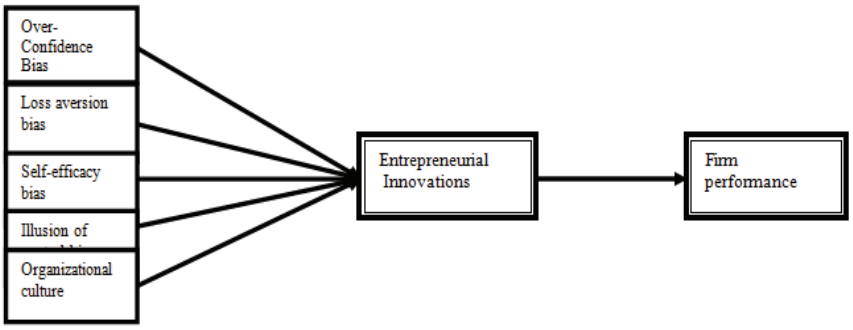

Figure 1: Conceptual Model

Methodology

The study is exploratory in nature. Purpose of this study, the unit of analysis was finance managers of the manufacturing sector of Pakistan. In the current study, a convenient and judgemental sampling technique was adopted because of constraints of time and resources. Total of120 questionnaireswas distributed out of which 109 was received back by managers. The study used an already developed questionnaire for measuring entrepreneurial innovation from the previous study, conducted by (Davis, 2006), The scale of Non-financial performance of the firm had been adopted from previous literature(Nybakk, 2012)and(Oei, 2012), organizational culture from(Denison & Neale, 1999), over-confidence bias five-item Likert scale was adopted fromMulholland, (1997), self-efficacy biasscale was adopted fromHerath et al., (2013), loss aversion bias by (Shahraki & Asmar, 2015) and illusion of control was adopted from (Bulut, 2008).

Results

Model Assessment

In the presentstudy, the path model was tested through statistical software Amos-SEM21. In behavioralbiases, researchFactor Loadinghas calculated through Confirmatory Factor Analysis (CFA) for exploratory the proposed model.

Measurement Analysis

Confirmatory Factor Analysis (CFA)

In this current study, before hypothesis testing, we have performed CFA-Confirmatory Factor Analysis to examine the construct validity among

measurable variables. Path analysis examined among entrepreneurial innovations, firm performance and organizational culture in the presence of behavioral biases. After analysis, it was determined that the illusion of control bias has not significant positive impact on entrepreneurial and financial innovations with p-value 0.147. However, self-efficacy bias has significant value with a negative impact on

Entrepreneurial innovations with p-value 0.027lead towardsanegative path betweenself-efficacy biases. Anyhow, overconfidence bias and organizational culture haveasignificantpositive impact on entrepreneurial innovations with p-value 0.007 respectively. Whereas, loss aversion bias has a significant positive impact on entrepreneurial innovations with p-value 0.011 which leads to a negative path with entrepreneurial innovations with coefficient -.23 which shows a negative relationship.

Table 1: Factor loadings of model

Constructs	Items	Loading	Cronbach's Alpha	AVE
Over-confidence	O.C.6	.82	.747	.489
	O.C.7	.76		
Self-efficacy	S.E.5	.81	.755	.580
	S.E.6	.83		
Loss aversion	L.A.3	.45	.716	.541
	L.A.5	.95		
	L.A.6	.47		
Illusion of control	I.O.C.2	.89	.689	.534
	I.O.C.3	.61		
Organizational culture	Culture3	.65	.709	.583
	Culture6	.86		
Firm performance	F.P.3	.48	.711	
	F.P.4	.48		
	F.P.6	.78		
Entrepreneurial innovation	INV1	.70	.889	
	INV2	.77		
	INV3	.71		
	INV4	.73		
	INV5	.80		
	INV6	.79		
Achieved Fit Indices				
CMIN/DF	RMSEA	IFI	TLI	CFI
1.999	0.059	.908	.0.9005	.971

We removed some questions from model due to poor loading which contains (O.C.1,O.C.2,O.C.3,O.C.4), (S.E.1,S.E.2,S.E.3,S.E.5) ,(L.A.1,L.A.2,L.A.4) , (culture1,culture2) and (F.P1,F.P5). These questions rating are below 0.45 therefore; due to better factor loading I removed all these questions.The Cronbach's Alpha for the extracted factors is shown in table 5, along with their labels and specifications. All alphas are shown above 0.70 except the illusion of control which was very close at 0.689. CMIN/DF should lie between 1 and 3, and in our table, it is good with 1.999. WhereasCFI should be more than 0.90, and in our model, it is 0.971 which the functional fitness of the model. Further, for good model fitness RMSEA should be less than 0.06 and our model represents 0.059 which indicates good model fitness value at all. Therefore, it is proved that our model is fit. The CFI is also familiar with the name ofBentler comparative fit index.If the value of CFI exceeds .90 that is regarded as acceptable, however, this index can exceed 1. NFI is known as a normed fit index which is also named as Bentler-Bonett fit index. The appropriate index varies from 0 to 1, where 1 is ideal.Moreover, Table 6 shows the factors loadings and significant levels of this proposed model.

Discriminant Validity

In order to test for convergent validity, we calculated the AVE. For all factors, the AVE was above 0.50 except the overconfidence bias. However, high AVE values were shown by an organizational culture which exposes its strong correlation with other factors of the model.

Table 2: Composite Reliability

	CR	AVE	I.O.C	O.C	S.E	L.A	CUL
I.O.C	0.703	0.534	0.578				
O.C	0.782	0.489	0.456	0.631			
S.E	0.788	0.580	0.473	0.255	0.617		
L.A	0.794	0.541	0.143	0.250	0.315	0.584	
CUL	0.819	0.583	0.374	0.388	0.216	0.325	0.695

In table 2to test for discriminant reliability, we compare the square root of the AVE to all inter-factor correlations. As mentioned in the followingtable, all diagonal values are higher than the values of AVE.We also calculated the composite reliability for each factor. In all cases of a factor, CR was above the minimum approach of 0.70, signifying the reliability in all factors

Path Coefficient and p-values

In this study, we checked the relationships between all variables by examining the path coefficient. We developed path analysis into this model by generating correlations to check the interpretation of the effects.

Table 3 Significant values and path coefficients

Research model's path	Path coefficient	S.E.	P-values
OC → INV	.216	.098	.007
SE → INV	-.025	.080	.027
LA → INV	-.152	.061	.011
IOC → INV	.080	.092	***
CUL → INV	.492	.099	.147
INV → FP	.871	.151	***

Table 3 shows the significant and non-significant levels of all variables. Organizational culture is non-significant with 0.147, which means entrepreneurial innovations are not fully correlated with the culture of any organization. Apart from this, other biases are correlated with entrepreneurial innovations as they show the significance level.It is shown in the figure that there fall positive relationships among illusion of control bias, organizational culture, entrepreneurial innovation along with a firm performance with significance values, respectively 0.11, 0.00, 0.00. There is a negative relationship, shown among self-efficacy bias and innovations with a path coefficient -0.284.

Structural model

To link the hypothesized relationship between variables we run the statistical software Amos Graphics 21, which shows the estimation of constructs of this current study.

Table 4 : Hypothesis Testing

Variables	Path coefficients	P-value	Did hypothesis support or rejected?
H_1: Innovations ←overconfidence	0.179	.007	Accepted with .007 significant level
H_2: Innovations ←self-efficacy	-0.061	.027	Accepted with .027 significant level
H_3: Innovations ← loss aversion	-0.345	.011	Accepted with .011 significant level
H_4:Innovations← illusion of control	0.089	.034	Accepted
H_5:Innovations← organizational culture	1.219	***	Accepted

H_6:Firm performance ← innovations	0.444	***	Accepted

Table4shows the path coefficients and p-values of all the variables, that shows there was a strong relationship between overconfidence bias, self-efficacy bias and loss aversion biases with entrepreneurial innovations and the hypothesis of these biases are accepted with significant p-values,i.e., 0.007, 0.027, 0.011 respectively. Meanwhile, there is significant relationship between the illusion of control and innovations, and their p-value was 0.034.

Mediation

Mediation analysis was performed through AMOS 21.Thedirect and indirect effects were analyzed for partial and full mediation. The results have been summarized in the hypothesis summary table 5. As mention in the table, there is full mediation among self-efficacy, loss aversion and the illusion of control bias with entrepreneurial innovations.

Table 5: Mediating factors testing

Hypothesis	Relationships	Direct impact	Indirect impact	Total impact	Supported
H7	OC=>INV=>FP	0.12	0.72	0.84	mediation
H8	SE=>INV=>FP	0.50	0.114	0.614	mediation
H9	LA=>INV=>FP	-0.051	-0.116	-0.614	mediation
H10	IOC=>INV=>FP	0.037	0.17	0.207	mediation
H11	CUL=>INV=>FP	0.092	0.226	0.318	mediation

Discussion of Results

The purpose of this study is to examine the relationship between behavioral biases to firm performance and the mediating role of innovative entrepreneurship.Therefore, they hesitate to bring innovations to their business activities. It was shown that most entrepreneurs were risk adversewhodid not move towards innovations within organizations. After conducting thisstudy, it was derived that there is a strong relationship between organizational culture, entrepreneurial innovations, and firm performance. There is a positive relationship between innovations and firm performance. It means that launching new ideas, the advance pattern of operations or the latest technology, our organization or business will flourish. Moreover, the culture of Pakistan SME's is also innovations adoptive culture (which is shown by this study).In the end, two biases (overconfidence and loss aversion bias) has significant effects

on innovations of entrepreneurship, on the other hand, two biases (the illusion of control and self-efficacy bias) has non-significant effects on innovations. But along with these biases, there is a strong relationship between organizational culture and innovations which shows the adaptability level of Pakistan entrepreneurship.

Conclusion

The study concludes that entrepreneurs are less overconfidentwho hesitate to innovate in business in a prospective manner in developing countries. The entrepreneurs of non-financial corporate industries have also shown a low tendency of control over their powers. It was found that in the scenario of entrepreneurship managers have less self-committed skills.There is a positive relationship between organizational culture and organization innovativeness.

The main recommendation for entrepreneurs and other decision makers is to make many trials to elevate their level of consciousness on behavioral finance by instructing themselves in this field byreviewingabout the biases and considering their decisions that are likely to help in achieving better self-understanding. There is a need for all entrepreneurs to review periodically for the sake to recollect and refresh their memory and in this way; giving a better chance to improvethefinancial decisions in view of the entrepreneurship.

This research is considered an addition in the previous studies of behavioral finance. It contributes to the theory of an additional component of entrepreneurial innovations and their effects on the non-financial industrial sector. Consequently, innovations help the organization to boost up their financial activities and increase its profit margin.

Some limitations relate to personality traits, local culture in entrepreneurship or some are related to the data collection process. The main weakness of this study isthat it depends on the study of behavioral patterns of questionnaires.

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