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TYOLOGY OF BEHAVIORAL BIASES AND HEURISTICS

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Abstract

The theory of behavioral finance attempts to explain many financial facts, notably risk perception, and in this frame, it has been utilized a large number of biases and heuristics which are taken from psychology. This study investigates whether biases and heuristics concepts that mentioned in finance literature, differentiates according to gender, wealth acquisition manner and risk perception by taking these concepts in the broadest perspective. Results show that while endowment, optimism, self-attribution and hindsight biases are much more observed at active structured people; status quo bias is much more observed at passive structured people. Regret aversion, mental accounting, framing, illusion of control, conservatism and overconfidence are more observed at men rather than women. Individuals who have status quo, loss aversion, regret aversion, availability, confirmation and ambiguity aversion biases display more risk aversion behavior. Also, by considering objective and subjective financial literacy, this study analyses the differentiate levels of especially objective financial literacy according to bias and heuristics risk perception in detail. With regards to these properties, findings of the study represent the first attempt in literature.

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1. Introduction

Studies on behavioral finance show that individuals have particular biases, their decisions deviate from rationality time to time and damage the relationship between risk and return (Mitroi & Stancu, 2014). This can be arising not only from investor sentiment, but also behavioral choices. While investor sentiment is a belief regarding investment risk and future cash flows which are not supported by truths on hand (Baker & Wurgler, 2007); behavioral choices are attitudes regarding risk and return that not compatible with expected utility theory.

Simon, by centring rationality, states that individuals appeal shortcuts when they confront with a large number of information. These shortcuts are practical and help to make decision rapidly. However, they cause various mistakes.

There are two important concepts of behavioral finance; bias and heuristic. While bias is predisposition towards an error, heuristic is mental shortcuts or rules which facilitates decision making (Aggarwal, 2014). Even though individuals want to make rational decisions in real life, these decisions deviate from optimal because of bias which people have and heuristics which they apply. As Statman (2014) stated, the underlying reason is that people are normal but not rational.

With this point of view, the theory of behavioral finance attempts to explain many financial facts, notably risk perception, and in this frame, it has been utilized a large number of biases and heuristics which are taken from psychology. However, when early studies investigated, it can be seen that the distinction between bias and heuristics is not as clear as their definitions and there is agreement congruence on even their numbers. Also, when the definition of every single bias and heuristic is considered, notwithstanding that there is high correlation expectation among themselves; there is lack of study that evaluates this situation completely.

Pompain (2008), refers to broadest number of biases and heuristics together in his paper which he developed behavioral alpha approach in order to lead professional fund managers on investor relations. In this study, he classifies both individuals and biases and heuristics which expected that individuals have, according to *wealth attainment of individuals by themselves (active) or by inheritance (passive), featuring cognitive or affective properties fundamentally and their risk tolerance levels*. Nevertheless, the main deficiency of this precious paper is classification of biases and heuristics is completely predicated on Pompain's individual assessments and observations.

In this study, by following Pompain essentially, we are searching the statistical relevance of these classifications. Also we add a new dimension to the classification by including financial literacy variable. Nineteen different biases and heuristics were included to study according to active/passive and cognitive/objective properties of individuals. The relationship of risk perception with either objective or subjective financial literacy level of individuals has been investigated and it has been attempted to make a classification.

2. Literature Review and Theoretical Framework

In this section, all biases and heuristics that subjected to this study will be defined briefly and their main features will be evaluated.

Anchoring is used to describe that individuals utilize from their “reference points” while making decisions (Schinckus, 2011). This reference point is sometimes buying price and sometimes can be the highest price that asset ever has. The loyalty to these values –which can be true at first but lose their trueness with time by lack of required adjustments- causes high commitment to past decisions and low reaction to new information (Mitroi & Stancu, 2014).

Illusion of Control is belief of individuals that they can control the results of facts or at least affect them. Indeed, they can neither control nor affect.

Conservatism can be described as; individuals have a tendency to rely more on past information and less on new ones (Ramiah, Xu, & Moosa, 2015). This bias causes underreaction to new information/knowledge as decelerates well as the adaptation to changes (Schinckus, 2011). Conservatism is closely related to anchoring bias.

Framing can be defined as; decisions are influenced from expressions of facts during decision making process.

Representativeness; De Bondt, Muradoglu, Shefrin & Staikouras (2008) express representativeness bias as; over commitment to stereotypes. Mitroi and Stancu (2014) define this bias as; individual beliefs based on the idea that one observation represents a wide sample. In general, representativeness bias can be evaluated as shading of causality the sample size and probability. Latest developments and information are representatives of main process. While valuating asset prices, recent price movements are taken as a basis (Shiller, 2003). Thus, representativeness is exactly opposite of conservatism and causes overreaction to new information and mental generalization.

Availability can be stated as individuals concentrate on information which they remember and attain easily.

Overconfidence is a bias that individuals tend to overvalue their knowledge and abilities. It is seen that both accuracy of information and individual competence are exaggerated (Glaser & Weber, 2007; Deaves, Lüders & Luo, 2008; Graham, Harvey & Huang, 2009). Previous achievements cause overconfidence generally. Also, inaccurately, when information increases, confidence in decisions increases as well. However, number of information is confused with its quality frequently (Hall, Ariss & Todorov, 2007).

Previous studies show that overconfidence bias causes excessive buying-selling transactions (Odean, 1998; Statman, Thorley & Vorkink, 2006) and insufficient diversification (Goetzmann & Kumar, 2008). Findings regarding market reaction are complicated. While Mitroi and Stancu (2014) state that overconfidence is reason of underreaction, Qawi (2010) determines that it is reason of overreaction.

Ambiguity Aversion can be defined as; individuals prefer uncertainty when they feel informed or capable, otherwise they go toward risk. It is seen that while individuals assessing their investment choices, they generally avoid risk and prefer familiar alternatives. In general, it is accepted that individuals do not like uncertainty and select alternatives which results are cleaner.

Self-Attribution bias is described as; people attribute success to their abilities and failure to bad luck (DeBondt et al., 2008). This bias is closely related to overconfidence.

Loss Aversion is reluctance of investors about realizing losses. It prevents individuals from decide of change and leads to protect current situation (Mitroi & Stancu, 2014). Indeed, people avoid from lose rather than risk (Schinckus, 2011). Generally, it is accepted that people are two times more sensitive to

losses than earnings. *Endowment* bias is to value an object which a person already own and face to probability of losing more than an object which he does not own but there is a possibility to acquire.

Self-Control is lack of ability of a person to construct balance between current and future expense desire and his needs. Especially, effect of this bias is seen in savings and pension decisions.

Regret Aversion refers to an individual behavior that not to sell asset under the thought of regret if price increases after sold. This bias causes to hold losing assets too long (Shefrin & Statman, 1985) and avoiding investment to decreasing priced assets (Shiller, 2003).

Regency states that people tend to remember noticeable, care about new events and observations and believe to predict patterns that do not exist.

Mental Accounting is categorizing incomes and expenses of individuals by classifying. Shefrin and Thaler (1988) assume that people categorize their wealth under three mental accounts; current income, current wealth and future income. While expense desire is most related to current income, it is the least related to future income.

Optimism is positive thoughts of investors regarding their own investments and financial decisions that do not based on a valid reason. It is possible to observe various effects of optimism bias on financial decisions. While Oprean (2015) addresses to its relation with trading volume, Park and Sohn (2013) states that optimism is related to investing and borrowing. Kahneman and Lovollo (1993) mention that it is possible to observe optimism bias in capital budgeting decisions.

Status Quo is a bias that refers to idea of when people met a various of alternatives, whatever the choice is, they tend to protect the current situation.

Confirmation is searching and approving of individual the information and developments which support his own decisions. However, individuals who exposed to this bias, ignore the information that conflict with their decision and assume that they do not exist. Lusardi and Mitchell (2008) determine that, more than half of individuals accept professional consulting only if it supports their own decisions. Statman (2014) states that fund managers remember and tell their success stories rather than failure ones. Park and Sohn (2013) emphasize that financial crisis of 2008 arises not from fundamental problems, but from psychological reasons as optimism and confirmation biases.

Hindsight is belief of individual that future can be predicted as simple as past (Statman, 2014). These individuals think that they have predicted market rise and falls in the past and so they can predict future rise and falls. However, they realize the past movements afterwards and they cannot predict in advance.

Qawi (2010) emphasize that conservatism, anchoring, availability, confirmation and representativeness are sources of underreaction.

3. Research Method

3.1. Sample and Data Collection

This study aims to classify nineteen biases and heuristics that accepted in behavioral finance literature, according to whether individuals are cognitive or affective, whether they attain wealth by themselves (active) or by inheritance (passive) and according to their risk perceptions. In this frame, both objective and subjective effects of financial literacy will be evaluated.

Data was collected with convenience sampling method and based on voluntariness from 100 respondents who are university students and banking sector employees. In the study, endowment, status quo, loss aversion, regret aversion, anchoring, mental accounting, framing, illusion of control, optimism, auto control, self-attribution, conservatism, availability, confirmation, regency, hindsight, representativeness, ambiguity aversion and overconfidence biases and heuristics have been investigated. In this frame, based on the literature given above, question which determines the existence of every bias and heuristic have been written and measured via 5 point-likert scale. Besides, Aydemir and Aren (2017)'s scale has been used in order to measure risk perception and Van Rooij, Lusardi & Alessie, (2011) has been used for objective financial literacy.

3.2. Analyses

This study investigates the fundamental biases and heuristics, whether they differentiate according to investors' risk perceptions, wealth acquisition circumstances (active or passive) and cognitive or affective being. Unfortunately, being cognitive or affective structured which is an important component in individuals' decision making behavior, could not be searched due to reasons arising from sample. Whilst 91 participants of 100 are cognitive structured randomly, only 3 of them are affective structured. Hence, while it has been planned at the beginning, the relationship of this characteristic with biases and heuristics have been deprived of being evaluated.

4. Findings

Chi-Squared tests have been run in order to analyze whether active and passive structured individuals' biases and heuristics differentiate. Results show that five biases differentiate with p-value=0,10.

Table 01. X^2 Test Results With Regards to Differentiation of Biases and Heuristics According to Active/Passive Structure

Biases and Heuristics		Bias	Non-Bias	% of Total Biases	% of Active/Passive	X^2
Endowment	Active	53	4	62,4	93	0,01
	Passive	32	11	37,6	74,4	
Status Quo	Active	16	41	44,4	28,1	0,057
	Passive	20	23	55,6	46,5	
Optimism	Active	30	27	69,8	52,6	0,025
	Passive	13	30	30,2	30,2	
Self- Attribution	Active	30	27	68,2	52,6	0,045
	Passive	14	29	31,8	32,6	
Hindsight	Active	34	23	66,7	59,6	0,046
	Passive	17	26	33,3	39,5	

With regards to endowment bias, it is seen that there is a differentiation between active and passive structured individuals with p-value=0,01. While 64% of individuals who have this bias are active structured, also 93% of active structured individuals have this bias. Similarly, as statistically significant, optimism,

self- attribution and hindsight biases were observed more frequently in active structured individuals. On the other hand, status quo bias was observed more frequently in passive structured individuals relatively.

Investigating the differentiation of biases and heuristics from the point of gender, which is a fundamental demographic variable, provides considerable interesting findings.

Table 02. χ^2 Test Results With Regards to Differentiation of Biases and Heuristics According to Gender

Biases and Heuristics		Bias	Non-Bias	% of Total Biases	% of Active/Passive	χ^2
Endowment	Active	53	4	62,4	93	0,01
	Passive	32	11	37,6	74,4	
Status Quo	Active	16	41	44,4	28,1	0,057
	Passive	20	23	55,6	46,5	
Optimism	Active	30	27	69,8	52,6	0,025
	Passive	13	30	30,2	30,2	
Self- Attribution	Active	30	27	68,2	52,6	0,045
	Passive	14	29	31,8	32,6	
Hindsight	Active	34	23	66,7	59,6	0,046
	Passive	17	26	33,3	39,5	

5. Conclusion and Discussions

There are a great number of studies regarding bias and heuristics. However, a study which classifies and investigates the differentiation of these according to risk perception, way of wealth acquisition, gender and financial literacy levels does not exist. Hence, this study contributes to the literature by filling this important gap and provides reference findings to the former studies.

As a result of many analyses, endowment, optimism, self-attribution and hindsight biases are much more observed at active structured people, status quo bias is much more observed at passive structured people relatively. Regret aversion, mental accounting, framing, illusion of control, conservatism and overconfidence are more observed at men rather than women. Other bias and heuristics do not differentiate according to gender.

Individuals who have status quo, loss aversion, regret aversion, availability, confirmation and ambiguity aversion biases display more risk aversion behavior. On the contrary, framing and self-attribution biases increase risk appetite. Besides, financial literacy eliminates only the effect of framing on risk perception.

In this study, the relationship between objective and subjective financial literacy -that we think it is considerably important- is also investigated. There is a statistically significant relation between objective and subjective financial literacy, beside this, individuals overvalue their financial literacy level prominently.

As a consequence, findings of the study are unique with regards to all subjects that almost mention and have a great importance. It is important for former studies to investigate similar facts in different times and different samples, for testing and supporting the results of study.

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