The Impact of Psychological Biases on the Decision-making of the Individual Albanian Investor

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ABSTRACT

The study aims to measure the impact of psychological biases on financial decisions of the albanian individual investor. The paper uses primary data provided through structured interviews with 180 individual investors and one semi-structured interview with an expert of the financial market in Albania. Exploratory financial analysis, cronbach alpha test and descriptive analysis are used through R-software. The analysis and its results conclude a significant presence of psychological biases on the albanian individual investor behaviour. As there is too little research done on this field in Albania, the study informs of the presence of these biases and tries to explain their impact not only on the previous crisis the country has experienced, but also on the current situation of the financial market in the country.

Keywords: Psychological Bias, Individual Investitor, Financial Decision-making, Financial Market
JEL Classifications: G, G4, G41

1. INTRODUCTION

Behavioral factors have not been for long considered as important variables relating to finance and investments and no sufficient attention has been paid to studying their impact on investor decision-making. What led to the emergence and evolution of behavioral finance was the inability of economists to explain the repeated occurrence of anomalies and financial crises in financial markets. Instead of dictating the optimal and ideal behavior one should have, this new field of finance aims to explain the actual financial behavior by identifying the mistakes and psychological biases during investor's financial decision-making.

Different studies in different countries have contributed in identifying these psychological bias and in measuring their quantitative impact on financial decision-making of investors. This will be as well the aim of the study for the albanian investor, although unlike the other more developed countries, albanian financial market is at its early stage of formation and still unproperly consolidated.

During its transition the country has experienced two significant financial crisis urged also by the wrong decision-making of its individual investors. It is necessary to study and explain these important difficult past periods as well as the current country's situation of the financial market from the perspective of financial behavior, by studying the impact of psychological biases on the albanian individual investor behavior. The research question the study aims to answer is: To what extent are the albanians affected by psychological biases while taking financial decisions?

2. LITERATURE REVIEW

2.1. Main Psychological Biases
Psychological biases are one of the most important factors among the various behavioral variables affecting investor decision-

making. We further present them according to the following classification:

2.1.1. Heuristics biases
Representativeness: The tendency to be optimistic towards recent good investments and pessimistic towards bad ones. According to Chen et al. (2007), investors tend to buy stocks that have recently had high returns as a benchmark for a good investment.

Availability: People tend to assess the likelihood of the occurrence of an event based on its frequency of occurrence, on the ease with which such events can be retrieved from memory or on emotions felt for previously experienced similar events.

Anchoring: This bias makes investors hold investments which have fallen in value because they "anchor" their valuation at the initial purchase price rather than at their intrinsic value. They continue to hold the investment hoping that the asset price will reach its initial purchase price.

Player's fallacy: The investor believes that a random event is less likely to occur after a series of similar events. There are investors who think they should close a position, for example sell a stock that has been traded and overvalued for a long time, believing that the position will stop improving.

Overconfidence: People tend to be overconfident in their abilities and knowledge (Glaser et al., 2010). Brad and Terrance (2001) show that overconfident investors believe that they have greater ability than others in choosing shares or the moment when to change a position. According to Bloomfield et al. (1999), less literated investors show more overconfidence then the literated ones.

2.1.2. Perspective theory biases
Regret aversion: Investors who exhibit this bias take less risk to reduce the chances of bad results. The bias may explain investor's reluctance to sell the resulting loss investments just to not admit the fact that decision-making has been bad.

Loss aversion: As the negative feeling for losses outweighs the positive feeling the same absolute amount earned causes, investors position themselves on very short-term investments.

Mental accounting: The bias happens unconsciously prompting the individual to group money into "different mental boxes" and afterwards decide about their separate use.

2.1.3. Herding
People need to feel accepted by the group rather than excluded, thus behaving as the group does, is the best way becoming part of it. The bias explains best bubbles and market crises.

2.2. Summary of Literature Review on Measuring the Impact of Psychological Factors on Investor Decision-making
Table 1 presents a summary of the recent literature review about measuring the impact of psychological biases on investor behavior.

3. MATERIALS AND METHODS

The technique used is the judgemental sampling technique, a non-probabilistic technique, where a specific group of individuals is selected to provide specific data. The interviewees are individuals who save and invest in different financial segments. The criteria used for selecting the sample are:
1. The investor earns medium or high income
2. The investor has invested also in other financial investment alternatives in the country other than bank deposits
3. The investor has a sufficient level of financial literacy.

3.1. Research Methods
The mixed methods approach used in the study implies that both data collection (quantitative and qualitative) techniques, as well as the respective analysis procedures, are used in a single research model. Quantitative research helps us identify and describe variables and also establish a relationship between them (Garner et al., 2011).

Focusing on numbers and statistics, the quantitative study can lose the ability to distinguish individuals from institutions, being slightly superficial as it cannot directly link life to research (Bryman and Bell, 2007). For this reason, in order to better understand the result, in addition to the quantitative method, the qualitative one is also used. The paper concludes with interviewing the expert who helps us interpret and understand more about investor behavior and its impact in the market. According to Bryman and Bell (2007), when using mixed methods, researchers can start with either the quantitative method or the qualitative method. As the research question is based on theories of financial behavior, we first use the quantitative method, and after that we use the qualitative method. As behavioral finance is a complex field, the involvement of the financial expert is necessary to provide more detailed explanations of the results of the quantitative analysis.

3.2. Techniques and Procedures
Primary and secondary data for this study were obtained during the years 2016-2018. Medium-income and "Premium" clients of Raiffeissen Bank have been selected to be interviewed. They have invested at least in one of the following investment alternatives: treasury bills, government bonds, investment funds, pension funds, as well in time deposits. This is the only commercial bank in the country which offers alternatives of investment in three different types of Investment Funds. This institution represents the market "de facto" due to its high share in the Albanian financial market, respectively in the investment funds market with around 80% of this market (Figure 1).

The sample consists of 180 investors who meet the criteria. Instead of delivering self-administered questionnaires, we choose to use the structured interviews for collecting primary data. This technique gives us an almost twice as high response rate as well as higher reliability and accuracy.

3.3. Structured Interview
It consists of 26 questions, grouped according to behavioral finance theories into three classifications: Heuristics (A), Perspective (B),

Table 1: Summary of literature review

Author	Finding	Data	Instrument	Method	Statistical analysis
Luong and Ha (2011)	Heuristics, perspective, herding and the market impact investor decision-making in Vietnam	Primary	Structured questionnarie	Quantitative	Descriptive analysis, factorial analysis, chronbach alpha test
			Semi-structured interview	Qualitative	
Subash (2012)	New investors in India show the player's fallacy, anchoring and retrospective bias more than the experienced investors	Primary	Structured questionnarie	Quantitative	Discriminant analysis, wighting scoring method, hi-square test, multicolinearity test
Chitra and Jayashree (2014)	Representativeness and overconfidence, determinants of investor decision-making in India	Primary	Structured questionnarie	Quantitative	Descriptive analysis, factorial analysis ANOVA
Prosad (2014)	Overconfidence, optimism and herding, affect stock market and investor decision-making in India	Secondary	Stock market data	Quantitative	Linear regression, times series regression, kernel pricing technique, GARCH
		Primary	Structured questionnarie		Chronbach alpha, hi-square, t-test
Anastasia and Suwitro (2015)	Emotions and psychological biases affect Indonesians more when they invest in houses rather than when buying a house to live in	Primary	Structured questionnarie	Quantitative	Chronbach alpha test, discriminant analysis
Bakar and ChuiYi (2016)	Overconfidence and availability affect decision-making and vary by investor gender in Malaysia	Primary	Structured questionnarie	Quantitative	Multiple regression analysis
Sarwar and Afaf (2016)	Psychological factors affect investment decision making in Pakistan more than economic factors	Primary	Structured questionnarie	Quantitative	Descriptive analysis, factorial analysis, regression analysis, multikolinearity, t-test, ANOVA
Kubilay and Bayrakdaroglu (2016)	Turkish investor's personality influences psychological biases and his risk tolerance	Primary	Structured questionnarie	Quantitative	Hi-square analysis, logistic regression analysis
Rasheed et al. (2018)	Representativeness and availability impact investor's decision-making in Pakistan	Primary	Structured questionnarie	Quantitative	Structured equation model, simple linear regression

Source: Author summary based on literature review about behavioral finance

Figure 1: Value of investment funds net assets in Albania (June 2018)
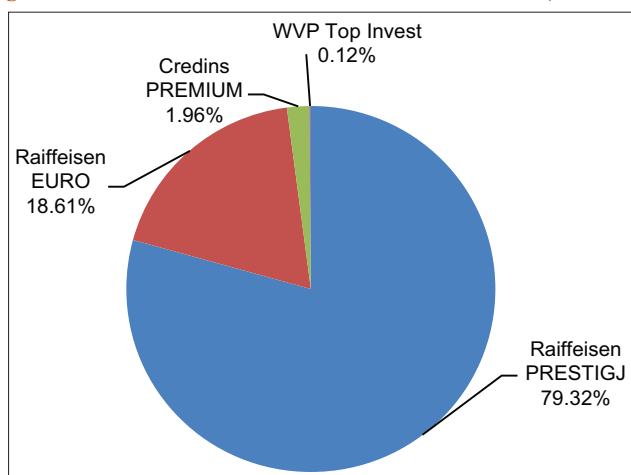
Source: Statistical Report, collective investment ventures market, 30 June, 2018

and Herding (C), (Table 2; Annex B). Each question is measured on a Likert scale from 1 (strongly disagree) to 5 (strongly agree).

3.4. Steps of Quantitative Strategy

The quantitative analysis explores the importance of psychological biases on individual investor decision making in financial assets in Albania. The variables undergo the exploratory factor analysis, the Cronbach's alpha reliability test and the inferential analysis.

3.5. Semi-structured Interview

Semi-structured interviews are used to explore and explain issues arising from the use of a questionnaire (Tashakkori and Teddlie, 1998). The authors point out that semi-structured or in-depth interviews can be used as part of mixed methods research, to explain findings from analysing data gathered from questionnaires.

3.6. Steps of Qualitative Strategy

We contacted the financial market expert and submitted him the results of the statistical analysis. We sent the expert a basic summary literature on psychological factors by email in order to help him get acquainted with main theoretical concepts of the study. The expert then assigned us an appointment during which we conducted the semi-structured interview (Annex A).

4. DATA ANALYSIS AND RESULTS

4.1. Exploratory Factorial Analysis

It is a statistical method which determines the basic structure of a multi-variable data matrix. It aims is to identify a set of basic dimensions, called factors, by studying the structure of the correlation between

variables. According to EFA variables become part of homogeneous clusters with similar characteristics: factors (O'Brien, 2007). Analysis is based on a large number of variables aiming to group them into a smaller number of factors which undergo to further statistical analysis. To evaluate whether the data are appropriate enough to undergo this analysis, we need to focus on the magnitude of the choice as well as on the robustness of the correlation between the variables. A sample size of 150 cases is sufficient (Tabachnick and Fidell, 2007). The same authors suggest a factorial load >0.3. Factorial load is defined as the correlation of each element with the factor to which it belongs.

In this study the factors are nine, respectively: Representativeness, overconfidence, anchoring, player's fallacy, availability, loss aversion, regret aversion, mental accounting, herding. The corresponding responses to these nine factors are 26 in total. We specifically code them as: A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13, A14, A15, B1, B2, B3, B4, B5, B6, C1, C2, C3, C4, C5.

We install the R software, "psych" and "GPArotation" packages so that we can perform EFA. AT first we need to confirm the number of factors which will be analysed. Various methods such as "Eigenvalue" or "Parallel Analysis" can be used for this. We specifically use the "fa.parallel" function, part of the "Psych" package to perform the "parallel" analysis. This function makes it possible to determine the exact number of factors. By the "Parallel Analysis" method, we compare the set of observed data factors with a matrix generated from random data, which has the same dimensions as the original estimated matrix. This procedure can be performed for continuous, dichotomous and politomic data. "Pearson," "tetrachoric" and "polychoric" correlations can as well be used (Revelle and Rocklin, 1979; Revelle, 2018). The corresponding result suggests a number of factors equal to 9. The MR1, MR2, MR3, MR4, MR5, MR6, MR7, MR8 and MR9 factors generated by the program correspond to the initial factors suggested by the relevant literature (Tversky and Kahneman, 1974; Waweru et al., 2008).

The rotation procedure which indicates which variables are "grouped" together is performed after the number of factors is defined. Direct oblimin is the most commonly used technique for this (Tabachnick and Fidell, 2007). The program generates clusters according to Table 3. Only factors with values >0.3 are taken into

Table 2: Structure of psychological biases with relevant questionnaire questions

Category	Psychological bias	Question
Heuristics	Heuristics of representativeness	A1, A2, A3
	Overconfidence	A4, A5, A6, A7
	Anchoring	A8, A9
	Players's fallacy	A10, A11, A12
	Availability	A13, A14, A15
Perspective	Loss aversion	B1, B2
	Regreet aversion	B3, B4
	Mental accounting	B5, B6
Herding		C1, C2, C3, C4, C5

Source: Author

Table 3: The results of factorial analysis for the 9 biases through R-software

	Standardized loadings (pattern matrix) based upon correlation matrix								
	MR1	MR2	MR3	MR4	MR5	MR6	MR7	MR8	MR9
A1	0.47								
A2	0.63								
A3	0.48								
A4		0.71							
A5		0.51							
A6		0.63							
A7		0.74							
A8			0.87						
A9			0.47						
A10				0.69					
A11				0.73					
A12				0.84					
A13					0.67				
A14					0.57				
A15					0.53				
B1						0.54			
B2						0.89			
B3							0.46		
B4							0.77		
B5								0.85	
B6								0.90	
C1									0.66
C2									0.52
C3									0.87
C4									0.66
C5									0.62

Tucker-Lewis index of factoring reliability=0.907

The root mean square of the residuals (RMSR) is 0.02

RMSEA index=0.001 and the 90% confidence intervals are 0 0.07

BIC=−150.64

Fit based upon off diagonal values=0.91

consideration for further analysis. As the values of "loads" are in any case higher than 0.3, the question structure remains the same. The validity of the model is confirmed (Table 3):
- The RMSR (root mean square of residuals) is 0.02, an acceptable value as it should be around zero
- The RMSEA value is 0.001, a good fit of the model as it is lower than 0.05
- The Tucker-lewis index is 0.907, an acceptable value as it is higher than the limit value of 0.9 (Revelle, 2018).

After the EFA confirmed the logical value of the classification of variables according to nine psychological factors (representativeness A1, A2, A3; overconfidence A4, A5, A6, A; anchoring A8, A9; player's fallacy A10, A11, A12; availability A13, A14, A15; loss aversion B1, B2; regret aversion B3, B4; mental accounting B5, B6; herding C1, C2, C3, C4, C5), the analysis continues with chronbach alpha test.

4.2. Cronbach Alpha Test

A valid questionnaire means that the data collected is consistent and coherent. Foddy (1994) discusses validity and reliability in the context of meaningful questions and answers. It states that "the question must be understood by the respondent as it is intended by the researcher and the respondent answer must be understood by the researcher as intended by the respondent." The test is commonly used in behavioral science studies to test the reliability of the internal consistency of the Likert scale measurements (Liu

et al., 2010). As such, since the research is on behavioral finance and as we used the 5-point Likert scale, the test is considered most appropriate for our study.

In the paper, the cronbach alpha test will be conducted with R-software, to test the reliability of the measurements included in the factors formed after the EFA. Values of cronbach alpha >0.6 ensure that the measurements are reliable (Field et al., 2012; Kline, 1999).

Criteria for statistical indicators:
- *Raw_alpha'*: "Cronbach α" value- values >0.6 or 0.7 show high reliability (Field et al., 2012; Kline, 1999)
- "*Std.alpha*": This value is usually similar to "raw_alpha," so we can rely on the first value
- "*G6*": Guttman's Lambda (calculated by multiple correlation)
- "*Average_r*": Average correlation between variables (used to calculate "std.alpha")
- "*Mean*": The simple mathematical average of all individual means
- "*Sd*": Standard deviation.

In the "Reliability if an item is dropped" section, reliability is given if the relevant variable is eliminated. If the alpha value results in any case greater than the total alpha value, then the variable associated with it must be eliminated. The other columns include other statistics if the relevant variable is not considered.

Table 4: Results for "Representativeness"

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.7	0.7	0.67	0.44	2.4	0.039	2.8	0.64	0.48
Lower alpha				**Upper**			**95% confidence boundaries**	
0.62				0.7			0.78	
Reliability if an item is dropped								
raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
A1	0.36	0.36	0.22	0.22	0.56	0.095	NA	0.22
A2	0.65	0.65	0.48	0.48	1.86	0.052	NA	0.48
A3	0.76	0.77	0.62	0.62	3.26	0.035	NA	0.62
Item statistics								
	n	raw.r	std.r	r.cor	r.drop	mean	sd	
A1	180	0.88	0.88	0.83	0.70	2.8	0.82	
A2	180	0.75	0.77	0.63	0.48	2.9	0.75	
A3	180	0.74	0.72	0.49	0.40	2.6	0.85	

Table 5: Results for "Representativeness" excluding variable A3

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.76	0.77	0.62	0.62	3.3	0.035	2.8	0.7	0.62
Lower alpha				**Upper**			**95% confidence boundaries**	
0.7				0.76			0.83	
Reliability if an item is dropped								
raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
A1	0.62	0.62	0.38	0.62	0.56	NA	0.62	0.62
A2	0.38	0.62	25	0.61	1.85	NA	0.38	0.62
Item statistics								
	n	raw.r	std.r	r.cor	r.drop	mean	sd	
A1	180	0.91	0.9	0.71	0.62	2.8	0.82	
A2	180	0.89	0.9	0.71	0.62	2.9	0.75	

In the "Item statistics" section:
- "*Raw.r*": The correlation between the variable and the total of answers
- "*R.drop*": The correlation between the variable and the total of "corrected" responses by the variable itself. Low values (approximately <0.3) indicate that the relevant variable is not sufficiently correlated with the total estimate.

In this part of the analysis, we aim to eliminate the section variables (questions) from further analysis. First we need to have a total alpha value >0.6. Second, we need to verify that all values of "raw_alpha" in the "Reliability if an item is dropped" table, are smaller than the general alpha value. At last, in the "Item statistics" section, values of "r.drop" must be (approximately) >0.3.

Table 6: Results for "Overconfidence"

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.79	0.78	0.76	0.47	3.6	0.024	3	0.6	0.5

Lower alpha				Upper			95% confidence boundaries	
0.74				0.79			0.84	

Reliability if an item is dropped								
raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
A4	0.70	0.70	0.66	0.44	2.3	0.036	0.04335	0.40
A5	0.67	0.66	0.61	0.39	2.0	0.039	0.04164	0.31
A6	0.83	0.84	0.77	0.63	5.1	0.021	0.00095	0.63
A7	0.70	0.70	0.63	0.43	2.3	0.037	0.02244	0.40

Item statistics							
	n	raw.r	std.r	r.cor	r.drop	mean	sd
A4	180	0.83	0.81	0.73	0.66	3.0	0.82
A5	180	0.86	0.85	0.81	0.72	3.1	0.77
A6	180	0.57	0.63	0.41	0.36	3.0	0.60
A7	180	0.84	0.82	0.76	0.67	3.1	0.84

Table 7: Results for "Overconfidence" excluding variable A6

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.83	0.84	0.77	0.63	5.1	0.021	3.1	0.7	0.63

Lower alpha				Upper			95% confidence boundaries	
0.79				0.83			0.88	

Reliability if an item is dropped								
raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
A4	0.79	0.80	0.66	0.66	3.9	0.031	NA	0.66
A5	0.77	0.77	0.63	0.63	3.4	0.034	NA	0.63
A7	0.75	0.75	0.60	0.60	3.0	0.037	NA	0.60

Item statistics							
	n	raw.r	std.r	r.cor	r.drop	mean	sd
A4	180	0.86	0.86	0.73	0.67	3.0	0.82
A5	180	0.86	0.87	0.76	0.70	3.1	0.77
A7	180	0.88	0.88	0.79	0.72	3.1	0.84

Table 8: Results for "Anchoring"

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.26	0.26	0.15	0.15	0.34	0.11	3.3	0.5	0.15

Lower alpha				Upper			95% confidence boundaries	
0.04				0.26			0.47	

Reliability if an item is dropped								
raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
A8	0.146	0.15	0.021	0.15	NA	NA	0.146	0.15
A9	0.021	0.15	NA	NA	NA	NA	0.021	0.15

Item statistics							
	n	raw.r	std.r	r.cor	r.drop	mean	sd
A8	180	0.76	0.76	0.29	0.15	3.3	0.66
A9	180	0.75	0.76	0.29	0.15	3.3	0.65

After the questions were converted according to literature guidelines (Field et al., 2012; Kline, 1999), the following analysis was performed. If the responses do not follow the trend of the corresponding characteristic, the R-software automatically converts the variable. The "output" of the calculation of "Cronbach – α" for representativeness, overconfidence, anchoring, player's fallacy, availability, loss aversion; regret aversion, mental accounting, herding, is presented in the following paragraphs.

4.2.1. Representativeness
The value of the total alpha is 0.70. We must prove that all values of "raw_alpha" in the "Reliability if an item is dropped" table are greater (or equal) than the general alpha value. The variable A3 does not meet this condition. Values of "r.drop" in the "Item statistics" section must be (approximately) >0.3. in this case the variables meet the condition (Table 4). R-software recalculates "Cronbach's α" excluding variable A2 (Table 5). In this case all conditions are met.

4.2.2. Overconfidence
Total alpha value must be >0.6. This value is 0.79. All values of "raw_alpha" in the "Reliability if an item is dropped" are smaller (or equal) than the general alpha value. Variable A6 does not meet this condition. Values of "r.drop" must be >0.3 at the "Item statistics." In this case the variables meet the condition (Table 6).

Table 9: Results for player's fallacy

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.46	0.45	0.39	0.22	0.83	0.07	3.4	0.51	0.12

Lower alpha				Upper			95% confidence boundaries	
0.32				0.46			0.59	

Reliability if an item is dropped								
raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
A10	0.21	0.21	0.12	0.12	0.26	0.118	NA	0.12
A11	0.21	0.21	0.12	0.12	0.27	0.117	NA	0.12
A12	0.58	0.59	0.41	0.41	1.41	0.062	NA	0.41

Item statistics							
	n	raw.r	std.r	r.cor	r.drop	mean	sd
A10	180	0.74	0.74	0.55	0.37	3.4	0.72
A11	180	0.76	0.74	0.55	0.36	3.4	0.79
A12	180	0.58	0.60	0.20	0.14	3.3	0.71

Table 10: Results for "Availibility"

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.69	0.69	0.6	0.43	2.3	0.04	3	0.64	0.42

Lower alpha				Upper			95% confidence boundaries	
0.62				0.69			0.77	

Reliability if an item is dropped								
raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
A13	0.65	0.65	0.48	0.48	1.8	0.052	NA	0.48
A14	0.57	0.57	0.39	0.39	1.3	0.065	NA	0.39
A15	0.59	0.59	0.42	0.42	1.4	0.061	NA	0.42

Item statistics							
	n	raw.r	std.r	r.cor	r.drop	mean	sd
A13	180	0.77	0.77	0.56	0.47	2.9	0.83
A14	180	0.80	0.80	0.65	0.54	2.9	0.80
A15	180	0.79	0.79	0.63	0.52	3.1	0.81

Table 11: Results for "Loss Aversion"

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.71	0.71	0.55	0.55	2.4	0.044	4	0.69	0.55

Lower alpha				Upper			95% confidence boundaries	
0.62				0.71			0.79	

Reliability if an item is dropped								
raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
B1	0.55	0.55	0.3	0.55	NA	NA	0.55	0.55
B2	0.30	0.55	0.31	0.44	NA	NA	0.30	0.55

Item statistics							
	n	raw.r	std.r	r.cor	r.drop	mean	sd
B1	180	0.88	0.88	0.65	0.55	4	0.78
B2	180	0.88	0.88	0.65	0.55	4	0.79

R recalculates "Cronbach's α" excluding variable A6. Finally, all conditions are met (Table 7).

4.2.3. Anchoring
As the value of the total alpha is 0.26, this variable cannot be used for further analysis (Table 8).

4.2.4. Player's fallacy
The value of the general alpha should be >0.6. As its value in this case is 0.46, this variable cannot be used for further analysis (Table 9).

4.2.5. Availibility
The value of the total alpha is 0.69. All "raw_alpha" values are smaller than the general alpha value. Values of "r.drop" are >0.3. As the variables meet the conditions, all of them can be used for further analysis (Table 10).

4.2.6. Loss aversion
The value of the total alpha is 0.71, >0.6. All values of "raw_alpha" are lower than general alpha value. Values of "r.drop" are higher

Table 12: Results for "Regret Aversion"

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.53	0.53	0.36	0.36	1.1	0.069	3.3	0.67	0.36

Lower alpha				Upper			95% confidence boundaries	
0.4				0.53			0.67	

Reliability if an item is dropped								
raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
B3	0.36	0.36	0.13	0.36	NA	NA	0.36	0.36
B4	0.13	0.36	NA	NA	NA	NA	0.13	0.36

Item statistics							
	n	raw.r	std.r	r.cor	r.drop	mean	sd
B3	180	0.83	0.83	0.5	0.36	3.1	0.83
B4	180	0.82	0.83	0.5	0.36	3.4	0.80

Table 13: Results for "Mental accounting"

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.72	0.72	0.56	0.56	2.6	0.042	3.8	0.87	0.56

Lower alpha				Upper			95% confidence boundaries	
0.63				0.72			0.8	

Reliability if an item is dropped								
raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
B5	0.56	0.56	0.32	0.56	NA	NA	0.56	0.56
B6	0.32	0.56	0.33	0.54	NA	NA	0.32	0.56

Item statistics							
	n	raw.r	std.r	r.cor	r.drop	mean	sd
B5	180	0.90	0.88	0.66	0.56	3.7	1.05
B6	180	0.87	0.88	0.66	0.56	3.9	0.91

Table 14: Results for herding

raw_alpha	std.alpha	G6(smc)	average_r	S/N	ase	mean	sd	median_r
0.92	0.92	0.91	0.69	11	0.0099	3.3	0.92	0.68

Lower alpha				Upper			95% confidence boundaries	
0.9				0.92			0.94	

Reliability if an item is dropped								
raw_alpha	std.alpha	G6(smc)	average_r	S/N	alpha	se	var.r	med.r
C1	0.9	0.9	0.88	0.70	9.2	0.012	0.0017	0.70
C2	0.9	0.9	0.87	0.68	8.7	0.013	0.0020	0.67
C3	0.9	0.9	0.87	0.69	8.8	0.012	0.0022	0.67
C4	0.9	0.9	0.88	0.69	9.1	0.012	0.0028	0.68
C5	0.9	0.9	0.88	0.68	8.6	0.013	0.0028	0.66

Item statistics							
	n	raw.r	std.r	r.cor	r.drop	mean	sd
C1	180	0.85	0.86	0.81	0.77	3.1	1.0
C2	180	0.87	0.87	0.84	0.80	3.4	1.0
C3	180	0.87	0.87	0.83	0.79	3.3	1.1
C4	180	0.86	0.86	0.81	0.78	3.2	1.1
C5	180	0.88	0.88	0.84	0.80	3.3	1.1

Table 15: Means for heuristics, perspective and herding

Statistics	Heuristics								Perspective				Herding				
	Representativeness		Overconfidence			Availability			Loss aversion		Mental accounting		Herding				
	A1	A2	A4	A5	A7	A13	A14	A15	B1	B2	B5	B6	C1	C2	C3	C4	C5
Mean[1]	2.85		3.06			2.97			4.01		3.93		3.28				
Standard deviation	0.81		0.78			0.81			0.83		0.97		1.05				
Impact	Moderate		Moderate			Moderate			Strong		Strong		Moderate				

[1]Mean is calculated as the simple average of the means of each variable

than 0.3. The variables meet the condition. All of these questions can be used for further analysis (Table 11).

4.2.7. Regret aversion
As the total alpha value in this case is 0.53, <0.6, these questions cannot be used for further analysis (Table 12).

4.2.8. Mental accounting
The value of the total alpha in this case is 0.72, >0.6. The values of "r.drop" are higher than 0.3, thus making it possible that these variables can be further used in the analysis (Table 13).

4.2.9. Herding
The value of the total alpha is 0.92. This value is significantly higher than the standard value of 0.6, so this condition is met. We need to verify that all values of "raw_alpha" are smaller (or equal) than the general alpha value. Variables meet this condition. The values of "r.drop" should be (approximately) >0.3. The variables finally meet the condition (Table 14).

Factors which did not meet the criteria required are not reliable and those which met the criteria, influence decision-making. Three factors were eliminated and there were left only six out of nine.

4.3. Descriptive Statistics
It is used to determine the level of impact of psychological biases on individual investor decision-making. It consists in calculating the mean and standard deviation of the variables left after the EFA and the cronbach's alpha test. The following criteria are set to determine the level of the impact of the variables (Luong and Ha, 2011):
- Means in value smaller than 2, indicate very weak impact of the variable
- Means in value ≥2 and significantly smaller than 3, indicate relatively weak impact of the variable
- Means in value slightly smaller and >3, indicate moderate impact of the variable
- Means in value significantly >3 and slightly smaller than 4, indicate relatively strong impact of the variable
- Means in value ranging from 4 to 5, indicate very strong impact of the variable.

Table 15 summarizes the values of means and standard deviations of Heuristics, Perspective and Herding which determine the level of the respective impact on albanian individual investor decision-making.

5. CONCLUSIONS

The results show that psychological biases affect individual investor decision-making while investing in financial assets in Albania. The extent of this impact ranges from moderate to strong.
a. Although facts have shown (the case of pyramid schemes in 1997 in Albania) "herding" has been actively present in albanians' decision-making, the current situation shows another level of investor prudence. Although at a completely different stage of the Albanian financial system, the underdeveloped financial market in the country and the very low level of individual financial literacy makes investors imitate each other's actions, believing that the others may be more informed then them
b. Usually investors in the financial market in Albania exhibit a tendency of relatively overconfidence. These results are also strongly influenced by the fact that the interviewed investors are middle and high income investors, with an above average self-perceived level of financial literacy, which does not necessarily indicate a high level of it
c. As they are affected by "Representativeness," investors in Albania tend to join the investment fund when the quota price continues to rise, as they feel optimistic about its continued growth, but fear and withdraw their funds when the price of the quota declines as a result of its short-term fluctuations
d. "Loss aversion": Albanians are quite easily negatively affected by short-term volatility, what makes them leave the investment too early (whilst the prospectus of these funds strongly recommend not to do that). Making future investment decisions based on previously suffered short-term losses, may limit the chances of making new good investments and benefiting from long-term investments or diversification
e. The ocurrence of the deposit crisis in 2002, showed that the the previous pyramid scheme crisis of 1997 had caused creation of strong psychological expectations into investors, thus implying the active presence of "Availibility." The current moderate impact, can be explained based on the slight indirect consequences the last 2008 global financial crisis had in our country
f. "Mental accounting": Individual investors in Albania fail to conceive the entirety of their investments, but see them as separate and independent accounts, without considering possible links between them. A thorough and comprehensive look at investor's portfolio can enhance the quality of his decisions.

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ANNEXES

Annex A - Semi-structured interview with the financial market expert, Mr. Elvin Meka.

1. "Representativeness" influences individual investment decision making on financial assets at a moderate level

EM:

> I agree with the conclusion that 'Representativeness' affects decision-making of the Albanian investor individual, and I even think that its impact may be even more than moderate. The "moderate" level belongs mainly to groups that having an above average level of financial literacy. Let us consider the behavior of Albanian investors towards Investment Funds: they tend to join the fund when the quota price continues to rise, as they feel optimistic about the continuation of its growth, but fear and withdraw their funds when the quota price falls, as a result of its short-term fluctuations.

2. "Overconfidence" affects individual investment decision-making on financial assets at a moderate level

EM:

> It is an impressive finding, taking into consideration the very modest level of education and financial literacy of the Albanian investor public. I personally believe that it is precisely because of this level of financial literacy that the average Albanian investor tends to be overconfident. Usually, a sophisticated investor exhibits this bias less, due to his objectivity deriving from the higher level of knowledge and experience with investments, which is not the case of the albanian individual investor.

3. "Availibility" affects individual investment decision making on financial assets at a moderate level

EM:

> I believe this finding is within the expectations of the Albanian investor. In the Albanian context, we can mention the case of banking panic in 2002, where a significant role in its creation was played by the psychological expectations the masses had created in them. These psychological expectations originated from the previous pyramid schemes crisis of 1997.

4. "Loss Aversion" affects individual investment decision making on financial assets at high level

EM:

> This finding is correct, as in investment philosophy in general any investor is generally risk averse. This is especially true in the case of the not sophisticated investor. Among the current investment options in the country, the Investment Funds market is typically characterized by the fast impact of short-term volatility. There is an early withdrawal of the Albanian investor from the investment (which is strongly not recommended by the Prospectus of these Funds) thus losing the opportunity for the benefit of long-term returns and diversification.

5. "Mental accounting" influences individual investment decision making on financial assets at high level

EM:

> I agree with this finding as well, as "mental accounting" is one of the most determinant psychological factors, which forces many investors to make bad choices or not leave in time from the wrong investments due to their lacking ability to overview a complete frame of the various individual investments of their portfolio.

6. "Herding" influences individual investment decision making on financial assets at a moderate level.

EM:

> As in the case of the 'Representativeness' conclusion, besides the fact that I fully agree with the conclusion that 'Herding' influences the decision-making of the Albanian individual investor, I think this factor should strongly influence the Albanian investor. The case of pyramid schemes, the massive withdrawal of deposits in 2008 and their redepositing in March 2009 (following the adoption of regulatory changes about deposit insurance), indicates the presence of the impact of this bias.

Annex B - Psychological biases

Please enter a number from 1 to 5 next to each statement to indicate the degree to which you agree or disagree with it, where:

A: Heuristics	
1. Before I make an investment I consider its past performance	1 2 3 4 5
2. I choose to invest in recent succesful investments and to avoid investing in recent poor performing investments	1 2 3 4 5
3. Ben likes opera and likes to visit arts gallery in his leisure time. As a child, he used to play chess with his friends and family. If I have to guess about his profession, I would say that he could rather be an instrumentist in a symphonic orchestra rather than a merchant	1 2 3 4 5
4. I have good knowledge of the albanian market	1 2 3 4 5
5. I am confident in my investing and better performing abilities than those of the others	1 2 3 4 5
6. I believe my investment performance will be better than that of the market	1 2 3 4 5
7. It is due to my knowledge and abilities that my last investment was succesful	1 2 3 4 5
8. To judge about the value of a real estate, I refer to the price set by the seller	1 2 3 4 5
9. I intend to sell my investment as soon as its price which has sharply fallen, rises at least the at the level of the purchasing price	1 2 3 4 5
10. If we toss a coin 6 times in a row, HTHTTH is more probable to happen rather than HHHHTT, where H-heads, T- tails	1 2 3 4 5
11. While playing in a slotting machine, my hope that this machinery makes me a winner, increases after each subsequent loss	1 2 3 4 5
12. As up to now all the babies born during the day have been females, i believe the next baby will be a boy	1 2 3 4 5
13. Because of the last month airplane crash, i am trying to avoid travelling by plane	1 2 3 4 5
14. Analysts' discussions and the information they offer in different media are an important source of to my investing decision - makimg	1 2 3 4 5
15. I prefer to invest in Albania rather than abroad due to my larger amount of information available to me	1 2 3 4 5
B: Persepktiva	
1. The more profit I make from my investments, the more risk I take in my future investments	1 2 3 4 5
2. After a loss-making investment, I am more cautious and take less risk in my future investments.	1 2 3 4 5
I bought an apartment in order to earn from reselling it	1 2 3 4 5
3. Situation (1) price drops. I don't sell the apartment	1 2 3 4 5
If the price continues to fall, I will regret not having sold it sooner	
4. Situation (2) price increases. I sell the apartment	
If the price keeps going up, I will regret my hurry to sell it	
5. I have 50,000 L (savings from work) in my wallet and I decide to play in a casino with some of it, where I win 30,000 L. I decide to try my luck a 2nd time. I no longer risk my savings but decide to play with the money earned from gambling	1 2 3 4 5
6. When I pay by credit or debit card, I am hesitate less and become more willing to pay more than when I pay in cash	1 2 3 4 5
C: Herding	
1. You have very little knowledge of a particular investment (e.g. investing in a Private Pension Fund) and are unsure how to make it. Other savers start investing in it. Now you are considering investing in a Private Pension Fund	1 2 3 4 5
2. The other savers are investing most of their money in a particular investment, for example in real estate. You are thinking of acting like them, as well	1 2 3 4 5
3. Other savers are suddenly withdrawing their bank deposits. You are thinking to act like them, too	1 2 3 4 5
4. My disappointment after losing money on an investment is slightly reduced if others experience the same loss	1 2 3 4 5
5. I would be very disappointed if my friends imitating the actions of other investors are making profits while I am losing, as I am not following the trend	1 2 3 4 5

(1) Disagree at all, (2) Disagree, (3) Not sure, (4) Disagree, (5) Completely agree