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Behavioral Investor Types and Financial Market Players in Oman

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Abstract

The most basic forces of stock market are supply and demand, which increases or decreases on the basis of information. The crucial point is that investor's perception is depending on the availability of information at a particular time. But it is very difficult to understand what they take from a piece of information, and the decision varies from person to person; hence, it is important to understand the behavior of investors in the stock market. In this context, this study is focusing on behavioral investor-type diagnosis testing among financial market players (FMPs) in Oman. The study conducted a review of behavioral types among stock market investors, and attempted to assess the influence of age and gender factors on investor bias. It classifies investor type biases according to the gender and age of respondents. This study employs primary data with a structured questionnaire distributed to an equal number of male and female stock market investors in Muscat Securities Market. The study used sample t-test, one-way ANOVA, CATPCA and ALSCAL to identify the significant difference among age, gender and experience of the respondents. The present study found that all of the investors are influenced by different cognitive biases and, moreover, it depends on investor's gender.

Keywords: Behavioral Bias, Behavioral Investor Types, Financial Market Players, Gender-Age Differentiation, Cognitive Bias

JEL Classification Code: G410, G12, D91

1. Introduction

A piece of information is nothing by itself, its importance depends on the perception by the user and his situation. Sometime, this piece of information will make a small or large change that depends on the perception of people, which will constitute their behavior. Hence, it could be said that behavior is a very important element in decision-making. In a deep sense, behavior is the result from the reaction of a person who uses a piece of information. The other factors such as validity of information, source of information, content of information, relevance of information, etc., are secondary elements. Many studies pointed out that the behavior of person is closely related to different types of bias, and some of the studies argued that biases can lead to error in the judgement. Pompian (2006)

argue that behavioral biases are organized errors in judgments, while Shefrin (2007) says that bias is nothing more than a tendency toward the error by the investors because of irrational decisions. Chira, Adams, and Thornton (2011) states that behavioral finance deals with how behavioral factors establish differences in the investors' decision-making process. Tversky and Kahneman (1974) describe that most of the decisions are based on intuitions and hunches. They further explain that investors are often relying on heuristic rules, which are useful in some cases, but sometime they lead them toward severe biased and irrational decisions. Brabazon (2000) says that most of the financial market decisions are irrational because these are affected by the investors' own emotions. Investors are irrational, and the markets may also be inefficient, so the investors in market places may deviate from their real values (Hirshleifer & Luo, 2001; Daniel, Hirshleifer, & Teoh, 2002; Subrahmanyam, 2007). Based on this review, it could be said that biases are strongly correlated with behavior and investment decision. In this context, this research focuses on behavioral biases in the Muscat Securities Market investors.

2. Conceptual Framework

The review of prior studies indicates that many researchers have examined behavioral bias and stock market investment decision, because the stock market is running through time and information, hence it is updating and

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changing continually. Based on this reason, investors are closely watching every movement of the stock market or collecting every piece of information, and they take what they want. This perception is working as a stimulator and encourages them to make investment decision. Therefore, it could be said that investor's perception is changing according to the information, and every time they are in the middle of unpredictability. This unpredictability is one of the most important challenges faced by the investor. Thus, it can be concluded that unpredictability will change the behavior of investor and their decisions. These reasons point to the importance of investor behavior analysis, hence, this research study has examined 14 cognitive biases and tried to explain whether the age and educational qualification are influencing the biases of Muscat Securities Market investors.

3. Literature Review

Research on behavioral bias is an interesting topic; Khanthavit (2020) has investigated the abnormal trading behavior of foreign investors during Covid-19. He found an abnormality in the foreign traders' working behavior, but it does not affect the market. Kahneman and Tversky's (1979) study on bias posits conservatism bias is the opposite of representativeness and, in their bias, individual will have the tendency to underestimate the latest piece of information and overestimate the base rates, which in turn triggers a base rate adjustment to be very slow when the latest information emerges (Edwards, 1968). Barberies, Sheifer, and Vishny (1998) also argue that, if the investors display a conservatism bias, they were frequently overstating their prior beliefs, which cause slow reaction of the investors to the new information. Hence it could be said that this type of bias causes slow reaction of investors when a new piece of information arrived. Representativeness bias is another cognitive bias. Gilovich (1983) said that this type of biases is an evaluation of the correspondence degree between the sample and the population, an instance and a category, an actor, in general, between an outcome and a model. Tversky said that people are affected by representativeness heuristics (Tversky, 1974). Roszczynska-Kurasinska et al. (2012) found a significant relationship between the short-term investors and the representativeness bias. Many studies found that purchase price is considered as a reference point for the investors when they are making an investment decision, therefore the majority of customers are experiencing anchoring bias (Mercer Consulting, 2006; Luong, Le, Ha, Doan, & Thi, 2011; Chandra & Kumar, 2011; Rejik & Boujelbene, 2013; Jayaraj, 2013).

The hindsight bias makes people look at past events and records and they believe there is a good chance they will happen again (Shiller, 2000). Biais and Weber (2008) found that investors with hindsight bias have very low portfolio performance. Another study has found strong evidence of a

relationship between hindsight bias and investor decision-making (Biais & Weber, 2008). Athur (2014) also found that there is a significant correlation between hindsight bias and investor decision-making. According to Pompian (2012), the illusion of control bias is encouraging the investors to conduct trade more than what is prudent and this leads to build an inadequately diversified portfolio. Several authors are proving that the illusion of control influences the investors' decision-making process (Durand, 2003; Chira, Adams, & Thornton, 2011; Bashir et al., 2013; Athur, 2014).

Many studies are documenting a strong relationship between framing bias and investors decision-making (Dungore, 2011; Mittal & Vyas, 2012; Mittal, 2010). Gamble (2008) found that the framing bias is making the investors take less risk, focussing more on the outcome of an individual stock. Pompian (2012) explained that financial market participants wrongly identify the risk tolerance. Nickerson (1998) argued that confirmation bias is pervasive and strong, hence he believes that confirmation bias is influencing decision-making. Mahina, Muturi, & Florence (2018) found that there is a positive linear relationship between confirmation bias and stock market investment. Hoffmann and Post (2014) found that investors' recent performance accurately reflected their investment skills and vice versa. Many studies argued that people judge the wisdom and competence of decision-makers based on the nature of the outcomes they obtain (Berg-Cross, 1975; Lipshitz, 1989; Mitchell & Kalb, 1981). According to Pompian (2017), recency bias is one of the cognitive bias, and investors are more depends on recent events rather than those in the near or distant past. Sunflower bias is not much tested in the stock market investment decision, but this type of bias is mentioned in the other disciplines such as management, i.e., sunflower management bias is mentioned by Boot et al. (2005) and Phan, Le, and Nguyen (2020). They studied the existence of the overconfidence bias focusing on ASEAN countries' stock markets, where they found its existence with more emphasis in Vietnam, Thailand and Singapore in their comparative study. Bharti and Kumar (2020) examined herd behavior, which is a prominent behavior, but not noticed at the time it is going on, like every behavioral bias among FMCGs stocks during the financial crisis, but they have found an absence in herd behavior among such goods during the market asymmetries, opening a wide discussion and a scope for future studies regarding the topic.

The review of prior studies indicates that all of the cognitive biases are significantly influencing the investors' decision-making except one, i.e., sunflower bias. Reviews indicating the sunflower bias is not much consider in the stock market investment field; in the management field it is called the sunflower management bias. In this context, this study examines the significant influence of gender and educational qualification on the investor behaviour.

4. Objectives of the Study

1. To conduct a detailed review of behavior types among stock market investors
2. To assess the influence of age and gender factors on the investor bias
3. To classify the investor type bias according to the gender and age of respondents

5. Methodology

The study was based on secondary and primary data. The secondary data were collected from Muscat Securities Market official website, published and unpublished thesis, articles, Ethos British Library, and SSRN. Primary data were collected from Muscat Securities Market investors. Here the main problem was unavailability of exact population list. Hence non-probability sample method was used to select the sample respondents. The first step was to decide equal sample distribution between gender and age group. Male and female are considered as two different blocks, the purpose was to increase the sample size. The second step was to decide the required sample size; Neyman (1934) sampling calculation was used to decide the sample size. Based on the calculation, it was decided to take 375 samples from male investors (125 male investors from each age group) and 375 samples from female investors (125 female investors from each age group), with 95% confidence level and 5% confidence interval. The third step was to distribute these sample size among three age categories.

6. Results and Discussion

The collected data was coded in Microsoft Excel, and SPSS software was used to analyze the coded data. The analysis was concentrated on two different purpose, i.e., to identify the significant difference among age, gender and experience, hence independent sample t-test, one-way ANOVA, and CATPCA; and use of ALSCAL to analyze the data.

Table1: Sample Distribution between Age and Gender

Category	Up to 25 age group	26-50 Age Group	Above 50 age group	Total
Male	125	125	125	375
Female	125	125	125	375
Total	250	250	250	750

6.1. Types of Cognitive Biases and Statements

6.1.1. Belief Perseverance Bias

Conservatism Bias: I don't easily change my views about investments once they are made.

Confirmation Bias: When an investment is not going well, I usually seek information that confirms I made the right decision about it.

Representativeness Bias: Many investment choices I make are based upon my knowledge of how similar past investments have performed.

Illusion of Control Bias: I am more likely to have a better outcome if I make my own investment choices rather than relying on others.

Hindsight Bias: When reflecting on past investment mistakes, I see that many could have been easily avoided.

Cognitive Dissonance Bias: When making investment decisions, I tend to focus on the positive aspect of an investment rather than on what might go wrong with the investment.

6.1.2. Information Processing Bias

Anchoring Bias: When thinking about selling an investment, the price I paid is a big factor I consider before taking any action.

Mental Accounting Bias: I tend to categorize my investments into various accounts, such as leisure, bill paying, college funding, and so on.

Framing Bias: I trust more the advice on investment from nationally advertised firms than from smaller, local firms.

Availability Bias: I often take action on a new investment right away, if it makes sense to me.

Self-Attribution Bias: I often find that many of my successful investments can be attributed to my decisions, while those that did not work out were based on the guidance of others.

Outcome Bias: What's most important is that my investments make money; I'm not very concerned with following a structured plan.

Recency Bias: When considering the track record of an investment, I put more weight on how it has performed recently rather than on how it has performed historically.

Sunflower Bias: When making investment decision, I tend to focus on the opinion of the majority.

6.2. Gender and Behavioral Bias of Muscat Securities Market Investors

Table 2 shows the opinion of male and female respondents regarding the influence of cognitive biases. Five-point scaling

techniques were used to collect the opinion from sample respondents. The scale options are definitely not influenced, probably not influenced, unsure, probably influenced and definitely influenced. Result indicates that male and female respondent's opinion mean score is higher than three, i.e., above 60% of the male and female respondents opine that these cognitive biases are influencing them while taking an investment decision.

6.2.1. Opinion of Male and Female Respondents Regarding Belief Perseverance Bias

Table 3 illustrates independent sample t-test, and the result has given three important test values, i.e., Levene's Test for Equality of Variances, Equal variances assumed t-test, and Equal variances not assumed t-test. Levene's Test for Equality of Variances was used to check whether there is any significant difference between two group variances, i.e., testing homogeneity condition. Result indicates that Levene's Test for Equality of Variances p-value is less than 5% significance regarding belief preference bias, hence it can be assumed that two groups are significantly different regarding variance, therefore, this is not considered as homogeneity. In this context, equal variance does not assume t-test was used to interpret further results. T-test result indicates that all belief preferences biases having p-value less than at 5% significance level ($p\text{-value} < 0.05$), hence it can be inferred that there is a significant difference between male and female respondents' opinion regarding the influence of belief preference biases.

6.2.2. Opinion of Male and Female Respondents Regarding Information Processing Bias

Table 4 illustrates the results regarding information processing biases. Here also, Levene's Test p-value is less than 5% significance value, hence it can be assumed that two groups of variance are not equal, thus the homogeneity condition was not met. So, equal variance does not assumed t-test was used to interpret the further result. T-test result indicates that all information processing biases having p-value is less than 5% significance level ($p\text{-value} < 0.05$), thus, it can be inferred that there is a significant difference between male and female respondents' opinion regarding the influence of information processing biases.

6.2.3. Opinion of Male and Female Respondents Regarding Information Processing Bias

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Table 2: Male and Female Respondents Opinion Regarding Types of Biases Influenced

Types of Biases		Male			Female		
		Mean	SD	Std. Err	Mean	SD	Std. Err
B1	Conservatism	3.59	1.073	.055	3.94	.527	.027
B2	Confirmation	3.63	.904	.047	3.78	.417	.022
B3	Representativeness	3.81	1.168	.060	4.06	.822	.042
B4	Illusion	3.53	1.194	.062	3.87	.726	.037
B5	Hindsight	3.57	1.086	.056	3.91	.410	.021
B6	Dissonance	3.55	1.180	.061	3.87	.714	.037
B7	Anchoring	3.62	1.100	.057	4.05	.436	.023
B8	Mental	3.99	1.073	.055	4.17	.706	.036
B9	Framing	3.54	1.146	.059	3.82	.713	.037
B10	Availability	3.61	1.285	.066	3.94	.804	.042
B11	Self-Attribution	3.82	1.095	.057	4.06	.668	.034
B12	Outcome	3.66	1.271	.066	4.36	.497	.026
B13	Recency	3.62	1.235	.064	4.10	.662	.034
B14	Sunflower	3.66	.987	.051	3.96	.869	.045

Table 3: Opinion of Male and Female Respondents Regarding Belief Perseverance Bias

			B1	B2	B3	B4	B5	B6	
Levene's Test for Equality of Variances		F	140.282	113.570	37.077	93.122	273.417	97.584	
		Sig.	.000	.000	.000	.000	.000	.000	
Equal variances assumed	t-test for Equality of Means	t	-5.702	-2.904	-3.472	-4.766	-7.383	-4.419	
		df	748	748	748	748	748	748	
		Sig. (2-tailed)	.000	.004	.001	.000	.000	.000	
		Mean Difference	-.352	-.149	-.256	-.344	-.443	-.315	
		Std. Error Difference	.062	.051	.074	.072	.060	.071	
		95% CI of the Difference	Lower	-.473	-.250	-.401	-.486	-.560	-.454
			Upper	-.231	-.048	-.111	-.202	-.325	-.175
Equal variances not assumed	t-test for Equality of Means	t	-5.702	-2.904	-3.472	-4.766	-7.383	-4.419	
		df	544.453	526.544	671.339	617.202	478.512	615.473	
		Sig. (2-tailed)	.000	.004	.001	.000	.000	.000	
		Mean Difference	-.352	-.149	-.256	-.344	-.443	-.315	
		Std. Error Difference	.062	.051	.074	.072	.060	.071	
		95% C I of the Difference	Lower	-.473	-.250	-.401	-.486	-.560	-.455
			Upper	-.231	-.048	-.111	-.202	-.325	-.175

Table 4: Opinion of Male and Female Respondents Regarding Information Processing Bias

			B7	B8	B9	B10	B11	B12	B13	B14	
Levene's Test for Equality of Variances		F	210.943	8.917	70.991	90.594	44.547	215.11	133.585	16.612	
		Sig.	.000	.003	.000	.000	.000	.000	.000	.000	.000
Equal variances assumed	t-test for Equality of Means	t	-7.027	-2.733	-3.902	-4.293	-3.665	-9.915	-6.598	-4.399	
		df	748	748	748	748	748	748	748	748	
		Sig. (2-tailed)	.000	.006	.000	.000	.000	.000	.000	.000	
		Mean Difference	-.429	-.181	-.272	-.336	-.243	-.699	-.477	-.299	
		Std. Error Difference	.061	.066	.070	.078	.066	.070	.072	.068	
		95% CI of the Difference	Lower	-.549	-.312	-.409	-.490	-.373	-.837	-.619	-.432
			Upper	-.309	-.051	-.135	-.182	-.113	-.560	-.335	-.165
Equal variances not assumed	t-test for Equality of Means	t	-7.027	-2.733	-3.902	-4.293	-3.665	-9.915	-6.598	-4.399	
		df	488.76	646.56	626.04	628.01	618.36	485.81	572.918	736.27	
		Sig. (2-tailed)	.000	.006	.000	.000	.000	.000	.000	.000	
		Mean Difference	-.429	-.181	-.272	-.336	-.243	-.699	-.477	-.299	
		Std. Error Difference	.061	.066	.070	.078	.066	.070	.072	.068	
		95% CI of the Difference	Lower	-.549	-.312	-.409	-.490	-.373	-.837	-.619	-.432
			Upper	-.309	-.051	-.135	-.182	-.113	-.560	-.335	-.165

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		Sig.	.000	.003	.000	.000	.000	.000	.000	.000	.000
Equal variances assumed	t-test for Equality of Means	t	-7.027	-2.733	-3.902	-4.293	-3.665	-9.915	-6.598	-4.399	
		df	748	748	748	748	748	748	748	748	
		Sig. (2-tailed)	.000	.006	.000	.000	.000	.000	.000	.000	
		Mean Difference	-.429	-.181	-.272	-.336	-.243	-.699	-.477	-.299	
		Std. Error Difference	.061	.066	.070	.078	.066	.070	.072	.068	
		95% CI of the Difference	Lower	-.549	-.312	-.409	-.490	-.373	-.837	-.619	-.432
			Upper	-.309	-.051	-.135	-.182	-.113	-.560	-.335	-.165
Equal variances not assumed	t-test for Equality of Means	t	-7.027	-2.733	-3.902	-4.293	-3.665	-9.915	-6.598	-4.399	
		df	488.76	646.56	626.04	628.01	618.36	485.81	572.918	736.27	
		Sig. (2-tailed)	.000	.006	.000	.000	.000	.000	.000	.000	
		Mean Difference	-.429	-.181	-.272	-.336	-.243	-.699	-.477	-.299	
		Std. Error Difference	.061	.066	.070	.078	.066	.070	.072	.068	
		95% CI of the Difference	Lower	-.549	-.312	-.409	-.490	-.373	-.837	-.619	-.432
			Upper	-.309	-.051	-.135	-.182	-.113	-.560	-.335	-.165

6.3. Age and Behavioral Bias of Muscat Securities Market Investors

The significant difference among three age group is analyzed in this part with the identified behavioral biases each.

6.3.1. Significant Difference Among Three Age Group Respondents Opinion Regarding Belief Perseverance Bias

Table 5 shows one-way ANOVA test result for the purpose of finding significant difference among the three age group respondents' opinion regarding belief perseverance bias. Result indicates that five biases have p-value greater than 5% significance level, i.e., Conservatism (F=1.005, p-value=.390), Confirmation (F=1.442, p-value=.229), Representativeness (F=.153, p-value=.928), Illusion (F=.627, p-value=.598), and Hindsight (F=.457, p-value=.713). Hence, it can be inferred that there is no significant difference among three age group respondent's opinion regarding these five biases. The last bias has p-value, which is less than at 5% significance level, i.e., dissonance (F=3.486, p-value=.016). This indicates that there is a significant difference among three age group respondents' opinion regarding dissonance bias.

6.3.2. Significant Difference Among Three Age Group Respondents Opinion Regarding Information Processing Bias

Table 6 shows one-way ANOVA test results for the purpose of finding significant difference among the three age group respondents' opinion regarding information processing bias. Result indicates that six biases having p-value greater than 5% significance level, i.e., Anchoring (F=2.416, p-value=.065), Mental (F=.494, p-value=.686), Framing (F=.791, p-value=.499), Availability (F=1.016, p-value=.385), Self-Attribution (F=2.158, p-value=.092), and Outcome (F=.205, p-value=.893). Hence, it can be inferred that there is no significant difference among three age group respondents' opinion regarding these six biases. The last two biases have p-value less than 5% significance level, i.e., Recency (F=2.858, p-value=.036) and sunflower (F=3.313, p-value=.020). This indicates that there is a significant difference among three age group respondents' opinion regarding recency and sunflower bias

Here the one-way ANOVA result indicates that three biases are statistical significant, hence it is very important to answer which of the age group is significantly different from each other; multiple comparison tests were applied for identifying difference between each group.

Table 5: Respondents' Opinion Regarding Belief Perseverance Bias

		Sum of Squares	df	Mean Square	F	Sig.
Conservatism	Between Groups	2.245	3	.748	1.005	.390
	Within Groups	555.387	746	.744		
	Total	557.632	749			
Confirmation	Between Groups	2.163	3	.721	1.442	.229
	Within Groups	372.935	746	.500		
	Total	375.099	749			
Representativeness	Between Groups	.477	3	.159	.153	.928
	Within Groups	774.451	746	1.038		
	Total	774.928	749			
Illusion	Between Groups	1.893	3	.631	.627	.598
	Within Groups	750.801	746	1.006		
	Total	752.695	749			
Hindsight	Between Groups	.992	3	.331	.457	.713
	Within Groups	540.000	746	.724		
	Total	540.992	749			
Dissonance	Between Groups	10.090	3	3.363	3.486	.016
	Within Groups	719.702	746	.965		
	Total	729.792	749			

Table 6: Age group Respondents' Opinion Regarding Information Processing Bias

		Sum of Squares	df	Mean Square	F	Sig.
Anchoring	Between Groups	5.371	3	1.790	2.416	.065
	Within Groups	552.795	746	.741		
	Total	558.167	749			
Mental	Between Groups	1.237	3	.412	.494	.686
	Within Groups	622.278	746	.834		
	Total	623.515	749			
Framing	Between Groups	2.206	3	.735	.791	.499
	Within Groups	692.994	746	.929		
	Total	695.200	749			
Availability	Between Groups	3.581	3	1.194	1.016	.385
	Within Groups	876.787	746	1.175		
	Total	880.368	749			
Self-Attribution	Between Groups	5.387	3	1.796	2.158	.092
	Within Groups	620.667	746	.832		
	Total	626.055	749			
Outcome	Between Groups	.650	3	.217	.205	.893
	Within Groups	787.264	746	1.055		
	Total	787.915	749			
Recency	Between Groups	8.826	3	2.942	2.858	.036
	Within Groups	768.028	746	1.030		
	Total	776.855	749			
Sunflower	Between Groups	8.720	3	2.907	3.313	.020
	Within Groups	654.395	746	.877		
	Total	663.115	749			

Table 7: Multiple Comparisons test

Dependent Variable	(I) EducQuali	(J) EducQuali	Mean Difference (I-J)	Std. Error	Sig.
Dissonance	Up to 25 age	26-50	-.274*	.101	.035
		Above 50	-.356*	.114	.010
Recency	Up to 25 age	26-50	-.233	.105	.115
		Above 50	-.292	.118	.045
Sunflower	Up to 25 age	26-50	-.237	.097	.038
		Above 50	-.165	.109	.428

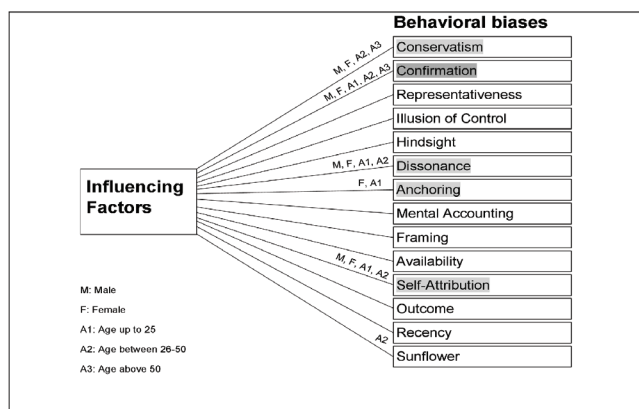


Figure 1: Multi-Dimensional Approach – Most influencing Factors

Result in Table 7 indicates that up to 25 years old age group respondent’s opinion is significantly different from 26-50 age group and above 50 age group regarding dissonance bias, in the case of recency; the same group opinion is different from above 50 years old age group, and again up to 25 years old age group opinion is significantly different from 26-50 age group regarding sunflower bias.

6.4. Multi-dimensional Scaling (ALSCAL)

An attempt was made to find which of the behavioral biases are most dominant among the sample respondents with regard to their age and gender using Euclidean Distance Model. Two-dimension check was conducted to finalize the outcome, and the factors that produce both dimensions positive were only taken as significantly influencing factors. Figure 1 is showing the high influencing behavioral biases on the respondents at different gender and age.

The result shows that the most dominant behavioral bias is confirmation bias, where most of the respondents in different category are falling in this group. Along with confirmation bias, the behavioral biases, which have influence over the sample respondents, are Conservatism bias, Dissonance bias, Anchoring bias, and Self-attribution bias.

This analysis also specifies that there is no prominent influence for the rest of the behavioral bias, like Representativeness bias, Illusion of Control bias, Hindsight bias, Mental Accounting bias, Framing bias, Availability bias, Outcome bias, Recency bias and Sunflower bias, among the sample respondents.

7. Conclusion

The present study concentrated on gender and age-wise investor type diagnosis among Muscat Securities Market investors. The study topic was generated from a detailed review of prior research. Based on the literature review, the study has examined 14 cognitive biases and analyzed whether the influence of biases depends on investor’s gender and age. The study results found that stock market investors’ bias depends on their gender and not the age of investors. Hence, it can be concluded that gender is the important factor that related to the influence of cognitive biases. Also, all the categories in gender and age of sample respondents have an influence on confirmation bias in their financial decisions.

Major findings of the study include:

1. The majority of male and female respondents are influenced by all cognitive biases.
2. There is a significant difference between male and female opinion regarding the influence of all cognitive biases, which indicates that influence of cognitive biases depends on the gender of respondents.
3. There is no significant difference among three age group respondents’ opinion regarding cognitive biases, which means that influence of cognitive biases are not depends on the age of investors.
4. The influence of dissonance bias, recency bias, and sunflower bias influence is dependent on the age of investor.
5. Based on the result from ALSCAL, it was found that Confirmation, Conservatism, Dissonance, and Self Attribution are the most influencing bias for male investors, whereas Confirmation, Conservatism, Dissonance, Self-Attribution and Anchoring are the most influencing bias for female investors.

6. Confirmation, Dissonance, Anchoring, and Self Attribution biases have most influence on cognitive bias for up to 25 years old investors.
7. Confirmation, Conservatism, Dissonance, Self-Attribution, and Sunflower have the most influence on cognitive bias for 26-50 years old investors.
8. In the case of above 50 years old investors, it was found that Confirmation and Conservatism, are the most influencing biases

As earlier mentioned, stock market investment depends on time and information, i.e., how the investor takes financial investment decision based on the available information at the time. Hence, it could be said that information is one of the important stimuli that encourage taking investment decision; the problem is what the investors take out of the information and what are the factors, which influenced their perception regarding information. In this context, the investors should be aware of the different types of cognitive biases, because biases may lead them to much better or worst position. The present study found that the investors are influenced by different cognitive biases and it depends on the gender of the investor.

References

- Athur, A. (2014). Effect of behavioral biases on investment decisions of individual investors in Kenya. A research project submitted in University of Nairobi. <http://erepository.uonbi.ac.ke>
- Barberis, N., Shleifer, A. & Vishny, R. (1998). A Model of Investor Sentiment. *Journal of Financial Economics*, 49, 307–343. [https://doi.org/10.1016/S0304-405X\(98\)00027-0](https://doi.org/10.1016/S0304-405X(98)00027-0)
- Bashir, T., Javed, A., Ali, U., Meer, U. I., & Naseem, M. M. (2013). Empirical Testing of Heuristics Interrupting the Investor's Rational Decision Making. *European Scientific Journal*, 9(28), 432–444. <https://doi.org/10.19044/esj.2013.v9n28p%25p>
- Berg-Cross, L. G. (1975). Intentionality, degree of damage, and moral judgments. *Child Development*, 46(4), 970–974. DOI: 10.2307/1128406
- Bharti, B., & Kumar, A., (2020). Herding in Fast Moving Consumer Group Sector: Equity Market Asymmetry and Crisis. *Journal of Asian Finance, Economics and Business*, 7(9), 39–49. <https://doi.org/10.13106/jafeb.2020.vol7.no9.039>
- Biais, B., & Weber, M (2008). Hindsight bias, risk perception and investment performance Hindsight bias, risk perception and investment performance. *Psychology*, 1–26.
- Brabazon, T. (2000). Behavioural finance: a new sunrise or a false dawn? In: *CoIL Summer School 2000*, University of Limerick: Department of Accountancy, University College Dublin, pp. 1–8.
- Chandra, A., & Kumar, R. (2011). Determinants of Individual Investor Behaviour: An Orthogonal Linear Transformation Approach. *MPRA Working Paper*. <https://mpra.ub.uni-muenchen.de/29722/>
- Charles G. Lord, L. R., & Lepper, M. R. (1979). Biased Assimilation and Attitude Polarization: The Effects of Prior Theories on Subsequently Considered Evidence. *Journal of Personality and Social Psychology*, 37(11), 2098–2109. DOI: 10.1037/0022-3514.37.11.2098
- Chira, I., Adams, M., & Thornton, B. (2011). Behavioral Bias Within the Decision-Making Process. *Journal of Business & Economics Research*, 6(8), 10–20. DOI: 10.19030/jber.v6i8.2456
- Daniel, K., Hirshleifer, D., & Teoh, S. H. (2002). Investor Psychology in Capital Markets: Evidence and Policy Implications. *Journal of Monetary Economics*, 49, 139–209. [https://doi.org/10.1016/S0304-3932\(01\)00091-5](https://doi.org/10.1016/S0304-3932(01)00091-5)
- Dungore, P. (2011). An Analytical Study of Psychological Facets Affecting Rationality: From the Investors' Perspective. *IUP Journal of Behavioral Finance*, 8(4), 40–62. <https://ssrn.com/abstract=2134757>
- Durand, N. S. (2008). An intimate portrait of the individual investor. *Journal of Behavioral Finance*, 9(4), 193–208. <https://doi.org/10.1080/15427560802341020>
- Edwards, W. (1968). Conservatism in human information processing. In: B. Kleinmütz (Ed.), *Formal Representation of Human Judgment*. New York, NY: John Wiley & Sons, Inc.
- Gilovich, T. E. A. (1983). Biased evaluation and persistence in gambling. *Journal of Personality & Social Psychology*, 40, 797–808. DOI: 10.1037/0022-3514.44.6.1110
- Hirshleifer, D. (2001). Investor's Psychology and Asset Pricing. *The Journal of Finance*, 56, 1533–1597. <https://doi.org/10.1111/0022-1082.00379>
- Jayaraj, D. (2013). The Factor Model for Determining the Individual Investment Behavior in India. *IOSR Journal of Economics and Finance*, 1(4), 21–e32. <http://iosrjournals.org/iosr-jef/papers/vol1-issue4/D0142132.pdf>
- Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, 47(2), 3–291. DOI: 10.2307/1914185
- Khanthavit, A. (2020). Foreign investors' abnormal trading behavior in the time of COVID-19. *Journal of Asian Finance, Economics and Business*, 7(9), 63–74. <https://doi.org/10.13106/jafeb.2020.vol7.no9.063>
- Lee, K., Miller, S., Velasquez, N., & Wann, C. (2013). The Effect of Investor Bias and Gender on Portfolio Performance and Risk. *International Journal of Business & Finance Research*, 7(1), 1–16. <https://ssrn.com/abstract=2148664>
- Lipshitz, R. (1989). Either a medal or a corporal: The effects of success and failure on the evaluation of decision making and decision makers. *Organizational Behavior & Human decision Processes*, 44, 380–395. [https://doi.org/10.1016/0749-5978\(89\)90015-0](https://doi.org/10.1016/0749-5978(89)90015-0)
- Luong, L. P., & Hu, D. T. T. (2011). *Behavioral Factors Influencing Individual Investors Decision-Making and Performance*. A

- Survey at the Ho Chi Minh Stock Exchange*. Master thesis, UMEA School of Business.
- Mahina, J. N., Muturi, W., & Florence, M., (2018). Effect of Self-Attribution Bias on Investment in the Rwandan Stock Market. *Global Journal of Management and Business Research*, 18(2), 54–63.
- Mitchell, T. R., & Kalb, L. S. (1981). Effects of outcome knowledge and outcome valence on supervisors' evaluations. *Journal of Applied Psychology*, 66, 604–612. <https://psycnet.apa.org/doi/10.1037/0021-9010.66.5.604>
- Mittal, M. (2010). Study of differences in behavioral biases in investment decision-making between the salaried and business class investors. *IUP Journal of Behavioral Finance*, 74, 20–34. <https://ssrn.com/abstract=1751855>
- Mittal, M., & Vyas, R. (2012). A study of psychological reasons for gender differences in preferences for risk and investment decision making. *IUP Journal of Behavioral Finance*, 8(3), 45–60. <https://ssrn.com/abstract=2098224>
- Neyman, J. (1934). On the two different aspects of the representative method: The method of stratified sampling and the method of purposive selection. *Journal of the Royal Statistical Society*, 97(4), 557–625. DOI: 10.2307/2342192
- Phan, D.T.T., Le, V.H.T., & Nguyen, T.T.H., (2020). Overconfidence Bias, Comparative Evidences between Vietnam and Selected ASEAN Countries. *Journal of Asian Finance, Economics and Business*, 7(3), 101–113. <https://doi.org/10.13106/jafeb.2020.vol7.no3.101>
- Pompian, M. (2006). *Behavioral Finance and Wealth Management. How to build optimal portfolios that accounts for investors biases*. Hoboken, NJ: John Wiley & Sons, Inc.
- Pompian, M. (2012). *Behavioral finance and investor types: Managing behavior to make better investment decisions*. Hoboken, NJ: John Wiley & Sons, Inc
- Pompian, M. (2017). Risk Tolerance and Behavioral Finance. <https://webcache.googleusercontent.com/search?q=cache:4LrvAwXWsf0J>
- Rekik, Y. M., & Boujelbene, Y. (2013). Determinants of Individual Investors Behaviors: Evidence from Tunisian Stock Market. *IOSR Journal of Business and Management*, 8(2), 109–119.
- Roszczyńska-Kurasinska, M., Nowak, A., Kamieniarz, D., Solomon, S., Andersen, J. V., & Sánchez, A (2012). Short- and Long-Term Investor Synchronization Caused by Decoupling. *PLOS ONE*, 7(12), e50700. <https://doi.org/10.1371/journal.pone.0050700>
- Shefrin, H. (2007). *Behavioral Corporate Finance. Decisions that Create Value*. New York, NY: McGraw- Hill/ Irwin.
- Shiller, R. J. (2000). *Irrational Exuberance*. Princeton, NJ: Princeton University Press.
- Subash, R. (2012). Role of Behavioral Finance in Portfolio Investment Decisions: Evidence from India. from <http://ies.fsv.cuni.cz/default/file/download/id/20803>
- Subrahmanyam, A. (2007). Behavioral Finance: A Review and Synthesis. *European Financial Management*, 14, 12–29. <https://doi.org/10.1111/j.1468-036X.2007.00415.x>
- Thaler, R. H. (1999). Mental accounting matters. *Journal of Behavioral Decision Making*, 12(3), 183–206. [https://doi.org/10.1002/\(SICI\)1099-0771\(199909\)12:3<183::AID-BDM318>3.0.CO;2-F](https://doi.org/10.1002/(SICI)1099-0771(199909)12:3<183::AID-BDM318>3.0.CO;2-F)
- Tversky, A., & Kahneman, D. (1974). Judgment under Uncertainty: Heuristics and Biases. *American Association for the Advancement of Science*, 185, 1124–1131. <https://www.jstor.org/stable/1738360>