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HOW BEHAVIOURAL BIASES AFFECT INVESTMENT DECISION ? EVIDENCE FROM AMMAN STOCK EXCHANGE

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ABSTRACT

This study investigates the effect of behavioral biases on investment decision in Amman Stock Exchange. In specific, the effects of overconfidence bias, familiarity bias, loss aversion bias, disposition bias, availability bias, representativeness bias, confirmation bias and herding bias are investigated. Moreover, the study inspects whether the effect of behavioral biases on investment decision differs between males and females. To accomplish the objectives of the study, 300 questionnaires are distributed. Based on the answers of 236 respondents, the t-statistic and the Chi-square test show that investors are highly affected by all the investigated biases. However, no statistically significant differences are found between males andfemales.

KEYWORDS: Behavioral Biases, Investment Decision, Gender, Overconfidence, Familiarity, Loss Aversion, Disposition, Availability, Representativeness, Confirmation, Herding, Amman Stock Exchange.

INTRODUCTION

Behavioral finance is defined as the study of how investors systematically make errors in judgment, or “mental mistakes” (Fuller, 2000). Thus, Behavioral biases denote to the irrationality in decision making. The empirical evidence in the behavioral finance literature shows that investors do not act rationally. For example, Barberis and Thaler (2003) give a good quality summary of models that try to explicate the equity premium puzzle; excess volatility, excessivetrading, and stock return predictability by applying Prospect Theory of Kahneman and Tversky (1979). Also, Daniel et al. (2002) sustain that markets are not efficient and investor biases have an effect on security prices virtually. Black (1986), De Long et al. (1990), Shleifer and Vishny (1997), Barberiset al. (2001), Hirshleifer (2001), Daniel et al. (2002), and Subrahmanyam (2007) argue that investors are not rational and markets may not be efficient. Hence prices may extensively deviate from fundamental values due to the existence of irrational investors. This can lead us to the fact that in the real market place, investors are tending to beirrational.

Research in psychology has documented a range of decision-making behavioral biases. These biases can affect all types of decision-making, but have particular implications in relation to money and investing. The biases relate to how we process information to reach decisions and the preferences we have. The importance of studying such topic comes from the consequences that these behavioral biases could have on the investors’ gains and losses and on the stock market as a whole. For example, the overconfidence bias can lead investors to pay too much brokerage costs and taxes and make them more vulnerable to high losses because of having too much trades and taking too much risk in the investments which they are overconfident about. The herding behavior could explain the bubbles and bubble bursts in the stock market as a whole

because of the lack of individuality in decision making. The representativeness bias could results in purchasing overpriced stocks because of the tendency to associate new event to a known event. The disposition bias could result in reducing investors' returns because it indicates selling winners too soon and holding losers toolong.

This study investigates the effect of behavioral biases on investment decision for 236 investors in Amman Stock Exchange. In Addition, it tests whether gender matters in such issue. In fact we focus on eight well-known behavioral biases that are found to affect investment decisions inother developed and emerging stock markets. These biases are overconfidence bias, familiarity bias, loss aversion bias, disposition bias, availability bias, representativeness bias, herding bias and confirmation bias. To the best of author's knowledge, this is the first study in Jordan that tackles such important topic. The remaining of the study is organized as follows: Section 2 defines the examined behavioral biases. Section 3 reviews the related literature. Section 4 describes data and methodology. Section 5 reports the results of analysis. Section 6 concludes.

BEHAVIORALBIASES

Overconfidencebias

Overconfidence is defined as "the investors tendency to overestimate the precision of their knowledge about the value of security", (Odean, 1998a). Investors who have this bias are overconfident of their abilities, knowledge, and future expectations which causes them trade excessively at a lower level of expected utility (Odean, 1998b). Glaser and Weber (2003) have divided overconfidence into miscalibration (causing higher trading activities), the better-than- average effect (investors expect that they have skills better than average skills) and illusion-of- control (the tendency of people to think they can affect outcomes but in reality they cannot affect the outcomes of their decisions). Barber and Odean (1999) find that investors who have high confidence in their trading skills often have high trading volume, with a negative effect on their returns. Overconfidence is also supported by 'self-attribution biases. This means that investors attribute the positive results to their abilities and skills, while attributing the negative consequences to bad luck.

Representativeness Bias

It is introduced as one of the classical heuristics by Kahneman and Tversky (1972). Gilovichet al. (2002) define representativeness as "an assessment of the degree of correspondence between a sample and a population, an instance and a category, an act and an actor or, more generally, between an outcome and a model." Representativeness can be reduced to 'similarity' (Kahneman and Tversky, 1972). It is concerned with determining conditional probabilities. Thus, representativeness results in investors labeling an investment as good or bad based on its recent performance. Consequently, they buy stocks after prices have risen expecting those increases to continue and ignore stocks when their prices are below their intrinsicvalues.

Disposition Bias

Closely related to regret aversion is the disposition effect, which refers to the tendency of selling stocks that have appreciated in price since purchase ("winners") too early and holding on to losing stocks ("losers") too long. According to Shefrin and Statman (1985), the disposition effect indicates that individuals tend to sell winners' investments too quickly and hold losers' investments too long. The disposition effect is consistent with the prospect theory by Kahneman and Tversky (1979). It challenges the expected utility theory of Von Neumann and Morgenstern (1944). Therefore, it suggests

that people make their decisions based on gains or losses from that value. Thus, they are risk averse when they are winning and risk seeking when they are losing. The disposition effect is harmful to investors because it can increase the capital gains taxes that investors pay and can reduce returns even before taxes.

FamiliarityBias

This bias occurs when investors have a preference toward familiar investments despite the seemingly obvious gains from diversification. Investors display a preference for local assets with which they are more familiar (local bias) as well portfolios tilted toward domestic securities (home bias). Foad (2010) argues that "researchers have studied familiarity bias in both the domestic (local bias) and international (home bias) settings. In both cases, familiarity bias occurs when investors hold a portfolio biased toward "familiar" assets compared to an unbiased portfolio derived from a theoretical model or empirical data". In other words, it happens when some investors are too concentrated on opportunities in their own countries, or in companies that they work in. They are more familiar with and sure about local investmentopportunities.

ConfirmationBias

Confirmation bias (confirmatory bias or my-side bias) is a tendency to confirm one's believes and hypotheses regardless of whether the information is true, which leads to statistical errors (Plous,1993). Confirmation bias can cause investors to seek out only information that confirms their beliefs about an investment that they have made and not to seek out information that may contradict their beliefs (fall, 2000). This confirmation bias would make them more overconfident and adversely affect their investment performance. Pompian (2006) suggests that confirmation bias can lead investors to be overconfident; therefore their investment strategies will lose money.

Loss aversionBias

Loss aversion bias is developed by Kahneman and Tversky (1979) as a part of the original prospect theory. It is the tendency that people generally feel a stronger impulse to avoid lossesthan to acquire gains. Behavioral finance theory suggests that investors are more sensitive to loss than to risk and return. "Some estimates suggest people weigh losses more than twice as heavily as potential gains" (Montier, 2002). Loss aversion includes another idea that is investors try to avoid closing on loss, and prefer to close on profit (Barber &Odean,1999).

AvailabilityBias

Availability bias happens when a decision maker depends on knowledge that is readily available. It refers to people's tendency to determine the likelihood of an event according to the easiness of recalling similar instances and, thus, to overweight current information as opposed to processing all relevant information (Kliger and Kudryavtsev, 2010). Its estimation depends on frequency, probability, and causality relationships that relies on how easily information is recalled from memory (Tversky&Kahneman, 1974). Researchers find some evidence suggests that recently observed or experienced events strongly influence decisions (Shefrin, 2000).

Herding Bias

Herding in financial markets can be defined as mutual imitation leading to a convergence of action (Hirshleifer and Teoh, 2003). This is the most common mistake where investors tend to follow the investment decisions taken by the majority. Herd behavior is the tendency individuals have to mimic the actions of a large group irrespective of whether or

not they would make the decision individually. One reason is that people are sociable and generally tend to seek acceptance from the group rather than being a standout. Another reason is that investors tend to think that it is unlikely that a large group could be wrong. This could make them follow the herd under the illusion that the herd may know something they do not know.

LITERATURE REVIEW

Several researchers worldwide have investigated the effect of behavioral biases on investment decision and whether this effect differs between males and females. Barber and Odean (2001) find that men are more overconfident than women as they trade more and earn lower returns in USA. Chen et al. (2007) conduct a study on the Chinese stock market and find that investors are affected by the disposition bias. Barber &Odean (2008) show that investors tend to consider stocks that have recently caught their attention in making purchase decisions confirming the availability bias in US stock exchanges. Park et al. (2010) find a significant confirmation bias in Korea that makes investors more overconfident and adversely affect their investments. Fish (2012) finds that females are more risk averse than males, even when controlling for financial knowledge and experience in USA. Based on a survey, Rekik and Boujelbene (2013) find that Tunisian investors' behaviors are subject to five behavioral biases: representativeness, herding attitude, loss aversion, mental accounting, and anchoring. Moreover, they find that gender, age and experience have an interaction with behavioral financial factors in investment decisions. On the other hand, Bashir et al. (2013) conclude that there is no significant difference between the responses of male and female decision making regarding overconfidence bias in Pakistan.

Mobareket al. (2014) report a significant common herding behavior across a large number of markets in Europe. Onsomu (2014) finds that investors are affected by availability bias, representativeness bias, confirmation bias and disposition bias in Kenya. However, no significant effect of overconfidence bias has been found. Moreover, Onsomu (2014) demonstrates that gender does not matter in this topic. Finally, Rostami and Dehaghani (2015) document a significant relationship between behavioral biases (overconfidence, ambiguity-aversion and loss- aversion) and investing in Tehran stock exchange.

DATA AND METHODOLOGY

A questionnaire is used to answer the questions of the study. 300 questionnaires are distributed for investors in Amman Stock Exchange and 236 ones have been returned back. The response rate is 78.7%. The answers of the 236 respondents are analyzed using frequencies, Chi-square test and t-test. The questionnaire consists of two parts, part one asks about the demographic characteristics of the investors and part two consists of eight paragraphs each asking about a certain behavioral bias. For more details see the appendix of thestudy.

RESULTS OF ANALYSIS

Table 1 describes the demographic characteristics of the respondents of the study. 76% of the respondents are males while 24% of them are females. 21% of the respondents are between 18 and 30 years old, 35% of them are between 31 and 40, 22% are between 41 and 50, 18% are between 51 and 60 and only 4% are over 60. None of the respondents are uneducated, 18% of them got high school, 20% got diploma, 40% are bachelor degree holders and 22% are highly educated. With respect to their occupation, the results show that 42% of the respondents have their own business, 39% of them work in the private sector while 13% work in the public sector. On the basis of investment period, the results

demonstrate that around 40% of the respondents have invested in ASE for less than 3 years, 26% of them have invested for 3-5 years, 21% have invested for 5-10 years and 13% have invested for more than 10 years.

Table 1: The Demographic Characteristics of the Respondents of the Study

Sex	Frequency	Percent	Valid Percent	Cumulative Percent
Males	179	75.8	75.8	75.8
Females	57	24.2	24.2	100.0
Age	Frequency	Percent	Valid Percent	Cumulative Percent
18-30	49	20.8	20.8	20.8
31-40	83	35.2	35.2	56.0
41-50	53	22.5	22.5	78.5
51-60	42	17.8	17.8	96.3
60 or more	9	3.7	3.7	100.0
Educational Background	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
High school	43	18.2	18.2	18.2
Diploma	47	19.9	19.9	38.1
Bachelor	94	39.8	39.8	77.9
Higher Education	52	22.1	22.1	100.0
Occupation	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
Public sector	30	12.7	12.7	12.7
Private sector	91	38.6	38.6	51.3
Free work	99	41.9	41.9	93.2
Other	16	6.8	6.8	100.0
Investment Period	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
less than 3	95	40.3	40.3	40.3
3-5.	61	25.8	25.8	66.1
5-10.	49	20.7	20.7	86.8
More than 10	31	13.2	13.2	100.0

Table 2 reports the frequencies of “bias” and “no bias” answers of the study sample. The results show that the answers of 81% of the respondents confirm the familiarity bias and representativeness bias when investment decision is taken. Similarly, 82% of the sample investors are affected by availability bias and overconfidence bias. Moreover, the results indicate that around 84%, 79%, 66% and 62% of the investors who have been questioned are affected by confirmation bias, loss aversion bias, herding bias and disposition bias respectively, when they make their investmentdecisions.

Table 2: The Frequencies of “Bias” and “No Bias” Answers of the Study Sample.

Familiarity Bias	Frequency	Percent	Valid Percent	Cumulative Percent
NO BIAS	45	19.1	19.1	19.1
BIAS	191	80.9	80.9	100.0
Representativeness bias	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
NO BIAS	45	19.1	19.1	19.1
BIAS	191	80.9	80.9	100.0
Availability bias	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
NO BIAS	42	17.8	17.8	17.8
BIAS	194	82.2	82.2	100.0
Confirmation bias	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
NO BIAS	38	16.1	16.1	16.1
BIAS	198	83.9	83.9	100.0
Disposition bias	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
NO BIAS	90	38.1	38.1	38.1
BIAS	146	61.9	61.9	100.0

Overconfidence Bias	Frequency	Percent	Valid Percent	Cumulative Percent
NO BIAS	42	17.8	17.8	17.8
BIAS	194	82.2	82.2	100.0
Loss aversion	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
NO BIAS	50	21.2	21.2	21.2
BIAS	186	78.8	78.8	100.0
Herding bias	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
NO BIAS	80	33.9	33.9	33.9
BIAS	156	66.1	66.1	100.0

Table 3 reports the Chi-square statistic of behavioral biases for all respondents. The results show that all the investigated behavioral biases significantly affect the investment decision for the study sample. All the Chi-square values are statistically significant at 1% significance level. Thus, Jordanian investors seem to be affected by all these biases when they take their investment decisions. Table 4 shows the t-test of behavioral biases for all respondents. The results are consistent with those of the Chi-square test in Table 3. All the t-values are highly statistically significant confirming the vital effect of all the examined behavioral biases on investment decision in ASE. Our results are consistent with (Chen et al., 2007; Barber and Odean, 2008; Mobareket al., 2014; Onsomu, 2014; Rostami and Dehaghani, 2015) who find significant effects of behavioral biases on investment decision in different stock exchanges around the world.

Table 3: The Chi-Square Test of Behavioral Biases for all Respondents.

	Familiarity Bias	Representativeness Bias	Availability Bias	Confirmation Bias	Disposition Bias	Overconfidence Bias	Loss Aversion	Herding Bias
Chi- Square	51.88[a]	51.88[a]	56.94[a]	62.23[a]	7.52[a]	56.94[a]	44.73[a]	14.23[a]
Asymp. Sig.	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00

Table 4: The t-Test of Behavioral Biases for all Respondents.

Biases	t	Sig. (2-tailed)	Mean Difference
Familiarity bias	10.820	.000	0.225
Representativeness bias	2.398	.018	0.074
Availability bias	3.012	.003	0.092
Confirmation bias	4.063	.000	0.125
Disposition bias	3.224	.002	0.081
overconfidence bias	3.871	.000	0.083
Loss aversion	9.370	.000	0.173
Herding bias	4.036	.000	0.120

In order to investigate whether gender matters in our topic, Tables 5 and 6 report the Chi-square test and t-test, respectively, of the differences between the male and female respondents' answers. Both tables show that there are no statistically significant differences between the answers of males and females. All the test values are insignificant. Thus, gender does not seem to matter when studying the effect of behavioral biases on investment decision. These results are consistent with (Bashir et al., 2013) and (Onsomu, 2014) who find no significant differences between males and females when considering the effect of behavioral biases on investment decision in Pakistan and Korea, respectively. However, they are contrasting with (Barber and Odean, 2001) who report that males are more overconfident than females in USA. Moreover, our results are contrasting with (Rekik and Boujelbene, 2013) who find significant differences between males and females when considering the effect of different behavioral biases on investment decision in the Tunisian stockexchange.

Table 5: The Chi-Square Test of Behavioral Biases For Male Versus Female Respondents.

Familiarity Bias	Value	Asymp. Sig. (2-Sided)
Pearson Chi-Square	.124[a]	.725
Continuity Correction[b]	.009	.923
Likelihood Ratio	.121	.727
Representitiveness Bias	**Value**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	.025[a]	.875
Continuity Correction[b]	0.000	1.000
Likelihood Ratio	.025	.875
Availability Bias	**Value**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	2.778[a]	.096
Continuity Correction[b]	1.972	.160
Likelihood Ratio	2.578	.108
Confirmation Bias	**Value**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	.129[a]	.719
Continuity Correction[b]	.008	.930
Likelihood Ratio	.127	.722
Disposition Bias	**Value**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	1.161[a]	.281
Continuity Correction[b]	.760	.383
Likelihood Ratio	1.187	.276
Overconfidence Bias	**Value**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	1.304[a]	.253
Continuity Correction[b]	.774	.379
Likelihood Ratio	1.234	.267
Loss Aversion Bias	**Value**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	.256[a]	.613
Continuity Correction[b]	.069	.793
Likelihood Ratio	.263	.608
Herding Bias	**Value**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	.604[a]	.437
Continuity Correction[b]	.320	.572
Likelihood Ratio	.595	.441

Table 6: The t-Test of Behavioral Biases For Male Versus Female Respondents.

Hypotheses		Levene's Test For Equality Of Variances		Test For Equality Of Means			
		F	Sig.	t	Sig. (2-Tailed)	Mean Difference	Std. Error Difference
Familiarity bias	Equal variances assumed	.091	.764	.499	.619	0.024	0.049
	Equal variances not assumed			.495	.623	0.024	0.049
Representativeness bias	Equal variances assumed	6.035	.015	1.078	.283	0.077	0.071
	Equal variances not assumed			1.163	.249	0.077	0.066
Availability bias	Equal variances assumed	3.014	.085	.579	.563	0.041	0.071
	Equal variances not assumed			.525	.602	0.041	0.079
- Confirmation bias	Equal variances assumed	1.813	.180	-.765	.445	-0.055	0.072
	Equal variances not assumed			-.725	.472	-0.055	0.076
Disposition bias	Equal variances assumed	.423	.517	-.567	.572	-0.033	0.059
	Equal variances not assumed			-.566	.574	-0.033	0.059
- overconfidence bias	Equal variances assumed	1.198	.276	1.393	.166	0.069	0.050
	Equal variances not assumed			1.459	.150	0.069	0.047
Loss aversion	Equal variances assumed	.142	.707	-1.122	.264	-0.048	0.043
	Equal variances not assumed			-1.132	.263	-0.048	0.043
Herding bias	Equal variances assumed	.094	.759	.266	.791	0.019	0.070
	Equal variances not assumed			.266	.791	0.019	0.070

CONCLUSIONS

This study examines eight different behavioral biases in Amman Stock Exchange and their effect on investment decision. The study also asks whether this effect differs between males and females. We use a questionnaire to answer the reassert questions. The results demonstrate a statistically significant effect of overconfidence bias, familiarity bias, loss aversion bias, disposition bias, availability bias, representativeness bias, confirmation bias and herding bias on investment decision. However, no statistically significant differences are found between males and females. These results are based on the answers of 236 investors in ASE.

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