

THE EFFECT OF AGE ON INVESTOR DECISIONS

By:

Zipporah N. Onsomu

University of Nairobi, Kenya.

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ABSTRACT

This research paper seeks to identify the effect of age on investor decisions at the Nairobi Securities Exchange, Kenya. A total of 57 investors responded. Data collected for this study was analyzed using descriptive statistics and Pearson Chi-square test. The results indicated that investors of all ages considered (18-30 years, 31-40 years, 41-50 years, above 50) were affected by the behavioral biases (overconfidence bias, Representativeness bias, Confirmation bias and Disposition effect). A significant relationship between age and overconfidence bias was exhibited. However, the relationship between age and Representativeness bias, Confirmation bias and Disposition effect was found to be insignificant at 5% significant level.

Keywords: *Behavioral Finance, Representativeness bias, Confirmation bias, Disposition effect and Overconfidence bias*

CHAPTER ONE: INTRODUCTION

Traditional finance models assume investor rationality in decision making. As such, the investors use the available information to make finance decisions which maximize utility. However, the models are based on assumptions which may not hold in practice. The assumption that all investors act rationally has been proved wrong because they exhibit irrational behaviors; they trade excessively, purchase stock without considering the fundamental value, base their decisions on past performance, buy stocks which their friends are buying, and retain loss making stocks while selling bullish stocks. Also, the supposition that all investors have the exact idea of potential returns has been disproved as the expectations of investors are normally biased. Over optimistic investors tend to expect excessive returns as compared to less optimistic returns.

Behavioral finance has explained irrationalities in the market place which Traditional Finance had failed to do. Behavioral biases which emanate from the field of Behavioral Finance have been found to affect investors differently based on their demographic characteristics. Rekik and Boujelbene (2013) found that demographic factors; gender, age, and experience had an impact on investment decisions among Tunisian investors. Also Obamuyi (2013) found that the socio-economic characteristics of investors (age, gender, marital status and educational qualifications) statistically and significantly influenced the investment decisions of investors in Nigeria.

Barber and Odean (2001) tested overconfidence bias between men and women and how it affects their performance. They found that men were affected more by the overconfidence bias and their returns were lower than those of women. Similar results were obtained by Lin (2011) who conducted a study on the relationship between psychological traits, demographics and financial behavioral biases for individual investors in Taiwan. The findings depicted that males were more overconfident than females and also older people were more overconfident than young people. Contrary results were obtained by Hon-Snir et al. (2012) where females were found to be more affected by the biases than males and the longer the investment experience, the lower the bias.

However, Bashir et al. (2013), Lee et al. (2013) and Chira et.al. (2008) in their investigation of the relationship between gender and overconfidence bias, found that gender was not related to overconfidence. In terms of herding effect, Rekik and Boujelbene (2013) found that Tunisian investors exhibited more of the herding effect and less of the mental accounting bias as compared to women.

In terms of age, contrary results have been obtained. Rekik and Boujelbene (2013) conducted a study on the Tunisian Stock market and found that older investors were less affected by behavioral biases due to more experience. However, Lin (2011) investigation of Taiwan investors found that older people depicted higher disposition effect and overconfidence than young people. A study by Bashir, Azam, Butt, Javed and Ayesha (2013c) results showed that age was negatively related with disposition effect and positively related with overconfidence, herding and risk-taking. The lack of consensus has necessitated this study to be carried out so as to provide a position on the relationship between age and overconfidence bias, Representativeness bias, Confirmation bias and disposition effect, and how this affects investor decisions.

CHAPTER TWO: LITERATURE REVIEW

2.1 Theoretical Review

This section discusses the Efficient Market Hypothesis which assumes investor rationality in decision making. However the behavior of investors in the market portrayed contrary behavior which was attributed to behavior biases among the investors. This led to the emergence of behavioral finance which is also discussed.

2.1.1 Efficient Market Hypothesis

Fama (1970) defines an efficient market as one in which the prices 'fully reflect' all the available information. EMH is built on the assumption that; Investors will act rationally, the existing irrational investors either will cancel their trade or follow the market and market participant must have a well defined utility functions which are expected to be maximized. He identified three forms of market efficiency; weak form, semi-strong and strong form of efficiency.

Weak-form efficiency is where prices of the securities reflect all information of the past price movements. This means that information in past prices will be reflected in today's stock price and not tomorrow's. There are no price patterns and price changes in one period will be independent of changes in the next period and the share prices follow a random walk.

In Semi-strong efficiency, asset prices fully reflect past prices and all publicly available information. In such a market the prices will adjust immediately to public information such that an investor cannot beat the market by analyzing the existing company-related or other relevant information available in the financial reports. Such publicly available information is already included in the current security prices. Lastly, Strong-form efficiency is where asset prices fully reflect all of the public and inside information available. Therefore, no one can have advantage on the market in predicting prices since there is no data that would provide any additional value to the investors.

EMH was supported by scholars such as Malkiel (1973) and Jensen (1978). Malkiel (1973) in the Random Walk Down Street supported the random walk theory which evidenced weak form efficiency. The random walk theory contends that stock prices take a random and unpredictable path. The chance of a stock's future price going up is the same as it going down such that, the past movement or direction of the price of a stock or overall market cannot be used to predict its future movement. Jensen (1978) contended that no other proposition which had more solid empirical evidence supporting it than the EMH.

However, Kemp and Reid (1971) depicted that share prices movements were 'conspicuously non-random'. This view was supported by Ball (1978) in a survey paper which revealed consistent excess returns after public announcements of firms' earnings. According to Grossman and Stiglitz (1980), it is impossible for a market to be perfectly informationally efficient because information is costly. As such, investors who spend resources in collecting data ought to be compensated. This can only be achieved if the prices do not perfectly reflect the information. Le Roy and Porter (1981) showed that stock markets exhibit excess volatility. This was concurred by Shiller (1981) who found that stock prices move too much to be justified by subsequent changes in dividends. Also Roll (1984) studied US orange juice futures prices and the effect of the weather and found excess volatility. Lastly De Bondt and Thaler (1985) discovered that stock prices overreact which evidenced weak form inefficiencies. This marked the start of behavioral finance.

2.1.2 BEHAVIORAL BIASES

Chira, Adams and Thornton (2008) define bias as a prejudice or a propensity to make decisions while already being influenced by an underlying belief. This has been associated with cognitive psychology which causes bounded rationality in finance decisions. Researchers have identified several biases which include disposition effect, availability bias, representativeness bias, hot hand fallacy, gambler's fallacy, confirmation bias, and overconfidence bias, anchoring and adjustment, framing, ambiguity effect and status quo.

Odean (1998) defines disposition effect as the tendency of investors to sell winning investments too soon and holding losing stocks for too long. Accordingly, investors will sell stock in order to realize the investment profits, but they may prefer the risks of continuing to own a stock that they would otherwise have sold if that stock is currently held for a loss. Availability bias is when investors assess the frequency of a class or the probability of an event by the ease with which instances or occurrences can be brought to mind (Tversky & Kahneman, 1974). This occurs when investors tend to overweigh current information while ignoring the fundamentals.

Representativeness bias is when investors consider a sample to fully represent the parent population (Kahneman & Tversky, 1974). As such, companies perceived to have for example competent managers or have reported high recent returns represent good investment opportunities. Representativeness bias produces two related biases; hot hand fallacy and gambler's fallacy. Confirmation bias is a tendency to interpret information in such a way that it confirms preconceptions, while avoiding interpretations which contradict previously held beliefs (Shefrin, 2007). This occurs when investors have already made their choices and search for information to confirm their preconceptions.

Overconfidence bias is when investors place too much weight on information they collect themselves due to excessive optimism (Daniel, Hirshleifer & Subrahmanyam, 1990). This causes investors to ignore information that lowers their self esteem and embraces that which allows them to maintain their confidence. Anchoring and adjustment is when people make estimates by starting from an initial value that is adjusted to yield the final answer or on the result of some incomplete information (Tversky & Kahneman, 1974). According to this heuristic, a person begins with a reference point (the "anchor") and makes adjustments with to it to reach their estimate.

Framing bias occurs when investors respond to information according to the manner in which it is presented (Tversky & Kahneman, 1981). They depicted that the frame that a decision-maker

adopts is controlled partly by the formulation of the problem and partly by the norms, habits, and personal characteristics of the decision-maker. Framing bias affects investors more in uncertain conditions.

Ambiguity effect is a cognitive bias where decision making is affected by a lack of information (Ellsberg, 1961). The effect implies that people tend to select options for which the probability of a favorable outcome is known over an option for which the probability of a favorable outcome is unknown. Also status quo as a bias is the likelihood of investors to find comfort in numbers and follow the actions of others. This causes people to prefer to maintain their current positions rather than move to new positions. Shapira and Venezia (2001) suggest that the status quo bias may explain why individual accounts are less diversified than professionally managed accounts.

2.2 EMPIRICAL REVIEW

Rekik & Boujelbene (2013) studied the determinants of individual investor behaviors among Tunisian investors. The sample consisted of 300 respondents for the period February 2011- May 2011. The findings revealed that Tunisian investors were affected by representativeness, herding attitude, loss aversion, mental accounting, and anchoring biases. In terms of age, older investors were found to be less affected by behavioral bias.

Zaidi and Tauni (2012) analyzed the relationship between investors' demographics, personality traits and overconfidence bias in the Lahore Stock Exchange. A sample of 200 investors was considered for the study. In terms of demographics, the study depicted that education level and age do not have a significant relationship with overconfidence bias while there was a positive association between overconfidence bias and investment experience.

Bashir, Azam, Butt, Javed and Ayesha (2013) conducted a study on the relationship of demographics and personality traits with investment biases and risk taking behavior among Pakistan investors. A sample of 225 investors from different cities was considered. The results

showed that age was negatively related with disposition effect and positively related with overconfidence, herding and risk-taking. This implied that as an investor became older, the disposition effect decreased while overconfidence, herding and risk taking increased. Marital status was found to have a negative relationship with investment biases. However, there was no significant relationship between demographic variables and investment biases and risk taking behavior.

Obamuyi (2013) conducted a study of the Nigeria Capital to determine the main factors influencing investment decisions of investors and how these factors are related to the investors' socio-economic characteristics. A sample of 297 respondents was considered. Independent t-test, Analysis of variance (ANOVA) and post hoc tests were employed. The results indicated that the most influencing factors on investment decisions of investors are past performance of the company's stock, expected stock split/capital increases/bonus, dividend policy, expected corporate earnings and get-rich-quick. The study also found that the socio-economic characteristics of investors (age, gender, marital status and educational qualifications) statistically and significantly influenced the investment decisions of investors in Nigeria.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

The study adopted a causal design so as to establish the effect of age on investor decisions.

3.2 Population and data collection

The population of the study was all individual investors of firms listed at the NSE. The target population was individual investors located at Mombasa County, Kenya. Random sampling technique was used in the study. Data was collected using questionnaires and 57 investors responded. The period of study was between January and March 2014.

3.2 Data analysis technique

Data collected for this study was analyzed by using descriptive statistics and Pearson Chi-square test was used to analyze the relationship between gender and the behavioral biases. To ascertain the difference between the answers given by the respondents on the basis of gender, age, education level, income level, the study will use the Chi Square test of independence. Cramer's V was used to measure the strength of the relationship. The value ranges from 0 to 1 and the nearer to 1 the stronger the relationship.

IV. DATA ANALYSIS / RESULTS

A total of 57 respondents were considered for the study. They were categorized into four age brackets; 18-30, 31-40, 41-50 and above 50 years. 31% Of the respondents were in the 18-30 age group, 54% were in the 31-40 age group, 10% were in the 41-50 age group and 5% in the last age group of above 50 years.

18 – 30 years

61% of the respondents in this age bracket had prior information of the company they had invested while 39% did not have any information. 41% had invested in one company while 59% had bought stocks in more than one company. Majority of the respondents had invested in the Telecommunication and Technology sector (61%), while Commercial and Services and the Banking sector had 33%. The other sectors had proportions of less than 30%

31-40 years

When they asked whether they had any information about the company which they invested in, 32% responded that they did not have any information while 68% had prior information of the company they invested in. The sources of information included media, brokers and dealers and family and friends

In terms of diversification, 26% had stock in one company while 74% had invested in more than one company. However, the investors did not consider all the companies listed at the Nairobi Securities Exchange. Majority of the respondents (65%) had invested in the Telecommunication segment, 45% in the Banking segment, 29% in the Energy sector, 19% in the Commercial sector while the other sectors had 6% and below.

41-50 years

83% of the respondents in this age bracket had prior information of the company they invested in, while 17% did not have any information. Also 83% had bought stocks in more than one company and 17% had invested in only one company. All the respondents had invested in the banking sector, 83% in the Telecommunication and Technology sector, and 33% had invested in the Commercial and Services, Energy and Manufacturing and Allied. Lastly, 17% of the respondents invested in the Insurance Company.

>50 years

33% of the respondents in this age bracket had information of the company they had invested in while 67% did not have prior information. 67% of the respondents had invested in more than one company and the other portion (33%) had invested in one company. All the respondents had invested in the Commercial and Services sector, 67% of the respondents had invested in the Agricultural and Banking segment. However, the response from this age bracket was insignificant to be considered for analysis.

4.1 Overconfidence Bias

56%, 11%, and 33% of the respondents in the age brackets 18-30 years, 31-40 years and 41-50 years respectively were affected by the overconfidence bias. The findings depict that age differences do significantly affect the level of overconfidence bias among the respondents. The responses were significantly different at 5% significance level as the P-value was 0.018 (*Table 1*). A significant relationship also exists between the respondents' age and overconfidence bias as depicted by the Cramer's V of 0.436 (*Table 2*).

Table 1: Age and Confidence bias

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.000 ^a	2	.018
Likelihood Ratio	8.540	2	.014
Linear-by-Linear Association	3.417	1	.065
N of Valid Cases	42		

Table 2: Cramer's V

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Phi	.436	.018
	Cramer's V	.436	.018
N of Valid Cases		42	

4.2 Representativeness Bias

The investors were asked whether they considered past information of the companies before they invested in them. 77%, 93%, and 83% of the age brackets 18-30, 31-40, 41-50 years respectively considered past performance information of the companies they invested. The χ^2 value = 2.118, and P-value = 0.347 (Table 3) depicted an insignificant relationship between age and representativeness bias. This was also supported by the Cramer's V which showed a weak relationship at a value of 0.212 (Table 4).

Table 3: Age and Representativeness bias

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.118 ^a	2	.347
Likelihood Ratio	2.038	2	.361
Linear-by-Linear Association	.599	1	.439
N of Valid Cases	47		

Table 4: Cramer's V

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Phi	.212	.347
	Cramer's V	.212	.347
N of Valid Cases		47	

4.3 Confirmation Bias

To test for confirmation bias, investors were asked whether they identify a company they want to invest in before searching for information or they seek for information first before selecting a company. Those who responded positively comprised of 64%, 72% and 33% of the age brackets 18-30, 31-40 and 41-50 years respectively. The results depicted an insignificant relationship between age differences and confirmation bias with $\chi^2 = 3.360$, and $P\text{-value} = 0.186$ (Table 5). The relationship is weak has shown by the Cramer's V value of 0.262 (Table 6).

Table 5: Age and Confirmation bias

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.360 ^a	2	.186
Likelihood Ratio	3.213	2	.201
Linear-by-Linear Association	.729	1	.393
N of Valid Cases	49		

Table 6: Cramer's V

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Phi	.262	.186
	Cramer's V	.262	.186
N of Valid Cases		49	

4.4 Disposition effect

To test for disposition effect, investors were asked what action they would take when the price of a stock they held increased. 61%, 71%, and 67% of the ages 18-30 years, 31-40 years, 41-50 years and above 50 years respectively chose to sell the stocks. However the age differences and disposition effect were found to be insignificantly related at 5% with a *P-value* = 0.639 (*Table 7*). The Cramer's V value of 0.133 (*Table 8*) depicted a very weak relationship between Disposition effect and age.

Table 7: Age and disposition Effect

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.897 ^a	2	.639
Likelihood Ratio	.900	2	.638
Linear-by-Linear Association	.878	1	.349
N of Valid Cases	51		

Table 8: Cramer's V

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.133	.639
	Cramer's V	.133	.639
N of Valid Cases		51	

5.0 CONCLUSION

The objective of the study was to determine whether behavioral biases affect individuals differently based on their age. A total of 57 respondents were considered for the study. The results depicted a significant relationship between age and overconfidence bias. Investors in the 18-30 years age bracket were the most affected while those in the 31-40 years were the least affected. This is in contrast With Rekik and Boujelbene (2013) who found that older investors were less affected as compared as compared to young investors and also Zaidi and Tauni (2012) who found an insignificant relationship between age and overconfidence bias.

Representativeness Bias was depicted in all the investors at 77%, 93% and 83% at age brackets 18-30 years, 31-40 years and 41-50 years respectively. However, the responses did not differ

significantly among the different age brackets. The P- *value* was 0.347 which had indicated an insignificant relationship between age and representativeness bias.

Investors of all the age brackets were affected by confirmation bias. The most affected investors were between 31-40 years at 72%, followed by 18-30 years at 64% and lastly 41-50 years at 33%. The results showed an insignificant relationship between age and confirmation bias.

Disposition effect affected all the investors at 61%, 71% and 67% for age brackets 18-30 years, 31-40 years and 41-50 years respectively. However, there was an insignificant relationship between age and disposition effect at 5%. This contradicts a similar study by Bashir, Azam, Butt, Javed and Ayesha (2013) who found that age was negatively related with disposition effect.

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