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BEHAVIORAL BIASES OF INDIVIDUAL INVESTORS: THE EFFECT OF ANCHORING†

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Abstract

The objective of this paper is to investigate the presence of the anchoring bias in the financial decision making of individual investors. A survey study is carried out to find out how the studied bias affects the investment behavior on the Tunisian stock market. The survey is for exploratory purpose and it is based on multiple factorial correspondence analyses. The results reveal that Tunisian investors do not suffer from the anchoring bias.

Keywords: Behavioral Finance, Anchoring, Individual Investors, Emergent Market
JEL Classification: G12

1. Introduction

The scandals that have occurred in recent years and the crashes and successive financial crises that characterize modern economies, including the current financial meltdown from the subprime, lead us to question the functioning of financial markets. Researchers try to understand the attitudes of investors, often influenced by mental routines, errors in judgments or even emotional factors. Obviously, this leads one to doubt the efficiency of financial markets, that is to say, their ability to control the policies of the firms and to allocate the capital optimally. Kahneman and Tversky (1974; 1979) propose an alternative study focusing on behavioral evidence in total opposition to the rationality of investors which follows the theory of financial markets. Indeed, investors are not fully rational and their demand for risky financial assets is affected by their beliefs or their feelings, which are clearly not justified by economic fundamentals. They are thus prey to several biases that affect their logical reasoning, and push them to commit errors in thinking.

Empirical work and recent experimental research have confirmed that the errors of judgments made by individuals affect the behavior of security prices on financial markets. In fact, investors do not necessarily follow objective notions of financial loss or gain calculated mathematically. A key way, in which investors are victims, is the anchoring bias according to which people tend to rely on the first piece of information offered (the "anchor") in making judgments or taking decisions.

In this paper, we seek to better understand the human behavior that governs the dynamics of financial markets, studied through investor anchoring on the Tunisian stock market. For that purpose, we use a questionnaire developed and administered to a Tunisian sample of individual investors. The rest of the paper is organized as follows: Section II presents a review

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of the literature of the anchoring bias, and Section III presents the assumptions of our work. Empirical validation is described in Section IV and Section V is devoted to present the empirical results and their interpretation. Finally, Section VI contains the summary and the conclusion.

2. Literature Review

Anchoring describes the common human tendency to rely too heavily, or 'anchor' on one trait or piece of information when making decisions. When presented with new information, the investors tend to be slow to change or the value scale is fixed or anchored by recent observations. They are expecting the trend of earning is to remain with historical trend, which may lead to possible under reactions to trend changes.

"In many situations, people make estimates by starting from an initial value that is adjusted to yield the final answer. The initial value, or starting point, may be suggested by the formulation of the problem, or it may be the result of a partial computation. In either case, adjustments are typically insufficient (Slovic and Lichtenstein, 1971). That is, different starting points yield different estimates, which are biased toward the initial values. We call this phenomenon anchoring (Tversky and Kahneman, 1974, p. 1128).

According to Esch *et al.* (2009), anchoring refers to a biased judgment of a stimulus based on an initial assessment of another stimulus and an insufficient adjustment away from that initial assessment". This means that an earlier presented value affects people when they are to estimate an unknown quantity, which then will be close to the value that was considered before the estimation. An example of the anchoring effect is how you get influenced by the asking price when buying a house (Kahneman, 2011). A higher asking price will influence you to value the house higher than you would have done if the asking price was lower. According to Kahneman (2011), any number that you are asked to consider as a possible solution to an estimation problem will induce an anchoring effect.

Numeric judgments under uncertainty are the most observed anchoring effects, since a lot of studies have been done in this field (Esch *et al.* 2009). However, the anchoring effect of a judgment does not have to be a numeric one (Cohen and Reed, 2006), but is a general phenomenon (Soman and Chattopadhyay, 2007). Hence, every time individuals form an image about a stimulus while another stimulus is present, this image may be subject to anchoring effects (Esch *et al.* 2009).

Anchoring is produced by two different mechanisms, where one occurs in System 1 and one in System 2. In System 1, anchoring is an automatic manifestation, which occurs by a priming effect. In System 2, anchoring instead occurs in a conscious activity of adjustment. However, there is in most cases no corresponding subjective experience in anchoring. This effect is therefore often perceived by people as unbelievable (Kahneman, 2011).

Forty years of psychological anchoring studies have found the anchoring bias to be fairly robust against experimental variations (Furnham and Boo, 2011). Contrasting this view, recent economic field experiments on anchoring in price valuations find only moderate effects (Simonson and Drolet, 2004; Bergman *et al.* 2010; Tufano, 2010; Alevy *et al.* 2011; Fudenberg *et al.* 2012; Maniadis *et al.* 2014). These results support the notion of market conditions correcting irrational consequences of individual heuristics. Therefore, rationality-increasing teamwork as a ubiquitous form of decision-making in actual markets might be an additional filter for biased decisions previously overlooked in experimental studies (Meub and Till, 2014).

3. Empirical Studies

3.1. Objective

The aim of our empirical studies is to test the existence of the anchoring bias on a sample of individual investors on the Tunisian stock market, to study if they are victims of this bias in making their decisions. For that, we conducted a questionnaire survey. Indeed, the psychology, which can be defined as "the science of behavior", must be taken into account by a method of investigation which can well describe the characteristics of the investor. The questionnaire

appears to be a useful tool in determining how individual errors affect aggregate behavior. We will particularly understand how the decisions of many individual investors are incorporated into prices on financial markets.

3.2. Data

The subjects are targeted on the individual private stock investors in Tunis[1]. We addressed our questionnaire to 150 Tunisian investors[2]. We used two methods of data collection (face to face interviews and mail survey). We got a response rate of 83% and a final sample of 125 investors. The survey was conducted in July 2008. The face-to-face interviews[3] allowed us to respond directly to questions that respondents were asked about the issue itself. It also allowed us to better control the representativeness of the sample. Furthermore, we avoided expressing any opinion or any form of approval or disapproval, to avoid influencing the respondent.

3.3. Profile of Respondents

Table 1 reports summary statistics for our sample of investors grouped by gender, age, education and business position. 73.6% of the subjects who responded to the questionnaire were men. This is easily understood since the number of men is higher than the number of women investing in the Tunisian stock market. A greater number of subjects (35.2%) were aged around 35~49 while 30.4% were aged between 25 and 34 years. 44% of the subjects have a bachelor degree while 44.8% have a master degree and above. We remark according to our sample, that the higher the degree of education, the more we invest in the stock market. Moreover, the proportion of executives is very high. In fact, they represent almost half of our sample (48%). Finally, most of the respondents belonged to the middle-income class with a monthly income between 600 and 2000 dinars[4].

Table 1. Profile of respondents

Variables	**Response (in %)**					
Gender	Male 73.6	Female 26.4	-	-	-	-
Age	<25 12.8	25-34 30.4	35-49 35.2	50-60 12.8	>60 8.8	
Education*	low 11.2	Middle 44.0	High 44.8	-	-	-
Income**	Low 23.3	Middle 58.4	High 18.4	-	-	-
Business position	Merchant, Artisan, Entrepreneur 6.4	Executive, Higher intellectual profession 48.0	Middle management 20.8	Employee 8.0	Student 9.6	Retired 7.2

Notes: *The education of low: high school or lower; middle: bachelor; high: master and above.
**The income of low: < 600 dinars; middle: [from 600 dinars to 2000 dinars]; high: > 2000 dinars.

[1] We note that commercial agents working at the front offices in stock market intermediary houses help as to contact the investors.
[2] Several questionnaires were omitted since too many questions had been left unanswered.
[3] Face to face interviews represent 70% of total interviews. We chose to perform our investigation on the big Tunis (Tunis, Ben Arous, Ariana), because the population of the big Tunis is heterogeneous and diversified and therefore, it gives us a greater depth of information.
[4] 100 Tunisian Dinars = 54.15 US Dollars as of 14/12/2014.

3.4. Methodology

For our study, we used the “Sphinx” software (trial version, V5). This allowed us to design the questionnaire, to register the responses, and especially to process and analyze the data. We did not take missing data into consideration. Indeed, the terms "no answers" do not appear in the results: It could be either a deliberate refusal to answer certain questions or accidental omissions.

The anchoring bias is studied through the following four questions. For each question, one response modality is considered symptomatic of the psychological bias. If we accumulate three typical responses, we confirm the presence of the latter. We create a code for each question (variable) and each modality. This involves defining a label, that is to say an abstract in a smaller number of characters. Each theme is associated with a number. For example, the first question is associated with the code "Loss value1”. The coding variable is given in Table 2.

Table 2. Coding variable

Loss value	When you lose money on a value you :	**Loss value1** : never reinvest on it **Loss value2** : Try to regain with it quickly **Loss value3** : look from time to time to see the evolution of its price without doing anything
Information after analysis	If the day after you bought a security you learn information that challenges your analysis, you :	**Information after analysis1** : abandon your analysis and, if appropriate, resell the security **Information after analysis2** : wait till another information comes consolidate one or the other of the positions **Information after analysis3** : put in perspective the scope of the information
First idea	You think in stock exchange the first idea:	**First idea1** : is always good **First idea2** : should never be followed **First idea3**: is often good when it comes to selling and bad when it comes to buying
Comparison	Over the long term, you prefer to buy a security that will be undervalued compared to:	**Comparison1** : its direct competitor **Comparison2**: its sector **Comparison3**: the overall market

Table 3 summarizes the anchoring symptoms that will be developed later.

Table 3. Anchoring symptoms

	Code
Presence of the representativeness bias	Loss value1
Under-reaction to new information	Information after analysis3
Importance of the first intuition	First idea1
Presence of the confirmation bias (numerical anchoring)	Comparison1

After this coding, the data were entered on the Sphinx software. Finally, we presented the results of the analysis.

4. Results

Tables 4, 5, 6 and 7 report the results of the univariate analysis of the various variables of the anchoring bias. The symptomatic modality of the bias is set in gray.

Table 4. Loss value

Loss value	Number of citations	%
Loss value1	14	11.5%
Loss value2	44	36.1%
Loss value3	64	52.5%
Total	122	100%

Table 5. Information after analysis

Information after analysis	Number of citations	%
Information after analysis1	31	25.0%
Information after analysis2	53	42.7%
Information after analysis3	40	32.3%
Total	124	100%

Table 6. First idea

First idea	Number of citations	%
First idea1	44	37.6%
First idea2	29	24.8%
First idea3	44	37.6%
Total	17	100%

Table 7. Comparison

Comparison	Number of citations	%
Comparison1	10	8.1%
Comparison2	46	37.1%
Comparison3	68	54.8%
Total	124	100%

We note from Table 4 that only 11.5% of the respondents prefer not to invest in a security that decreases substantially without any reason. In contrast, the majority of the subjects (52.5%) preferred to watch the evolution of its price from time to time without doing anything. This is not consistent with the representativeness bias that stipulates that past events are typical and representative of the future.

Table 5 shows that 42.7% of the respondents, when they learn information that calls into question their analysis, expect other information to come consolidating one or the other position. In contrast, 32.3% of the subjects put the scope of that information into perspective. This does not confirm the results of Bernard and Abarbanell (1992) and Barberis, Shleifer and Vishny (1998) that argue that the anchoring is at the origin of the under-reaction of investors to new information.

We note from Table 6 that 37.6% of the respondents consider that while trading the first idea is always good. The investor sentiment seems to be influenced by the first intuition (Bazerman, 2004; Chapman and Johnson, 2002; Epley, 2004). In Fact, They tend to overestimate the information that are in line with their first idea and to underestimate those that oppose it. Thus, they will more likely buy the security, when they had a favorable first impression and vice versa. In contrast, 37.6% of them assume that the first idea is often good when it comes to selling and bad when it comes to buying. Therefore, buying and selling decisions are not controlled by objective assessments, with the risks that entail (Mangot, 2004).

Table 7 shows that the majority of respondents (54.8%) prefer to buy undervalued securities as compared to the overall market over the long term. In contrast, only 8.1% of them consider the price of the competitor as an anchor. They present the numerical anchoring bias. It is a declination of numerical confirmation bias. It reflects the tendency to focus on a number and then use it as a reference when making an estimate (Mangot, 2004). This reasoning can be misleading. The less we know the market price, the more vulnerable it is to numerical anchor. Thus, the numbers (PER in this case) can affect the valuation of securities (Thomas and Morwitz, 2007). Therefore, we can get the values when the PER is lower (higher) than their comparable to buy in a bull market (bearish). Thus, valuations may deviate considerably from their historical standards. We conclude from the results of Tables 4, 5, 6 and 7 the absence of

the anchoring bias. Indeed, none of the symptomatic responses of the anchor bias is checked on the four variables studied[5].

5. Conclusion

Human decision making does not seem to conform to rationality and market efficiency, but exhibits certain behavioral biases that are clearly counter-productive from the financial perspective.

In this paper, we tested the presence of the anchoring bias on the Tunisian stock market. For that, we administered a questionnaire to a group of individual investors, to consider whether they are victims of this bias in their decision making. The results indicate that individual investors on the Tunisian stock exchange don't suffer from the anchoring bias. In fact, they are not subject to the representativeness and the confirmation biases. Moreover, they don't under-react to new information.

Besides, another interesting study could be made from the same research framework; it is to test the presence of other psychological biases such as herding, loss aversion and mental accounting. Further research should also investigate anchoring in the context of an experimental approach focusing on individual investment (Matsumoto *et al.* 2013). Also, further research could examine the relation between anchoring and overconfidence (Heywood-Smith *et al.* 2008).

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[5] We don't take into consideration the variable "first idea" because it shows the same percentage (37.6%) for two terms modalities.

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