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Review Article

THE EFFECT OF PERSONALITY TRAITS ON COGNITIVE INVESTMENT BIASES

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Abstract
The purpose of this research is to assess the impact of personality factors on an investor's financial decision-making particularly those related to cognitive biases. The understanding of behavioral biases among investors holds the key to identifying an investors' propensity to making irrational and illogical decisions. Our research examined an investors' behavioral orientation and their propensity towards cognitive biases in financial decision-making. Our research took place in two stages. In the first stage, we identified predominant cognitive biases among investors using an extensive review of existing research. We further prepared instruments to measure the cognitive biases for which we conducted exploratory factor analysis followed by confirmatory factor analysis. In the second stage, we used the 16pf instrument developed by Cattell to identify whether there exists a relationship between the personality of an investor and his propensity to have an inclination towards a particular cognitive behavioral bias and we identified some key relationships. Our research showed some interesting trends. We observed that most of the cognitive biases were related to particular personality traits namely, abstractedness, reasoning, emotional, stability, dominance and openness to change. Thus, for investment advisors and policy makers, if an investor demonstrates these personality traits, one can conclude that the investor may be more likely to have an inclination to have cognitive biases in investment decision making.

Keywords: Behavioral Finance, Cognitive biases, Cattell's 16 pf, investor decision making

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INTRODUCTION

Investor behavior is crucial in determining market movements (Cornelli, Goldreich and LJungqvist, 2006) especially since the basic tenets of traditional finance such as rationality have been proven incorrect (Yalçın, 2010). Traditional finance assumes that an investor will evaluate all possible outcomes of his decision by weighing the costs and benefits and derive the best risk benefit trade off (Markowitz, 1952). However, recent research has proved that is an unrealistic scenario (Schwarz, 1990; Forgas, 1995; Loewenstein et al., 2001) and markets demonstrate systematic errors in investor judgment.

Behavioral finance as a subject attempts to examine and explore the mechanism behind investor decision making by understanding psychology at the micro level along with the role of financial markets at the macro level (Shleifer, 2000). Further, investors may make judgments and decisions that are based on past event, personal beliefs and preferences (Choi, Laibson and Metrick, 2000) and establish short cuts or use heuristics (Kahneman, 2003) as a part of their decision making process. Lather et al, 2020 has identified a strong correlation on locus of control and behavioral biases in investment decision making. This therefore has become an extremely interesting research area to examine these systematic deviations in investor decision-making also called biases in financial decision-making (Chatterjee & Goetz, 2015).

Baker and Nofsinger (2002) examined and further studied behavioral biases and identified two types of biases, namely emotional and cognitive biases. Lucey and Dowling, 2005 examined emotional behavioral biases and identified that emotional biases are the result of reasoning which is influenced by feelings/ emotions and is based on the intuition of an investor. In contrast, Tversky and Kahneman, 1973, observed that cognitive biases are based on errors in basic statistical processing, information processing or memory processing. However, one key difference between cognitive and emotional behavioral bias is that cognitive biases can be corrected (Anderson, 2002) since they stem from faulty reasoning rather that emotional predisposition (Ricciardi, 2008).

Our present study aims to examine the impact of personality traits on behavioral biases and preferences to identify patterns in investor decision making. For this research, we have focused on a subset of behavioral biases, which comprise of cognitive behavioral biases.

LITERATURE REVIEW

Cognitive behavioral Biases

Cognitive behavioral biases are further classified as belief perseverance biases such as representativeness, illusion of control, confirmation and conservatism bias in which investors tend to classify new information based on past experiences and classifications (Pompian, 2012) and the information processing biases such as anchoring and adjustment, mental accounting, framing, and availability caused to errors in information processing. An extensive literature review was conducted to identify predominant cognitive biases.Based on the existing literature review, our research the below predominant cognitive behavioral biases existent in investor decision, which are summarized below: -

1. Mental Accounting Bias – Thaler, 1990 identified mental according as the tendency for investors to separate their accounts and classify them based on subjective criteria causing them to set points of reference for their gains and losses, which causes them to "put things in boxes" and track them individually.
2. Illusion of Control Bias – Investors prone to the Illusion of control bias tend to believe that they can control or influence outcomes of events and choices when they in facto cannot. This often causes investors to inflate confidence and generate illusions leading to inadequately diversified portfolios (Fellner, 2009)
3. Representativeness Bias – Representativeness Bias is a belief perseverance bias wherein investors tend to classify new information based on their experiences. Investors tend to rely on a best-fit approximation based on their existing frame of reference leading to biased decision making (Kahneman & Tversky, 1974)
4. Availability Bias – Investors prone to the availability bias tend to overestimate the probabilities associated with

events causing them to give excessive weightage on the information available leading them to err in financial decision-making (Odean, Barber 2002)

5. Anchoring and Adjustment Bias – Investors prone to anchoring and adjustment bias tend to start from incorrect reference points and end up making incorrect offsets causing them to err in their decision making. (Slovic & Lichtenstein, 1971)
6. Ambiguity Aversion- Investors prone to ambiguity aversion tend to place higher values on bets with known probabilities (risk) than bets with unknown probabilities (uncertainty) (Ellsberg, 1961).
7. Self-Attribution- Investors prone to self-attribution bias tend to relate their successes to their foresight or talents and often blame others for their failures(Dunn, 1989, Odean, barber, 2001)
8. Overconfidence bias – Overconfidence bias can be defined as an unwarranted faith in ones reasoning, judgments and abilities leading to systematic errors in decision-making. This bias is further classified into prediction overconfidence, wherein investors assign incorrect probabilities to their predictions and certainly overconfidence, when they are too certain of their judgements leading to errors in financial decision making (Statman, 1999)
9. Cognitive Dissonance – Investors prone to the cognitive dissonance bias tend to experience mental discomfort when acquiring new information in decision-making. The often leads to investors holding their losing positions too long (Razek, 2011)
10. Confirmation Bias – Investors prone to the confirmation bias tend to misinterpret new information to support their prior beliefs (Rabin and Schrag, 1999)

These biases sit deep within our psyche and as fundamental parts of human nature. For our present, study, we studied the relationship of these cognitive behavioral biases with personality traits.

Cattell's Sixteen Personality Factors

The sixteen-personality factors questionnaire is a psychometric self-report personality questionnaire developed by Cattell, 1956 and has been used thoroughly tested and highly utilized by clinicians and translated in several languages (Mead & Cattell, 2008). It has been widely used by psychologists for diagnosing mental disorders as well as planning for therapies for individuals. The underlying basis for the 16pf questionnaire are the innate differences in cognitive abilities, the transitory emotional states, the normal and abnormal personality traits, and the dynamic motivational traits

Cattell mentions that at the basis of 16PF stand the individual differences in cognitive abilities, the transitory emotional states, the normal and abnormal personality traits, and the dynamic motivational traits. Because of this, the 16PF questionnaire asks routine, concrete questions instead of asking the respondents to self-assess their personality, therefore removing the subjectivity and self-awareness of the subject. Filling in the 16PF questionnaire usually takes between 25 and 50 min and is designed for adults at least 16 years of age(Boyle et al ,2012). The 16PF traits evaluated using this questionnaire are the following:

- Warmth (A), reserved/warm
- Reasoning (B), concrete thinking/abstract thinking
- Emotional stability (C), reactive/emotionally stable
- Dominance (E), submissive/dominant
- Liveliness (F), serious/lively
- Rule consciousness (G), expedient/rule conscious
- Social boldness (H), shy/bold
- Sensitivity (I), unsentimental/sensitive
- Vigilance (L), trusting/vigilant
- Abstractedness (M), practical/abstracted
- Privateness (N), forthright/shrewd
- Apprehension (O), self-assured/apprehensive
- Openness to change (Q1), traditional (conservative)/ open-to-change
- Self-reliance (Q2), group-dependent/self-reliant
- Perfectionism (Q3), tolerates disorder/perfectionistic
- Tension (Q4), relaxed/tense

All these traits are evaluated using a score from 1 to 10 (e.g., for trait warmth, 1 means "reserved," 10 means "warm," and any score in between is a nuance within the two extreme values).

RESEARCH METHODOLOGY

Review Of Existing Research

In the first part of the research, we reviewed the existing literature in the area of behavioral finance to identify various biases in investor decision making. We further segregated cognitive behavioral biases, which is our area of interest. For each of these biases, an extensive literature review was conducted and constructs defined followed by questionnaire design on a likert scale from one to five. A consolidated instrument with all biases was prepared and exploratory factor analysis was applied followed by confirmatory factor analysis. The initial questionnaire was prepared with 97 questions under the pilot study based on the recommendation from Bryman and Bell, 2007 which reduced to 50 questions after confirmatory factor analysis.

Final Questionnaire

The final questionnaire comprised of 50 questions to measure eleven behavioral biases, 170 questions of Cattell's sixteen personality factors and some demographic questions such as gender, region of the country, age group, income level, level of education, financial literacy and years of trading experience making 230 questions, which was administered on 750 investors. 618 complete responses were received and analyzed for this study.

Research Design

This study followed an empirical research design to establish a relationship between Cattell's sixteen personality factors and cognitive behavioral biases. For the study a 4 X 4 X 2 X 3 X 4 Factorial design was used. The regional differences amongst individual investors, namely north, south, east and west, along with age, educational background with special emphasis on a financial background was considered. Under each unit, the years in trading from 0-1, 1-3, 3- 5 and above 5 years of experience were used for the study.

Sample Size

Based on a 4 X 4 X 2 X 3 X 4 factorial design, a minimum of 480 individual investors sample size was required. For the present study our sample size is 618 investors.

RESULTS AND FINDINGS

The results were analyzed based on each of the behavioral biases and some interesting trends were observed. Table 1 below shows that 69.7 percent of the deviations in mental accounting could be explained by personality traits such as abstractedness, reasoning, emotional stability, dominance, rule consciousness and open to change. Therefore, an investor scoring high in abstractedness, typically investors who are imaginative, self-motivated often absorbed in their own thoughts would demonstrate a higher inclination towards the mental according bias. Similarly, investors with high scores on reasoning, who are typically bright, abstract thinking and more intelligent having a quick grasp on ideas, would also show a high propensity to demonstrate the mental accounting bias. Further, investors, who scored low on emotional stability i.e investors who get easily annoyed, are affected by feelings and emotionally less stable demonstrated a higher propensity towards the mental accounting bias. In addition, investors scoring high on dominance, typically those that can be described as expressive, heedless, expressive, cheerful, enthusiastic and cheerful would demonstrate a higher inclination towards the mental accounting bias.

The table 1 below depicts the analysis of the illusion of control bias wherein 68.9% of the deviation can be explained by personality traits like reasoning, abstractedness, dominance, emotional stability, sensitivity and rule consciousness. Investors scoring high on reasoning who are more intelligent, bright having a quick grasp on idea and a fast learner tend to have a higher inclination towards the illusion of control bias. Similarly, individuals having a high score on abstractedness, who can be described as self-motivated, imaginative and absorbed in their own thoughts to demonstrate a higher inclination towards the illusion of control bias. In addition, investors with high scores on dominance, who are described as dominant, aggressive, bossy and competitive, tend to have a stronger inclination to demonstrate the illusion of control bias. Further, investors with low scores on emotional stability, typically those who can be described as emotionally less table, easily annoyed and affected by feelings to demonstrate a higher propensity towards the illusion of control bias.

Table:1

	F(Sig)	R	R Square	Adj R Sq	Std. Err Est	Unstandardized Coefficients		Std Coeff Beta	t	Sig.
						B	Std Err			
Mental accounting										
M-Abstractedness	234.692 (.000)	.835[f]	.697	.694	.67398	.157	.021	.313	7.586	.000
B-Reasoning						.108	.017	.266	6.269	.000
C-Emotional Stability						-.077	.018	-.160	-4.307	.000
E-Dominance						.064	.018	.120	3.545	.000
G-Rule Consciousness						-.056	.024	-.056	-2.335	.020
Q1-Open to Change						.030	.015	.057	2.005	.045
Illusion of Control										
	225.123 (.000)	.830[f]	.689	.685	.62638					
B-Reasoning						.103	.016	.276	6.363	.000
M-Abstractedness						.123	.020	.268	6.266	.000
E-Dominance						.075	.017	.155	4.535	.000
C-Emotional Stability						-.060	.017	-.135	-3.566	.000
I-Sensitivity						.054	.024	.077	2.274	.023
G-Rule Consciousness						-.047	.022	-.051	-2.092	.037
Representativeness										
M-Abstractedness	272.610 (.000)	.870[g]	.758	.755	.60134	.160	.019	.319	8.597	.000
B-Reasoning						.111	.016	.275	6.962	.000
E-Dominance						.060	.016	.114	3.736	.000
C-Emotional Stability						-.060	.016	-.126	-3.765	.000
Q1-Open to Change						.035	.013	.068	2.659	.008

G-Rule Consciousness						-.054	.022	-.055	-2.527	.012
Q4-Tension						.042	.017	.069	2.495	.013
Availability										
B-Reasoning	234.207 (.000)	.835[f]	.697	.694	.73246	.128	.019	.289	6.662	.000
M-Abstractedness						.135	.023	.247	5.865	.000
E-Dominance						.073	.020	.126	3.716	.000
C-Emotional Stability						-.065	.020	-.124	-3.314	.001
Q1-Open to Change						.047	.016	.085	2.947	.003
I-Sensitivity						.075	.028	.090	2.689	.007
Anchoring & Adjustment										
B-Reasoning	367.598	.910[h]	.828	.826	.55386	.129	.015	.291	8.625	.000
M-Abstractedness						.140	.017	.255	8.049	.000
E-Dominance						.088	.015	.151	5.803	.000
C-Emotional Stability						-.073	.015	-.138	-4.911	.000
Q4-Tension						.073	.015	.109	4.694	.000
Q1-Open to Change						.033	.012	.058	2.697	.007
O-Apprehension						.048	.021	.052	2.279	.023
EXTRAVERSION						.075	.037	.035	2.034	.042
Ambiguity										
B-Reasoning	259.472	.865[g]	.749	.746	.65754	.130	.018	.299	7.442	.000
M-Abstractedness						.165	.020	.308	8.128	.000
C-Emotional Stability						-.060	.018	-.116	-3.402	.001
E-Dominance						.057	.018	.099	3.199	.001
Q1-Open to Change						.047	.014	.085	3.259	.001
G-Rule Consciousness						-.053	.024	-.050	-2.259	.024
Q4-Tension						.039	.018	.060	2.137	.033
Self-Attribution										
M-Abstractedness	176.944	.836[h]	.699	.695	.63601	.152	.019	.321	7.918	.000
B-Reasoning						.102	.017	.265	6.074	.000
E-Dominance						.069	.017	.137	4.022	.000

G-Rule Consciousness						-.057	.023	-.061	-2.534	.012
Q1-Open to Change						.029	.014	.059	2.089	.037
O-Apprehension						.058	.024	.073	2.406	.016
ANXIETY						.094	.042	.051	2.223	.027
Q4-Tension						.038	.018	.067	2.163	.031
Prediction Overconfidence										
B-Reasoning	254.125	.863 g	.745	.742	.62858	.113	.017	.274	6.772	.000
M-Abstractedness						.141	.020	.276	7.198	.000
C-Emotional Stability						-.077	.017	-.157	-4.620	.000
Q4-Tension						.059	.018	.095	3.343	.001
Q1-Open to Change						.046	.014	.089	3.367	.001
E-Dominance						.051	.017	.095	3.028	.003
EXTRAVERSION						.114	.042	.057	2.725	.007
Certainty Overconfidence										
M-Abstractedness	238.812	.871 h	.758	.755	.63762	.165	.020	.310	8.235	.000
B-Reasoning						.097	.017	.226	5.664	.000
E-Dominance						.074	.017	.131	4.231	.000
C-Emotional Stability						-.066	.017	-.129	-3.863	.000
Q1-Open to Change						.040	.014	.074	2.889	.004
Q4-Tension						.047	.018	.073	2.649	.008
O-Apprehension						.058	.024	.065	2.371	.018
EXTRAVERSION						.084	.043	.040	1.973	.049
Cognitive Dissonance										
B-Reasoning	254.863	.863 g	.745	.742	.65211	-.117	.017	-.273	-6.751	.000
M-Abstractedness						-.157	.020	-.297	-7.791	.000
E-Dominance						-.071	.018	-.127	-4.074	.000
C-Emotional Stability						.063	.017	.123	3.600	.000
G-Rule Consciousness						.066	.023	.063	2.827	.005
Q1-Open to Change						-.039	.014	-.071	-2.716	.007
Q4-Tension						-.045	.018	-.070	-2.460	.014

Confirmation										
B-Reasoning	280.245	.873 g	.763	.760	.60151	.125	.016	.304	7.791	.000
M-Abstractedness						.133	.019	.263	7.145	.000
C-Emotional Stability						-.091	.016	-.186	-5.652	.000
G-Rule Consciousness						-.079	.022	-.079	-3.683	.000
E-Dominance						.043	.016	.081	2.674	.008
Q4-Tension						.043	.017	.070	2.553	.011
Q1-Open to Change						.028	.013	.054	2.126	.034

Further, investors with high scores on sensitivity, typically those who can be described as intuitive, refined, temperamental and emotionally sensitive to demonstrate higher inclination to demonstrate illusion of control. In addition, individuals with low scores on rule consciousness, namely those who can be described as self-indulgent, expedient and disregards rules to have a higher propensity to demonstrate the illusion the control bias.

The table above further depicts the analysis of the representativeness bias wherein 75.8% of the deviation can be explained by personality traits like reasoning, abstractedness, dominance, emotional stability, tension, openness to change and rule consciousness. Investors scoring high on reasoning who are more intelligent, bright having a quick grasp on idea and a fast learner tend to have a higher inclination towards the representativeness bias. Similarly, individuals having a high score on abstractedness, who can be described as self-motivated, imaginative and absorbed in their own thoughts to demonstrate a higher inclination towards the representativeness bias. In addition, investors with high scores on dominance, who are described as dominant, aggressive, bossy and competitive, tend to have a stronger inclination to demonstrate the representativeness bias. Further, investors with low scores on emotional stability, typically those who can be described as emotionally less table, easily annoyed and affected by feelings to demonstrate a higher propensity towards the representativeness bias. Also, individuals with high scores on openness to change, typically those who are critical, liberal and experimenting tend to demonstrate higher inclination to demonstrate the representativeness bias. In addition, individuals with low scores on rule consciousness, namely those who can be described as self-indulgent, expedient and disregards rules to have a higher propensity to demonstrate the representativeness bias. Further, individuals, who score higher on tension and were tense and frustrated, were more likely to demonstrate the representativeness The table below depicts the analysis of the availability bias wherein 69.7% of the deviation can be explained by personality traits like reasoning, abstractedness, dominance, emotional stability, openness to change and sensitivity. Investors scoring high on reasoning who are more intelligent, bright having a quick grasp on idea and a fast learner tend to have a higher inclination towards the availability bias. Similarly, individuals having a high score on abstractedness, who can be described as self-motivated, imaginative and absorbed in their own thoughts to demonstrate a higher inclination towards the availability bias. In addition, investors with high scores on dominance, who are described as dominant, aggressive, bossy and competitive, tend to have a stronger inclination to demonstrate the availability bias. Further, investors with low scores on emotional stability, typically those who can be described as emotionally less table, easily annoyed and affected by feelings to demonstrate a higher propensity towards the availability bias. Also, individuals with high scores on openness to change, typically those who are critical, liberal and experimenting tend to demonstrate higher inclination to demonstrate the availability bias. In addition, individuals with high scores on sensitivity, typically those described as sensitive, overprotected and refined to be more likely to demonstrate the availability bias.

The table below depicts the analysis of the anchoring and adjustment bias wherein 82.8% of the deviation can be explained by personality traits like reasoning, abstractedness, dominance, emotional stability, tension, openness to change, apprehension and extraversion. Investors scoring high on reasoning who are more intelligent, bright having a quick grasp on idea and a fast learner tend to have a higher inclination towards the anchoring and adjustment bias. Similarly, individuals having a high score on abstractedness, who can be described as self-motivated, imaginative and absorbed in their own thoughts to demonstrate a higher inclination towards the anchoring and adjustment bias. In addition, investors with high scores on dominance, who are described as dominant, aggressive, bossy and competitive, tend to have a stronger inclination to demonstrate the anchoring and adjustment bias. Further, investors with low scores on emotional stability, typically those who can be described as emotionally less table, easily annoyed and affected by feelings to demonstrate a higher propensity towards the anchoring and adjustment bias. In addition, investors with high scores on tension who are typically, tense, frustrated, overwrought having a high drive, tend to be more likely to demonstrate the anchoring and adjustment bias. Also, individuals with high scores on openness to change, typically those who are critical, liberal and experimenting tend to demonstrate higher inclination to demonstrate the anchoring and adjustment bias. Further, investors with high scores on apprehension, who are described as insecure, guilt prone, self-blaming are more likely to have the anchoring and adjustment bias. Also, investors with high scores on the extraversion are more likely to demonstrate the anchoring and adjustment bias.

The table below depicts the analysis of the Ambiguity bias wherein 74.9% of the deviation can be explained by personality traits like reasoning, abstractedness, emotional stability, dominance, openness to change, rule consciousness and tension. Investors scoring high on reasoning who are more intelligent, bright having a quick grasp on idea and a fast learner tend to have a higher inclination towards the Ambiguity bias. Similarly, individuals having a high score on abstractedness, who can be described as self-motivated, imaginative and absorbed in their own thoughts to demonstrate a higher inclination towards the Ambiguity bias. In addition, investors with high scores on dominance, who are described as dominant, aggressive, bossy and competitive, tend to have a stronger inclination to demonstrate the Ambiguity bias. Further,

investors with low scores on emotional stability, typically those who can be described as emotionally less table, easily annoyed and affected by feelings to demonstrate a higher propensity towards Ambiguity bias. In addition, investors with high scores on tension who are typically, tense, frustrated, overwrought having a high drive, tend to be more likely to demonstrate the Ambiguity bias. Also, individuals with high scores on openness to change, typically those who are critical, liberal and experimenting tend to demonstrate higher inclination to demonstrate the Ambiguity bias. Further, investors with low scores on rule consciousness who are self indulgent, disregards rules and are expedient tend to be more likely to demonstrate the Ambiguity bias.

The table below depicts the analysis of the Self Attribution bias wherein 69.9% of the deviation can be explained by personality traits like reasoning, abstractedness, dominance, rule consciousness, openness to change, apprehension, anxiety and tension. Investors scoring high on reasoning who are more intelligent, bright having a quick grasp on idea and a fast learner tend to have a higher inclination towards the Self Attribution bias. Similarly, individuals having a high score on abstractedness, who can be described as self-motivated, imaginative and absorbed in their own thoughts to demonstrate a higher inclination towards the Self Attribution bias. In addition, investors with high scores on dominance, who are described as dominant, aggressive, bossy and competitive, tend to have a stronger inclination to demonstrate the Self Attribution bias. Further, individuals with low scores on rule consciousness, who are self-indulgent and disregards rules are more likely to have the Self Attribution bias. Also, individuals with high scores on openness to change, typically those who are critical, liberal and experimenting tend to demonstrate higher inclination to demonstrate the Self Attribution bias. Further, investors with high scores on apprehension, who are imaginative, absent minded and absorbed in thought are more likely to demonstrate the self-attribution bias. Also, investors with high scores on anxiety tend to be more likely to demonstrate the self-attribution bias. In addition, investors with high scores on tension who are typically, tense, frustrated, overwrought having a high drive, tend to be more likely to demonstrate the self-attribution bias.

The table below depicts the analysis of the prediction overconfidence bias wherein 69.9% of the deviation can be explained by personality traits like reasoning, abstractedness, emotional stability, tension, openness to change, dominance and extraversion. Investors scoring high on reasoning who are more intelligent, bright having a quick grasp on ideas and a fast learner tend to have a higher inclination towards the prediction overconfidence bias. Similarly, individuals having a high score on abstractedness, who can be described as self-motivated, imaginative and absorbed in their own thoughts to demonstrate a higher inclination towards the prediction overconfidence bias. Further, investors with low scores on emotional stability, typically those who can be described as emotionally less table, easily annoyed and affected by feelings to demonstrate a higher propensity towards prediction overconfidence bias. In addition, investors with high scores on tension who are typically, tense, frustrated, overwrought having a high drive, tend to be more likely to demonstrate the prediction overconfidence bias. Also, individuals with high scores on openness to change, typically those who are critical, liberal and experimenting tend to demonstrate higher inclination to demonstrate the prediction overconfidence bias. . In addition, investors with high scores on dominance, who are described as dominant, aggressive, bossy and competitive, tend to have a stronger inclination to demonstrate the prediction overconfidence bias. In addition, investors who have high scores on extraversion are more likely to demonstrate prediction overconfidence bias.

The table below depicts the analysis of the certainty overconfidence bias wherein 75.8% of the deviation can be explained by personality traits like abstractedness, reasoning, dominance, emotional stability, openness to change, tension, apprehension and extraversion. Investors having a high score on abstractedness, who can be described as self-motivated, imaginative and absorbed in their own thoughts to demonstrate a higher inclination towards the certainty overconfidence bias. Similarly, Investors scoring high on reasoning who are more intelligent, bright having a quick grasp on ideas and a fast learner tend to have a higher inclination towards the certainty overconfidence bias. In addition, investors with high scores on dominance, who are described as dominant, aggressive, bossy and competitive, tend to have a stronger inclination to demonstrate the certainty overconfidence bias. Further, investors with low scores on emotional stability, typically those who can be described as emotionally less table, easily annoyed and affected by feelings to demonstrate a higher propensity towards certainty overconfidence bias. Also, individuals with high scores on openness to change, typically those who are critical, liberal and experimenting tend to demonstrate higher inclination to demonstrate the certainty overconfidence bias. In addition, investors with high scores on tension who are typically, tense, frustrated, overwrought having a high drive, tend to be more likely to demonstrate the certainty overconfidence bias. Also, investors with high scores on apprehension who are self-blaming, insecure and worrying may be more likely to demonstrate certainty overconfidence bias. Further, individuals with high scores on extraversion may also demonstrate certainty overconfidence bias.

The table below depicts the analysis of the cognitive dissonance bias wherein 74.5% of the deviation can be explained by personality traits like reasoning, abstractedness, dominance, emotional stability, rule consciousness, openness to change and tension. Investors with low scores on reasoning, who are less intelligence, slow to learn and grasp things are more likely to have cognitive dissonance bias. Further, investors scoring low on abstractedness, who are practical, steady and down to earth, are more likely to have the cognitive dissonance bias. Also, investors with low scores on dominance who tend to be docile, mild and humble are more likely to demonstrate the cognitive dissonance bias. Further, investors who scored high on emotional stability, i.e who are mature, calm and emotionally stable are more likely to have the cognitive dissonance bias. Further, investors with high scores on rule consciousness i.e are rule bound, confirming and conscientious, are more likely to have the congnitive dissonance bias. Also, investors with low openness to change ad low tension, i.e conservative, respecting traditions, relaxed and composed are more likely to have the cognitive dissonance bias.

The table below depicts the analysis of the confirmation bias wherein 76.3% of the deviation can be explained by personality traits like reasoning, abstractedness, emotional stability, rule consciousness, dominance, tension and openness to change. , Investors scoring high on reasoning who are more intelligent, bright having a quick grasp on ideas and a fast learner tend to have a higher inclination towards the confirmation bias. Similarly, Investors having a high score on abstractedness, who can be described as self-motivated, imaginative and absorbed in their own thoughts to demonstrate a higher inclination towards the confirmation bias. Further, investors with low scores on emotional stability, typically those who can be described as emotionally less table, easily annoyed and affected by feelings to demonstrate a higher propensity towards confirmation bias. Further, individuals with low scores on rule consciousness, who are self-indulgent and disregards rules, are more likely to have the confirmation bias. In addition, investors with high scores on dominance, who are described as dominant, aggressive, bossy and competitive, tend to have a stronger inclination to demonstrate the confirmation bias. In addition, investors with high scores on tension who are typically, tense, frustrated, overwrought having a high drive, tend to be more likely to demonstrate the confirmation bias. Also, individuals with high scores on openness to change, typically those who are critical, liberal and experimenting tend to demonstrate higher inclination to demonstrate the confirmation bias.

A scrutiny of the biases and the personality traits affecting the biases is shown in the table below.

Table:2

Bias	Abstractedness	Reasoning	Emotional Stability	Dominance	Rule consciousness	Openess to change	Sensitivity	Tension	Apprehension	Extraversion	Anxiety
Mental Acconting	Positive	Positive	Negative	Positive	Negative	Positive					
Illusion of Control	Positive	Positive	Negative	Positive	Negative		Positive				
Representativeness	Positive	Positive	Negative	Positive	Negative	Positive		Positive			
Availability	Positive	Positive	Negative	Positive		Positive	Positive				
Anchoring and Adjustment	Positive	Positive	Negative	Positive		Positive		Positive	Positive	Positive	
Ambiguity	Positive	Positive	Negative	Positive	Negative	Positive		Positive			
Self-attribution	Positive	Positive	Negative	Positive	Negative	Positive		Positive	Positive		Positive
Prediction overconfidence	Positive	Positive	Negative	Positive		Positive		Positive		Positive	
Certainty overconfidence	Positive	Positive	Negative	Positive		Positive	Positive	Positive	Positive	Positive	Positive
Cognitive Dissonance	Negative	Negative	Positive	Negative	Positive	Negative		Negative			
Confirmation	Positive	Positive	Negative	Positive	Negative	Positive					

The table above shows some interesting trends between personality traits and cognitive behavioral biases. There appear to be correlations between personality factors and cognitive behavioral biases. Further, it appears personality characteristics such as abstractedness, reasoning, emotional, stability, dominance and openness to change are few predominant characteristics of investors demonstrating cognitive behavioral biases. This allows us to draw some interesting conclusions, especially since the presence of these personality characteristics shows that an investor may be highly likely to be prone to cognitive behavioral biases.

LIMITATION OF THE RESEARCH

The present research had some shortcomings since it is only examining a subset of behavioral biases namely cognitive biases and only one aspect of personality, which was measured using sixteen personality factors, was used. We can further examine the decision making process of the investor with other behavioral tools. Further, our present research has only focused on investors in India. This is also a research gap since we can further extend this research to other countries and their investors to identify and compare the impact of personality on investment related behavior.

CONCLUSIONS

Our research illustrates that there are some predominant personality factors that lead to a strong inclinations of an investor to be impacted by cognitive behavioral biases. This implies that by measuring only a subset of an investors personality trails, one can determine his/her inclination towards particular cognitive biases. With this knowledge, an investor can take corrective steps in his financial decision-making and safeguard against irrational decisions due to these biases. Further, investment advisors and financial planners can use this knowledge to better understand the portfolio of their clients and their clients' propensity towards particular behavioral biases. With this knowledge, we hope that an investor can protect oneself from possible losses due to irrationality introduced due to these cognitive biases.

Thus, our research hopes to arm investors, investment advisors, financial planners and policy makers with a better view of their deviation from rational decision making with a view to safeguard investors from systematic errors in investment decision making.

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