Behavioural Biases Scale for Retail Investors' Trading Behaviour

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ABSTRACT

The purpose of this paper was to describe the development of a survey instrument designed to directly measure the effects of the underlying psychological constructs on the behaviour of retail-investors engaging in stock trading at the Dar es Salaam stock exchange. The paper adopts a survey research approach to outline the process of developing, validating and testing as survey instrument to help researchers better understand how retail investors make decisions when trading stocks. This study is guided by six behavioural theories, namely availability bias, representativeness bias, overconfidence bias, ambiguity aversion, regret aversion, and loss aversion. Empirical data for these variables were collected through a questionnaire administered to a sample of 280 respondents. Convenience and snowball sampling techniques were employed to recruit participants. To ensure reliability, the study employed the Cronbach's alpha (α) coefficient, while Principal Component Analysis (PCA) was performed to assess the construct validity of various behavioural biases. The results indicate that the final survey instrument comprises 49 items developed from eight behavioural constructs, organised into seventeen scales, all of which demonstrate acceptable levels of content validity, reliability and construct validity. The paper concludes that the developed instrument is valuable for both academic and practitioner communities, particularly interested in studying trading behaviour of retail stock investors. The primary contribution of this study is the development of a reliable instrument for measuring retail investor trading behaviour in frontier markets. Therefore, the study recommends that researchers, professionals, policy makers and other stakeholders to utilise these constructs in future investigations of investors trading behaviour and into educational programmes to mitigate the negative impacts of biases on decision-making.

Keywords: Behavioural Bias, Dar-Es-Salaam Stock Exchange, Investor Behaviour, Psychological Biases, Stock Markets, Survey Instrument

I. INTRODUCTION

The scholarly debate on how investors process information for decision-making has continued to evolve over the past few decades, with two dominant schools of thought emerging. The first school of thought supports the standard finance paradigm, also known as traditional finance. This perspective is grounded in established theories such as Markowitz portfolio theory; the option-pricing theory and the capital asset pricing model. The building block of this paradigm is that markets and market participants operate efficiently and systematically.

The efficient market hypothesis (EMH), introduced by Fama (1970), asserts that in an efficient market, the price of each security fully reflects all available information. According to the EMH, market participants are rational decision-makers, who act in their own self-interest and maintain consistent beliefs. As a result, they are expected to make rational choices when selecting among various alternatives (Kumar & Goyal, 2015). This perspective aligns with expected utility theory (EUT), which posits that when faced with uncertainty, investors will make decision that maximize their utility by choosing the alternative with the highest anticipated benefit (Kumar & Goyal, 2015).

Accordingly, this school of thought completely disregards personal limitations such as skills, values and unconscious reflexes, assuming that individuals make logical and coherent financial choices (Baker & Nofsinger, 2002; Barber & Thaler, 2003; Ricciardi, 2006). Following the establishment of the EMH, most of studies on market efficiency studied the predictability of stock returns. However, empirical studies such as those of Kahneman and Tversky (1979), De Bondt and Thaler (1985), and De Bondt and Thaler (1987) produced results which contradicted both the EMH and EUT.

During the 1960s and 1970s, the community of scholars and the investors witnessed the emergence of behavioural finance as an alternative school of thought. This perspective challenges the standard finance paradigm by and adopting an interdisciplinary approach to understanding investors' decision-making processes in financial markets. It integrates research from cognitive psychology, behavioural economics, investment theory, and financial

principles. Behavioural finance examines the behaviour of investors within real-life contexts by relaxing the assumptions of individual rationality assumption (Barber & Thaler, 2003).

The foundation of behavioural finance lies in prospect theory, developed by Kahneman and Tversky (1979) as an alternative to EUT. According to this theory, investors often deviate from making optimal judgements and choices, particularly when faced with significant risk or uncertainty (Baker & Nofsinger, 2002; Ricciardi, 2006). For example, rather than selecting the most optimal investment, an investor may settle for satisfactory one due to inherent limitations in human rationality. What's more, behavioural finance explores how investors react to losses and gains and the emotional difficulties they experience when realizing losses. Thus, investors are susceptible to both, cognitive and emotional biases, which can prevent them from maintaining a coherent perspective on their overall financial situation during decision-making (Nofsinger & Varma, 2007).

As noted earlier, research on the factors influencing investor decision-making behaviour has grown tremendously over the past few decades. However, most empirical behavioural finance studies have been conducted in the developed markets (see, for example, De Bondt & Thaler, 1985; De Bondt & Thaler, 1987; Barber & Odean, 2000; Barber & Odean, 2001; Glaser & Weber, 2007b; Graham et al., 2009). These studies primarily rely on secondary data-based data (see Kumar & Goyal, 2015) such as stock returns, trading volumes, and investor transaction records, or use experimental methods the effects of psychological constructs on investor behaviour.

A common limitation of these studies is their narrow focus on single type of investor behaviour or psychological bias, making it difficult to derive generalizable conclusions. Consequently, academics and practitioners in finance, economics, psychology, and decision sciences call for alternative approaches to examining the effects of psychological biases on investment decisions. While existing research provides valuable insights, it does not assess the relative importance of different biases or how deeply ingrained biases influence multiple aspects of individual investor behaviour.

To address this gap, Graham et al. (2009) used field data from the UBS/Gallup investor survey to directly measure the effects of psychological constructs on investor behaviour. Similarly, Waweru et al. (2008) employed a survey questionnaire with a limited number of items, relying on closed "Yes/No" responses to assess behavioural constructs among fund managers. However, this kind of questioning has limitations, as it restricts the respondents to predetermined choices, preventing a deeper and more detailed understanding of their perspectives.

This article aims to address the key question: which behavioural or psychological biases influence trading behaviour and decision-making of retail stock investors? To answer this, it is essential to have a reliable measurement scale. However, to the best of the researcher's knowledge, no valid and reliable instrument has been developed and validated for examining investor behaviour. According to Straub et al. (2004), instrument validation is a crucial step before testing any conceptual model as the reliability of findings and interpretations depends on the robustness of the tools used to collect data.

Therefore, the main objective of this paper it to outline the development of a survey tool for studying how retail stock investors make decisions and behave when trading. Specifically, the paper aims to: first, come up with a set of items (factors) that might explain trading behaviour and determine their relevance through an exploratory survey approach; second, confirm the representativeness of the selected items for a specific construct domain; and third, test the survey tool to test the reliability of the items.

The primary contribution of the paper is the development of a reliable instrument essential for measuring retail investor trading behaviour. The tool will be valuable for anyone studying or working in the field of behavioural finance, particularly for those interested in understanding how investors trade and why they behave in a particular manner while making investment decision.

The remainder of this paper is structured as follows: First, it presents the theoretical background on various behavioural theories and investment decision making. Next, it outlines the methodology used to develop and validate the survey instrument. This is followed by a discussion of the findings, and finally, the paper concludes with key insights and implications.

II. LITERATURE REVIEW

2.1 Theoretical Review

As stated earlier, behavioural finance emerged as a new concept after the energy crisis of the 1970s, when researchers, including Kahneman and Tversky (1979) found results that were inconsistent with EMH and EUT. Specifically, a good number of studies demonstrated that, during trading, investors often deviate from rational or logical decision-making and are instead influenced by various psychological and behavioural biases. This sparked interest among scholars, leading them to explore key questions such as: How do investors behave when making investment decisions, and why do they behave in a particular way? In the following section, we review six common behavioural biases that frequently impact retail investors' decision-making.

2.1.1 Availability Bias

Availability bias is a psychological behaviour that leads individuals to make judgements based on how easily one can recall, predict, or imagine an event, often relying on the most readily available information (Tversky & Kahneman, 1973; Hirshleifer, 2001). The literature suggests two key factors that influence decision-making based on recalled instances (see, Tversky and Kahneman, 1974): One is familiarity bias, which refers to the extent of one's knowledge about a particular subject. Accordingly, this bias can cause individuals to improperly assess the risks involved in a situation; hence leading them to make judgements based on distorted perceptions rather than objective analysis (see also Baker & Nofsinger, 2002). Two, recency bias - the tendency to base decisions on short-term memories, recent experiences, or highly salient events, as they are easier to recall.

Evidence from previous studies suggests that extreme stock performance (e.g., unusual trading volume or positive earnings), significantly influences the trading decisions of investors (De Bondt & Thaler, 1985, 1987; Barber & Odean, 2008). Other studies, e.g., by Shiller and Pound (1989), and Hirshleifer and Teoh (2003), suggest that investors often rely on social interactions or recommendations from analysts, relatives, etc., when making investment decisions.

2.1.2 Representativeness Bias

Representativeness bias refers to the tendency of making decisions or judgements based on stereotypes (Shefrin, 2002) or the extent to which data characteristics resemble a particular phenomenon, object, or the parent population (Tversky & Kahneman, 1973; Tversky & Kahneman, 1974). This bias often leads individuals to overlook relevant information when making decisions, resulting in a psychological error known as base-rate neglect. Another manifestation of representativeness bias occurs when people erroneously draw generalised conclusions based on too few observations, neglecting the effect of sample size (Kahneman & Tversky, 1972; Tversky & Kahneman, 1974).

The literature provides substantial evidence of the prevalence of representativeness bias in investors' trading behaviour. Barber et al. (2005), for instance, found a strong relationship between past successful performance and subsequent trading activity among Taiwanese day traders. Similar findings by Glaser and Weber (2009) and Nicolosi et al. (2009) report that investors tend to learn from their trading experiences, further reinforcing this bias.

2.1.3 Overconfidence Bias

Overconfidence is a cognitive bias that causes individuals to be excessively confident in their knowledge and skills, overestimate their ability to control events, and underestimate the risks associated with investments. This bias manifests in three forms: miscalibration, which is a tendency to overestimate the accuracy of one's private information, ability to perform tasks, and expectations about the future (Fischhoff et al., 1977); unrealistic optimism (better-than-average effect), which is a tendency to evaluate one's skills and personal attributes as superior to those of peers, often inaccurately (Graham et al., 2009); and illusion of control (self-attribution bias), which the belief that one has a greater influence over random events than is realistically possible (Gervais & Odean, 2001).

Empirical evidence demonstrates how overconfidence bias affects rational decision-making behaviour. For example, Odean (1999) found that overconfident investors engage in excess trading. Glaser and Weber (2007a) reported that investors who perceived themselves as above average in terms of investment skills or past performance traded more actively. Similarly, Graham et al. (2009) observed that overconfident investors had higher trading frequencies, while Barber and Odean (2000) found that excessive trading led to the realisation of lower returns.

2.1.4 Ambiguity Aversion

Aversion to ambiguity describes how individuals tend to make inconsistent, irrational, and less comprehensive decisions when faced with unfamiliar situations (see also Shefrin, 2002). People generally prefer certain outcomes over those with unknown probabilities, either due to limited cognitive capacity or a tendency to use simplifying strategies when making decisions.

One of the common manifestations of this bias in investment decision-making is the tendency of investors to hold insufficiently diversified portfolios (Benartzi & Thaler, 2001). Ambiguity-averse investors often prefer to invest in domestic stocks (home bias) or familiar companies or even in their own employer's stock (Benartzi, 2001; Barber & Thaler, 2003).

2.1.5 Regret Aversion

Regret aversion refers to how the expectation of regret affects individuals' decision-making (Zeelenberg, 1999). Studies suggest that individuals who exhibit regret aversion tend to avoid making decisions that may result in negative outcomes. They fear being perceived as having made a wrong choice (Shefrin & Statman, 1985), and the sense of being accountable for that decision aggravates the pain of regret (Shefrin, 2002). Examples of this bias in

investors include the tendency to sell winning investments too soon while holding onto loss making assets (Odean, 1998a, 1999; Nofsinger, 2005) and reluctance to invest in foreign stocks (Coval & Moskowitz, 1999).

2.1.6 Loss Aversion

Loss aversion is another important behavioural bias describing how individuals react after realising losses. Research (e.g., Kahneman & Tversky, 1979; Tversky & Kahneman, 1991, 1992; Barber & Thaler, 2003) suggests that the amount of pain one feels after losing is greater than the pleasure derived from an equivalent gain. However, this pain becomes less after experiencing prior gains.

Loss aversion manifests in three facets: Status quo bias – that is, where an individual chooses to do nothing or take a conservative stand by sticking to their initial decision when faced with multiple attractive options. This usually leads them to forfeit potential gains due to reluctance to change their portfolios. The second facet is the endowment effect, which describes the individuals' tendency to feel the loss of something more deeply than the pleasure of receiving the same thing. And the last is the disposition effect, which is associated with individuals' preference for realising gains, as it gives them a sense of pleasure, while avoiding the realisation of losses, which would indicate a past decision, was wrong. Various studies, such as those by Shefrin and Statman (1985), Odean (1998a), and Samuelson and Zeckhauser (1988), provide empirical evidence of the prevalence of loss aversion in trading decisions.

III. METHODOLOGY

3.1 The Instrument Development Approach

The main motivation for developing this instrument was that many previous studies on investor behaviour did not examine them directly, but instead they relied on proxies (see, for example, Shefrin & Statman, 1985; and Barber & Odean, 2000, 2001). While a few studies have employed survey designs (see, for example, Glaser & Weber, 2007a; and Graham et al., 2009), their focus was limited to examining the influence of only a few psychological biases.

The objective of this study was to develop a survey instrument from scratch that would allow researchers to examine both the individual and joint effects of behavioural biases in explaining investors' trading behaviour. The development process involved multiple stages, including item selection and creation, content validation, pre-testing, and a confirmatory study.

3.2 Selection and Creation of Items

The selection and creation of items were guided by the six common psychological theories discussed above and two investor trading behaviours. What's more, one or combinations of approaches were employed to develop the initial list of the survey questionnaire items for each of the behavioural constructs studied. Some items were formulated based on extensive review of the literature, while others were adopted from previous surveys and experimental studies and reworded to align them with contextual issues. This resulted in a total of 179 items across the following constructs: domestic stock preference (22), disposition effect (4), availability bias (28), representativeness (25), overconfidence (35), ambiguity aversion (36), regret aversion (24), and loss aversion (5).

3.3 Content Validation

This process was necessary since, as stated earlier, the survey instrument was developed from scratch with the view of capturing both the individual and joint effects of behavioural biases in explaining investors' trading behaviour, which is rare in investor psychology-related surveys. Accordingly, we validated the contents of the initial list of items by conducting an experience survey using scholars and experts or professionals (see Lawshe, 1975; Straub et al., 2004; Dwivedi et al., 2006; Saunders et al., 2009). The instrument contained the purpose of the study, a brief description of each of the constructs, and the completion instructions measuring the items in the pool on a three-point scale where 1 = not necessary, 2 = useful but not essential, and 3 = essential. Participants were also requested to assess how the survey instrument captured the expected dimensions and provide comments or suggestions as they deemed necessary.

Forty-nine (49) scholars were drawn from a list of behavioural finance authors whose articles were published in three-star or above peer-reviewed journals in the Academic Journal Quality Guide of the Association of Business Schools (ABS) list. We sent them the questionnaire through emails provided in their articles plus a request to complete it. Furthermore, nine colleagues who are experts in finance, marketing, and psychology-related fields, and seven brokers from firms operating at the Dar es Salaam Stock Exchange (DSE) were involved in the validation exercise. For the latter group, the drop-and-pick strategy was used to administer the tool. We received nine usable responses within the specified period as follows: scholars (3), brokerage firms (4), and colleagues (2).

The analysis involved determining the number of responses that rated each item as "essential" (see Lawshe, 1975). An item from the initial list was retained if at least half of the participants considered it "essential," indicating a

high degree of consensus on its content validity. Accordingly, the final instrument comprised 90 items across the following behavioural constructs: domestic stock preference (8), disposition effect (3), availability bias (15), representativeness (12), overconfidence (21), ambiguity aversion (14), regret aversion (14), and loss aversion (3).

3.4 Instrument Translation

The initial version of the instrument was in English. However, it was latter translated into Kiswahili language to accommodate respondents who might not be comfortable with completing the English version. As recommended by Brislin (1970) the author in collaboration with the National Kiswahili Council (BAKITA), used the back-translation technique – first translating the final survey tool from English to Kiswahili and then back to English - to ensure accuracy and reliability.

3.5 Field Testing of Instrument

As recommended in the literature (see, Saunders et al., 2009), the study conducted a pre-test of the resulting instrument for simplicity and clarity with a sample of 20 respondents, including 13 members of the academic staff within the Business School of Mzumbe University and seven brokers operating in brokerage firms. All respondents completed and returned the final version of the questionnaires within the given timeframe. Moreover, their responses were consistent with those given by the content validity experts and were deemed usable for analysis. Consequently, the instrument was implemented without further modifications.

Confirmatory Study

This section discusses the methodology of the confirmatory study and presents the findings from it.

The study used a cross-sectional design to collect data from individuals engaged in stock trading at the DSE. Non-probability sampling techniques, that is, convenience and snowball sampling, were deemed appropriate and more effective to reach out to a broader and diversified population of investors when there is a lack of a useful sampling frame. The researcher used two techniques to administer the survey instrument that contained the multi-item measures of each psychological construct thought to influence trading decisions. The items were measured on a five-point Likert scale ranging from 1(strongly disagree) to 5 (strongly agree).

The drop-and-pick method was employed by visiting various locations where stock investors could be found, like in broker offices, postgraduate classes, etc. However, due to the large geographical dispersion of investors and low participation of local investors in equity investments - attributed to financial literacy challenges, low public awareness, lack of understanding of market opportunities, and low-income levels (Mrindoko, 2011; Epaphra & Kiwia, 2021) - it became extremely difficult to reach all investors using only this method.

To address this problem, the study used Survey Monkey (www.surveymonkey.com), an online platform for creating and administering web-based questionnaires. Selected respondents received the survey link via email, text message, or personal messages through social media. Contacts were obtained from brokers that maintain client email addresses, group mailing lists, investor relations departments at the headquarters of listed companies, and personal connections, among other sources.

A total of 1,827 questionnaires were administered. By the end of the data collection process, 338 completed questionnaires were received, making a response rate of 19%. The breakdown shows that the researcher collected 160 questionnaires by hand and received 178 through the web. Out of the 178, however, 53 were partially completed, and the remaining 125 were fully completed.

3.6 Data Analysis

The following subsections outline the process undertaken by the researcher for data analysis.

Data Preparation: All collected questionnaires were coded and carefully entered into the Statistical Package for Social Sciences (SPSS). The data extracted from the questionnaires were then examined for completeness, consistency, and ambiguity in responses. It was found that 56 out of the 338 collected questionnaires were missing significant parts of information and were therefore discarded. Among the remaining questionnaires, 91 had minor omissions that, following the recommendations of Hair et al. (2006) and Malhotra (2008) were addressed by replacing the missing values with their series average. Furthermore, the researcher examined the presence of unengaged or out-of-range responses by computing the standard deviation of respondents' ratings on the 5-point Likert scale. This led to discarding two more questionnaires with minimal variation. The final sample consisted of 280 usable questionnaires, which was considered sufficient for further analyses (see also Glaser & Weber, 2007a; Graham et al., 2009).

Factor Analysis: Using participants' responses (280), we conducted a factor analysis to examine the factor structure of the remaining 90 items of the scale. Factor analysis is a statistical procedure that helps to reduce, regroup, and summarise a large amount of data to their essential components (Malhotra, 2008). The procedure works as follows: it extracts questions together into sets, called factors, each representing a hidden pattern or theme in the data. When analysed and interpreted properly, these factors help to understand the essence of the main idea behind what is

being measured (construct validity). This procedure was necessary because, as stated earlier, the survey instrument questions were composed by combining adopted items from studies and from scratch based on theory and the literature. In addition, the method was used to prune the data that did not seem to be essential and leave just a few that explain most of the observed variances.

The study used SPSS 16 to conduct principal component analysis (PCA) to assess the construct validity of various behavioural biases in trading decisions. PCA helps identify linear relationships among variables, reducing them to a smaller number of components. We employed direct oblimin rotation, which is suitable for measuring psychological constructs, as it allows factors to correlate realistically (Koh & Nam, 2005; Wee & Quazi, 2005).

Our analysis process involved rigorous criteria to ensure reliability and validity. For reliability of the questionnaire, the study employed the Cronbach's alpha (α) coefficient. This is a statistical method for assessing the internal consistency of items of each construct of the survey instrument (Hair et al., 2006; Saunders et al., 2009). The coefficients represent how much the items assess the same underlying construct and, in a way, cling together. In social sciences, the conventional cut-off point for the coefficient is 0.7 (Hair et al., 2006; Malhotra, 2008). However, Kline (2000) suggests that a value of 0.6 is considered realistic and an acceptable minimum level when dealing with psychological constructs.

Factor analysis was performed on a 90-item questionnaire derived from the eight constructs. Inspection of correlation matrices and communalities led to the removal of items with poor correlations and communalities below the 0.5 cut-off in successive iterations as suggested by Hair et al. (2006). The removal ensured compliance with PCA requirements, and it led the results to show strong correlations among items for most of the constructs, supporting the appropriateness of the analyses. The final analyses revealed acceptable factor loadings and explained significant proportions of variance. We assessed the factor models using Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure, both of which indicated the validity of our analyses. Furthermore, we employed eigenvalue analysis to determine the number of factors for various constructs related to behavioural biases in financial decision-making. An eigenvalue shows the degree of variance associated with the factor. We retained factors with eigenvalues greater than 1.0, as suggested by the literature (Straub et al., 2004; Hair et al., 2006; Malhotra, 2008).

IV. FINDINGS & DISCUSSION

4.1 Response Rate

Table 1 summarizes the alpha values that were estimated to examine the reliability of the constructs. Alpha ranged between 0.66 for the domestic stock preference construct and 0.86 for overconfidence construct. These coefficients indicate acceptable degree of reliability for all constructs of the instrument.

Table 1

Reliability of Measurements

Constructs	N	Number of Items	Eliminated Items	Cronbach's α
Domestic stock preference	280	8	5	0.66
Disposition effect	280	3	0	0.67
Availability bias	280	15	6	0.75
Representativeness bias	280	12	9	0.71
Overconfidence	280	21	7	0.86
Ambiguity aversion	280	14	7	0.71
Regret aversion bias	280	14	6	0.71
Loss aversion	280	3	1	0.72

4.1.1 Trading Behaviour

Trading behaviour is the response variable in the context of this study. As suggested in the behavioural finance literature, it was proxied by two behavioural biases which investors portray as detailed hereunder: Domestic Stock Preference: As presented in Table 1, we conducted factor analysis for eight items for the domestic stock preference (DSP) construct. An examination of the correlation matrix revealed that three items had poor correlation with others. The results further showed that two items of the construct had communalities below the 0.5 cut-off. Based on these reasons, the five items were excluded from further analysis. The final analysis for the remaining items presented in Table 2 led to one factor loading whose coefficients exceeded the minimum accepted level of 0.7, explaining over 60% of the total variance. The KMO measure verified the sampling adequacy for the analysis. The coefficient of the Cronbach's alpha was moderate at 0.66, indicating acceptable internal consistency (Kline, 2000).

Table 2
Results for Domestic Stock Preference

Component	α	# items	Question Code	Factor
				I
DOM	0.66	3	DSP-3	0.836
			DSP-2	0.737
			DSP-4	0.713
Total Variance Explained				
Initial Eigenvalues Total				1.80
Initial Eigenvalues % of Variance (total)				60.12

4.1.2 Disposition Effect

The correlation matrix indicated that all items used to measure the disposition effect (DE) construct were strongly correlated. The KMO and the Bartlett's test of sphericity confirmed the suitability of the data for carrying on the factors analysis, which extracted a single component that explains over 60% of the variances (see Table 3). The Cronbach's alpha was moderate at 0.67.

Table 3
Results for Disposition Effect

Component	α	# items	Question Code	Factor
				I
DE	0.67	3	DEF-3	0.835
			DEF-2	0.789
			DEF-1	0.708
Total Variance Explained				
Initial Eigenvalues Total				1.82
Initial Eigenvalues % of Variance (total)				60.70

4.1.3 Availability Bias

The study used 15 items to perform a factor analysis of the availability bias constructs. The analysis was preceded by an examination of the correlation matrix. It was found that there is a strong association among the items. However, six items were discarded due to cross-loading and lower communality problems in several iterations of the PCA. The KMO measure and Bartlett's test of sphericity verified the sampling adequacy for proceeding with factor analysis using the remaining nine items. Based on Eigenvalue criteria, three components were selected from the final analysis. These factors explain over 65% of the total variations of the items of the construct (see Table 4). The three factors extracted were named as *the tendency to overweigh recent salient information (recency bias), reliance on experts, and social influence*. The rationale for the naming of the components is presented under discussion. The alpha coefficients for the entire construct and the individual factors were above 0.7, indicating good internal consistency for the constructs.

Table 4
Results for Availability Bias

Component	α	# items	Question Code	Factor		
				I	II	III
Scale1_ recency bias	0.74	4	REC-4	**0.780**	0.044	0.000
			REC-3	**0.768**	-0.063	0.026
			REC-6	**0.738**	0.081	-0.106
			REC-2	**0.697**	-0.061	0.126
Scale2_advocate recommendation	0.78	2	ADR-2	-0.028	**0.912**	0.028
			ADR-3	0.029	**0.897**	-0.003
Scale3_social influence	0.74	3	ADR-5	-0.051	-0.008	**0.840**
			ADR-6	-0.001	-0.047	**0.827**
			ADR-1	0.083	0.086	**0.742**
Total Variance Explained						
Initial Eigenvalues Total				3.00	1.79	1.11
Initial Eigenvalues % of Variance (total 65.61%)				33.38	19.94	12.30

4.1.4 Representativeness Bias

The initial list for conducting the factor analysis contained 12 items for measuring the influence of representativeness bias on the trading behaviour of retail investors. The communalities and sampling adequacy tests resulted in the removal of nine items due to low loadings. As shown in Table 5, the factor analysis result for this construct yielded one component (named extrapolation of past performance) explaining 63.71% of the variances, with all variables loading above 0.7, and a Cronbach's alpha of 0.71, suggesting that the internal consistency of the factor is reliable.

Table 5

Results for Representativeness Bias

Component	**α**	**# items**	**Question Code**	**Factor**
				I
Scale4_sample size	0.71	3	SSN-3	0.823
			SSN-4	0.802
			SSN-10	0.768
Total Variance Explained				
Initial Eigenvalues Total				1.91
Initial Eigenvalues % of Variance (total)				63.71

4.1.5 Overconfidence Bias

This initial list for this construct included 21 items in the factor analysis. However, an examination of the communalities and the pattern of factor loadings revealed that two items had lower values than the acceptable cut-off point. In addition, three items were found to have a cross-loading issue. Thus, a total of five items were removed from further analysis. The KMO and the Bartlett's test of sphericity suggested it was appropriate to proceed with factor analysis. Accordingly, five factors emerged as presented in Table 6, explaining 67.24% of the variance, with an overall Cronbach's alpha of 0.86, indicating strong internal consistency. Specifically, the better-than-average bias resulted in three sub-factors labelled perceived competence, perceived trading knowledge, and perceived self-confidence. For the illusion of control bias, two components named *self-attribution* and *reaction to upcoming news* emerged. A further examination of the individual components revealed that the factor labelled *reaction to upcoming news* had an unacceptably low Cronbach's alpha value of 0.48; hence, it was discarded.

Table 6

Results for Overconfidence Bias

Component	**α**	**# items**	**Question Code**	**Factor**				
				I	**II**	**III**	**IV**	**V**
Scale5_competence	0.86	6	BTA-8	**0.914**	0.021	-0.040	-0.044	-0.076
			BTA-6	**0.808**	-0.058	0.096	-0.040	0.015
			BTA-7	**0.780**	0.071	0.105	0.057	-0.008
			BTA-4	**0.714**	0.151	-0.134	0.038	0.044
			BTA-9	**0.598**	0.023	0.112	0.259	-0.054
			BTA-5	**0.597**	-0.107	0.138	-0.141	0.276
Scale6_trading knowledge	0.69	2	BTA-13	0.041	**0.830**	0.096	-0.066	0.078
			BTA-12	0.150	**0.753**	0.084	0.116	0.003
Scale7_ self-attribution	0.77	4	IOC-5	-0.086	0.052	**0.847**	0.012	-0.062
			IOC-6	-0.027	0.185	**0.758**	-0.066	0.049
			IOC-7	0.160	-0.015	**0.705**	0.057	0.049
			IOC-8	0.216	-0.261	**0.569**	0.184	0.073
Scale8_reaction to upcoming news	0.48	2	IOC-1	0.086	-0.164	0.082	**0.801**	-0.061
			IOC-2	-0.078	0.212	-0.037	**0.751**	0.161
Scale9_ self-confidence	0.65	2	BTA-1	0.056	-0.070	0.020	-0.003	**0.865**
			BTA-2	-0.065	0.109	-0.025	0.067	**0.809**
Total Variance Explained								
Initial Eigenvalues Total				5.65	1.71	1.33	1.07	1.01
Initial Eigenvalues % of Variance (total 67.24%)				35.30	10.68	8.28	6.66	6.31

4.1.6 Ambiguity Aversion

The study initially used 14 items of ambiguity aversion to conduct factor analysis. Examination of the correlation matrix led to the removal of two items that fell below the recommended minimum of 0.3. In addition, five items were discarded due to low loadings. A further examination of the KMO and Bartlett's test of sphericity indicated that the model satisfied the criteria for performing factor analysis. Table 7 presents the result of the final rotated matrix of the ambiguity aversion construct. Three factors were identified and labelled belief in principles, need for adequate information, and wary of uncertainty. The three components explained over 73% of the variance, with Cronbach's alpha values exceeding 0.70 for each scale factor, indicating commendable reliability.

Table 7

Results for Ambiguity Bias

Component	α	# items	Question Code	Factor		
				I	II	III
Scale10_ belief in principles	0.70	3	AMA-5	0.854	-0.112	0.025
			AMA-4	0.851	0.069	-0.117
			AMA-7	0.599	0.080	0.219
Scale11_ need for adequate information	0.81	2	AMA-11	-0.019	0.925	-0.023
			AMA-12	0.021	0.908	0.023
Scale12_ wary of uncertainty	0.70	2	AMA-13	-0.064	0.020	0.903
			AMA-14	0.089	-0.018	0.825
Total Variance Explained						
Initial Eigenvalues Total				2.60	1.52	1.02
Initial Eigenvalues % of Variance (total 73.47%)				37.20	21.72	15.54

4.1.7 Regret Aversion

The study performed PCA on 14 items of the attributes of regret aversion bias. Six items were dropped due to communality problems. The Bartlett's test of sphericity confirmed the appropriateness of the factor model while the KMO verified the adequacy of the sample. The final rotation of the matrix generated three components (see Table 8) representing the information of the remaining eight items. The factors were labelled as need for assurance, a strong-willed/adamant individual, and fear of regret. The three components together accounted for 66.62% of the variance. However, reliability analysis for the first two factors indicated that they were relatively low but acceptable (Kline, 2000). The Cronbach's alpha for the last factor was above 0.7; hence, all factors were retained.

Table 8

Results for Regret Aversion

Component	α	# items	Cases	Question Code	Factor		
					I	II	III
Scale13_assurance	0.78	3	280	RGA-9	0.877	-0.085	-0.029
				RGA-10	0.804	0.021	0.107
				RGA-8	0.762	0.178	-0.002
Scale14_adamant	0.62	2	280	RGA-14	-0.045	0.851	0.141
				RGA-13	0.118	0.819	-0.115
Scale15_fear of regret	0.61	3	280	RGA-2	-0.129	0.139	0.820
				RGA-3	0.059	-0.058	0.756
				RGA-5	0.247	-0.103	0.596
Total Variance Explained							
Initial Eigenvalues Total					2.88	1.36	1.09
Initial Eigenvalues % of Variance (total 66.62%)					35.97	16.99	13.66

4.1.8 Loss Aversion

The study initially included three items to assess loss aversion bias. An investigation of the correlation matrix confirmed the suitability of proceeding PCA. However, item was removed after one iteration. A further examination of the KMO and Bartlett's test of sphericity confirmed that the minimum requirements for performing factor analysis were met. As shown in Table 9, as single factor explaining over 78% of total variance with acceptable internal consistency was extracted.

Table 9

Results for Loss Aversion

Component	α	# items	Question Code	Factor
				I
Scale16_fear of loss	0.72	2	LOA-3	0.885
			LOA-2	0.885
Total Variance Explained				
Initial Eigenvalues Total				1.57
Initial Eigenvalues % of Variance (total)				78.31

4.2 Final Investor Trading Behaviour Scale

Table 10 presents the final list of items used examine the behavioural biases that influence trading behaviour and decision-making of retail stock investors. This list was developed and validated according to the process outlined earlier. It contains 49 items included in the survey instrument, covering the response variable (i.e., trading behaviour) and dependent variables (i.e. six well-established and common behavioural biases). Seventeen constructs that the requirements of factor analysis emerged from the variables. Out of these, seven constructs (Scale2_advocate recommendation, Scale6_trading, Scale9_ self-confidence, Scale11_ need for adequate information, Scale12_ wary of uncertainty, knowledge, Scale14_adamant and Scale16_fear of loss) each consisted of two items. Another seven constructs (DOM, DE, Scale3_social influence, Scale4_sample size, Scale10_ belief in principles, Scale13_assurance, and Scale15_fear of regret) were composed of three items each. The two constructs that are Scale1_ recency bias and Scale7_ self-attribution, were represented by four items each. The Scale5_competence consisted of six items. Appendix I provides the scale along with its corresponding ratings, facilitating adoption and interpretation by readers.

Table 10

List of Constructs and Items to Examine Investor Trading Behaviour

Construct	Items
Trading behaviour	
Domestic stock preference (DOM)	DSP-3: I would rather have in my stock portfolio just a few companies that I know well than in many companies that I know little about
	DSP-2: I do not like to invest my money in unfamiliar investments because they are risky
	DSP-4: I invest in companies I know well because I believe I can anticipate the returns
Disposition effect (DE)	DEF-3: If stocks I purchased loses, I prefer to wait to claim my losses
	DEF-1: I am very likely to sell something if it experiences price increase than price decrease
	DEF-4: In case of loss positions in my investment I generally wait for a price rebound instead of selling those securities
Availability bias	REC-4: I can easily recall information that has arrived recently
	REC-3: I usually focus on the more recent results of a particular type of business when deciding whether to invest in it or not.
	REC-6: Market-related news e.g. stock price movements, form the basis of my investment decisions
	REC-2: Do you think you can decide (continue) to trade at the DSE following a high abnormal trading volume on a particular company's stock?
	ADR-2: I normally act on professional advice
	ADR-3: By relying on experts' advice, I enhance the efficiency of my decisions
	ADR-5: Suppose you have some money to invest, and you hear about a great business tip from your neighbour who is known to have entrepreneurial sense. Will you invest into that business based on the neighbour's tip, and who is usually right about these thing
	ADR-6: Decisions of friends significantly influences my decisions to participate in a particular business or social event
	ADR-1: I believe the information I get from my close friends and relatives as reliable source or reference for my decisions
Representativeness bias	SSN-3: I avoid stocks that have performed poorly in the recent past
	SSN-4: I consider recent past returns to be representative of what investors should expect in the future
	SSN-10: I examine past returns when deciding which stock to buy
Overconfidence bias	BTA-8: I am confident that I can perform effectively on many different tasks
	BTA-6: I believe I can succeed at most any endeavour to which I set my mind

	BTA-7: I will be able to successfully overcome many challenges
	BTA-4: When facing difficult tasks, I am certain that I will accomplish them
	BTA-9: Compared to other people, I can do most tasks very well
	BTA-5: In general, I think that I can obtain outcomes that are important to me
	BTA-13: I clearly understand how to trade at the stock exchange market
	BTA-12: Learning to trade on stock markets was easy for me
	IOC-5: My life is determined by my own actions
	IOC-6: I can pretty much determine what will happen in my life
	IOC-7: When I make plans, I am almost certain to make them work
	IOC-8: When I get what I want, it is usually because I worked hard for it
	BTA-1: How do you assess your own performance in stock investment – compared to other investors?
	BTA-2: I could succeed at making profit from my stock investment, even though many other investors would fail
Ambiguity bias	AMA-5: Practically, every problem has a solution
	AMA-4: There is a right way and a wrong way to do almost everything
	AMA-7: Nothing gets accomplished in this world unless you stick to some basic rules
	AMA-11: I have all the relevant information I need to make my investment decision
	AMA-12: I have sufficient information to make a sound investment decision
	AMA-13: I need more information to make a good investment decision
	AMA-14: I do not like things to be uncertain and unpredictable
Regret aversion	RGA-9: I want to be sure before I purchase anything
	RGA-10: I avoid risky things
	RGA-8: I would rather be safe than sorry
	RGA-13: If stocks I purchased lose, I don't wait to claim my losses
	RGA-14: I consider investing to be safe
	RGA-2: If the price of an asset I wanted to sell declines after a purchase, I will hold instead of selling it
	RGA-3: I get very distressed if I believe I could have anticipated and prevented a poor outcome
	RGA-5: I get upset when I find that the decision I made has resulted to a bad outcome
Loss aversion	LOA-3: I worry of incurring a great loss when making investment decision
	LOA-2: It is very likely to lose money when making investments

4.3 Discussion

This section provides a brief discussion on the concepts underlying the factors proposed for this study.

The analysis of current literature suggests that most existing studies on investment decision-making are based on observations or experiments (see, for example, Kahneman & Tversky, 1979; Tversky & Kahneman, 1991, 1992; Barber & Thaler, 2003; Graham et al., 2009; De Bondt & Thaler, 1985, 1987; Barber & Odean, 2008). There are very few studies that rely on primary data or adopt a qualitative approach (Kumar & Goyal, 2015). Consequently, despite a growing trend in the use of primary data over the past decade, the literature indicates that there is still significant potential to gain a deeper understanding of investor behaviour in financial decision-making through primary data.

Retail investors are the primary participants in investment markets. However, this group of investors is highly unaware of the challenges that influence their decision-making (Graham et al., 2009; Kumar & Goyal, 2015). For this reason, analysing their trading behaviours provides deeper insights into the key psychological and structural factors that shape investment decisions (Graham et al., 2009). Just as stigmatisation studies focus on those directly affected, examining retail investors' decisions, rather than relying solely on institutional perspectives, allows for a more precise understanding of the behavioural tendencies that drive investment choices across different asset classes.

What plagues all attitudinal surveys, especially (see for example, Kumar & Goyal, 2015) those examining retail investors' decision-making, is the influence of socially desirable biases. This tendency to give socially desirable (and sometimes false) responses is primarily driven by the state of trying to present oneself as good or knowledgeable, or as a financially prudent investor, just to protect one's self-image. For instance, often investors overestimate their ability to predict market trends due to what Graham et al. (2009) refer to as investor competence bias. Similarly, respondents may respond in a socially desirable way to questions probing about sensitive issues like past losses. They may act defensively to rationalise those past investment mistakes in a way that will show they were not wrong (Nofsinger, 2005). Accordingly, these social desirability distortions can affect the validity of survey-based research, as responses may not fully capture the true psychological and behavioural factors driving investment decisions. To

address this issue, this instrument framed questions indirectly to reduce the participants' feeling of personal accountability and ensured anonymity and confidentiality.

The rationale for naming the first construct *domestic stock preference (DOM)* is that it represents a set of elements indicating investors' tendency to prefer domestic securities over foreign assets in their investment portfolios. This interpretation is consistent with the previous literature (see, for example, French & Poterba, 1991), which suggests that individual investors exhibit home bias, that is, they show preference for investing in familiar or local markets rather than holding internationally diversified portfolios. The second construct was named *disposition effect (DE)* because the items represent the typical tendency of investors to hesitate when selling loss making assets. This phenomenon is well supported by empirical evidence, such as Shefrin and Statman (1985) and Odean (1998a) who observed that investors are prone to the disposition effect.

Considering the underlying meaning, the construct Scale1 was labelled *recency bias* as the items that have loaded together appears to represent investors' tendency to react more strongly to recent information. These findings are empirically consistent with those of Odean (1999) and Gervais et al. (2001) who documented that many investor chase stocks that have recently caught their attention in anticipation of favourable prospects. Likewise, *Scale2_advocate recommendation* reflects investors' predisposition to rely on or trust information received from others or external sources e.g., stock analysts, experts or relatives over their own judgements. For example, Shiller and Pound (1989) observed consultations with professionals influenced investors' interest in a particular company, while Kliger and Kudryavtsev (2010) documented that analysts' revisions impacted stock price reactions. Moreover, *Scale3_social influence* is named social influence because the set of items suggest that investors make decisions based on social interactions. This is consistent with the findings of Kaustia and Knüpfer (2012), who asserted that investors' participation in trading was based by hearing success stories from peers. Other studies, such as those by Hong et al. (2004), also suggest that decisions of investors are sometimes shaped by sharing interests with friends or talking with friends and colleagues about investment challenges.

The factor loading for scale4 was named *sample size* because the items align well with the literature suggesting that investors tend to ignore long-term averages and place greater weight on recent experiences or new evidence. According De Bondt and Thaler (1985, 1987), this type of reasoning – making inferences from too few observations - is referred to as sample-size neglect. Similarly, the factor loading for scale5 was termed as *competence* because the items suggest that investors tend to perceive themselves as above average in terms of skills, knowledge or past performance. Likewise, some investors believe that, since they have been trading for some time, their trading ability has improved (see also, Seru et al., 2010; Nicolosi et al., 2009). The items that loaded onto Scale6 correspond to this tendency and it was therefore labelled trading knowledge. The factor labelled Scale7_ self-attribution was named as such because the items loading onto this construct reflect the common tendency of investor to mistakenly attribute their success to their own ability (see also, De Long et al., 1990). Another construct of overconfidence bias was termed as Scale9_ self-confidence because its items correspond to susceptibility to self-confidence bias, which is a variant of better-than-average effect within overconfidence bias.

The rationale for naming scale10 as *belief in principles* is that the items constituting it reflect a strong in belief in structure, order, and rules in decision-making and solving problems. This interpretation is consistent with Graham et al. (2009) who suggest that individuals who perceive themselves as competent make decisions based on their knowledge. Similarly, scale11 was named *need for adequate information* because the items highlight the importance of having sufficient and relevant information for making informed investment decisions. Scale12 was named *wary of uncertainty* as its items indicate investors' discomfort with ambiguity and unpredictability in trading decisions. These observations are consistent with Benartzi (2001), who found that investors feel safer investing in familiar companies because they have complete information about them.

The basis for labelling scale13 as *assurance* is that the items loading suggest a cautious approach in decision-making. According to Coval and Moskowitz (1999), investors' unwillingness to invest in foreign stocks exemplifies this tendency, as they seek certainty before making purchases and actively avoid risks. Scale14 was labelled *adamant* as the construct suggests a firm and resolute investment approach, where investors are expected to decisively cut losses and view investing as a secure activity. However, previous studies, such as Odean (1998a), show that investors often hold onto losses for so long. Scale15 was named *fear of regret* because its items suggest a strong aversion to regret in investment decisions, such as avoiding selling at a loss or experiencing emotional discomfort due to unfavourable outcomes. Similarly, the items in scale16 suggest concerns of investors about potential financial losses and their apprehension when making decisions. It was, therefore, labelled *fear of loss* to reflect the risk averse mind set driven by loss aversion.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

Although this study examined retail trading decisions in the stock market using data from the Dar es Salaam Stock Exchange, the essence of investment decision-making applies broadly across various domains. Whether investing in bonds, collective investments like unit trusts, starting a business in transport or retail, real estate development, farming, or livestock keeping, and more others, the underlying behavioural patterns remain relevant. Moreover, these investment decisions transcend geographical and ethnic boundaries, as they can be made by individuals of any ethnic background, anywhere in the world.

The key question that this instrument is addresses is: Which behavioural or psychological biases influence trading behaviour and decision-making of retail stock investors? As stated earlier, some existing studies focus on single type of investor behaviour or psychological bias, making it difficult to derive generalizable conclusions. To our knowledge, there is no survey instrument to date that examines multiple psychological biases within a single study.

This paper, therefore, describes the development process of an instrument that examines retail investor trading behaviour. The process involved multiple stages, including item selection and creation, content validation, field testing, and a confirmatory study. Accordingly, the initial questionnaire consisted of items developed from scratch for each behavioural construct and others were adopted from previous studies and reworded to align with contextual issues. Content validation was conducted through an expert survey with scholars and professionals who assessed the relevance and adequacy of the initial items list on a three-point scale. An item was retained if at least half of the participants considered it essential. The final instrument, which was subjected to confirmatory study, included 90 items across eight behavioural constructs. The confirmatory study tested whether the survey items accurately measured the intended behavioural constructs, ultimately refining the survey instrument to 49 items across eight behavioural constructs, and seventeen scales, all of which have acceptable levels of content validity, reliability and construct validity.

5.2 Recommendations

This study has demonstrated that investment decision-making is influenced by behavioural biases across various domains. It therefore recommends that future research should expand the application of this survey instrument beyond stock trading. Additionally, since psychological biases transcend geographical and ethnic boundaries, future studies should conduct cross-cultural validations to examine how these biases influence investment behaviour across different markets and investor demographics. Finally, policymakers and financial educators should incorporate behavioural insights into investor education programmes to mitigate the negative effects of biases on decision-making.

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APPENDIX I: KOMBA'S BEHAVIORAL BIASES SCALE FOR RETAIL INVESTOR TRADING BEHAVIOUR

This questionnaire is designed to assess the influence of various psychological biases on retail investor trading behaviour. Respondents are requested to rate each statement based on their personal investment experience. Please indicate the extent to which you agree or disagree with each statement using the following scale:

Key: *1 = Strongly disagree; 2 = Disagree; 3=Neutral; 4=Agree; 5 = Strongly agree.*

Domestic stock preference	
I would rather have in my stock portfolio just a few companies that I know well than in many companies that I know little about	1☐ 2☐ 3☐ 4☐ 5☐
I do not like to invest my money in unfamiliar investments because they are risky	1☐ 2☐ 3☐ 4☐ 5☐
I invest in companies I know well because I believe I can anticipate the returns	1☐ 2☐ 3☐ 4☐ 5☐
Disposition effect	
If stocks I purchased loses, I prefer to wait to claim my losses	1☐ 2☐ 3☐ 4☐ 5☐
I am very likely to sell something if it experiences price increase than price decrease	1☐ 2☐ 3☐ 4☐ 5☐
In case of loss positions in my investment I generally wait for a price rebound instead of selling those securities	1☐ 2☐ 3☐ 4☐ 5☐
Availability bias	
I can easily recall information that has arrived recently	1☐ 2☐ 3☐ 4☐ 5☐
I usually focus on the more recent results of a particular type of business when deciding whether to invest in it or not.	1☐ 2☐ 3☐ 4☐ 5☐
Market-related news e.g. stock price movements, form the basis of my investment decisions	1☐ 2☐ 3☐ 4☐ 5☐
Do you think you can decide (continue) to trade at the DSE following a high abnormal trading volume on a particular company's stock?	1☐ 2☐ 3☐ 4☐ 5☐
I normally act on professional advice	1☐ 2☐ 3☐ 4☐ 5☐
By relying on experts' advice, I enhance the efficiency of my decisions	1☐ 2☐ 3☐ 4☐ 5☐
Suppose you have some money to invest, and you hear about a great business tip from your neighbour who is known to have entrepreneurial sense. Will you invest into that business based on the neighbour's tip, and who is usually right about these thing	1☐ 2☐ 3☐ 4☐ 5☐
Decisions of friends significantly influences my decisions to participate in a particular business or social event	1☐ 2☐ 3☐ 4☐ 5☐
I believe the information I get from my close friends and relatives as reliable source or reference for my decisions	1☐ 2☐ 3☐ 4☐ 5☐
Representativeness bias	
I avoid stocks that have performed poorly in the recent past	1☐ 2☐ 3☐ 4☐ 5☐
I consider recent past returns to be representative of what investors should expect in the future	1☐ 2☐ 3☐ 4☐ 5☐
I examine past returns when deciding which stock to buy	1☐ 2☐ 3☐ 4☐ 5☐
Overconfidence bias	
I am confident that I can perform effectively on many different tasks	1☐ 2☐ 3☐ 4☐ 5☐
I believe I can succeed at most any endeavour to which I set my mind	1☐ 2☐ 3☐ 4☐ 5☐
I will be able to successfully overcome many challenges	1☐ 2☐ 3☐ 4☐ 5☐
When facing difficult tasks, I am certain that I will accomplish them	1☐ 2☐ 3☐ 4☐ 5☐
Compared to other people, I can do most tasks very well	1☐ 2☐ 3☐ 4☐ 5☐
In general, I think that I can obtain outcomes that are important to me	1☐ 2☐ 3☐ 4☐ 5☐
I clearly understand how to trade at the stock exchange market	1☐ 2☐ 3☐ 4☐ 5☐
Learning to trade on stock markets was easy for me	1☐ 2☐ 3☐ 4☐ 5☐
My life is determined by my own actions	1☐ 2☐ 3☐ 4☐ 5☐
I can pretty much determine what will happen in my life	1☐ 2☐ 3☐ 4☐ 5☐
When I make plans, I am almost certain to make them work	1☐ 2☐ 3☐ 4☐ 5☐
When I get what I want, it is usually because I worked hard for it	1☐ 2☐ 3☐ 4☐ 5☐
How do you assess your own performance in stock investment – compared to other investors?	1☐ 2☐ 3☐ 4☐ 5☐
I could succeed at making profit from my stock investment, even though many other investors would fail	1☐ 2☐ 3☐ 4☐ 5☐
Ambiguity bias	

Practically, every problem has a solution	1☐ 2☐ 3☐ 4☐ 5☐
There is a right way and a wrong way to do almost everything	1☐ 2☐ 3☐ 4☐ 5☐
Nothing gets accomplished in this world unless you stick to some basic rules	1☐ 2☐ 3☐ 4☐ 5☐
I have all the relevant information I need to make my investment decision	1☐ 2☐ 3☐ 4☐ 5☐
I have sufficient information to make a sound investment decision	1☐ 2☐ 3☐ 4☐ 5☐
I need more information to make a good investment decision	1☐ 2☐ 3☐ 4☐ 5☐
I do not like things to be uncertain and unpredictable	1☐ 2☐ 3☐ 4☐ 5☐
Regret aversion	
I want to be sure before I purchase anything	1☐ 2☐ 3☐ 4☐ 5☐
I avoid risky things	1☐ 2☐ 3☐ 4☐ 5☐
I would rather be safe than sorry	1☐ 2☐ 3☐ 4☐ 5☐
If stocks I purchased lose, I don't wait to claim my losses	1☐ 2☐ 3☐ 4☐ 5☐
I consider investing to be safe	1☐ 2☐ 3☐ 4☐ 5☐
If the price of an asset I wanted to sell declines after a purchase, I will hold instead of selling it	1☐ 2☐ 3☐ 4☐ 5☐
I get very distressed if I believe I could have anticipated and prevented a poor outcome	1☐ 2☐ 3☐ 4☐ 5☐
I get upset when I find that the decision I made has resulted to a bad outcome	1☐ 2☐ 3☐ 4☐ 5☐
Loss aversion	
I worry of incurring a great loss when making investment decision	1☐ 2☐ 3☐ 4☐ 5☐
It is very likely to lose money when making investments	1☐ 2☐ 3☐ 4☐ 5☐