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BEHAVIOURAL BIASES IN INVESTMENT DECISIONS: COMPONENT FACTORS EXTRACTION

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ABSTRACT

This paper seeks to explore the component factors of the behavioural biases that prevail among individual investors at the Nigerian stock market. This is an important input in developing the structural model that could be used to ascertain the influence of these biases on individuals' investment performance. It adopts a survey strategy in an exploratory manner through exploratory factor analysis (EFA) using the maximum likelihood estimation approach. The paper finds that four major factors, represented by the theories of heuristics, prospect, market and herding, are indicated by the factor structure matrix. The four factors extracted explain 73.94% of the total variance of all the measurement items in the model. The factors were further validated via the Cronbach's Alpha reliability statistic. The paper, therefore, concludes that the factors extracted are reliable and could be used as the exogenous variables in determining the influence of behavioural factors on individual investors' performance at the Nigerian stock market. It further recommends that these factors should be subjected to convergent and discriminant validity tests to ascertain their uniqueness.

KEYWORDS: *Behavioural bias, exploratory factor analysis, component factors, Nigerian Stock Market.*

1.0 INTRODUCTION

The Efficient Markets Hypothesis (EMH) assumes that investors can rationally form unbiased expectations about the future and the risks involved. Behavioural finance questions the validity of this assumption and proposes that investors form erroneous beliefs or behavioural bias about the future distribution of returns on risky assets. It applies psychological theories to indicate that investors cannot always update their beliefs or take decisions under risky situations as correctly as suggested by the EMH. Instead, they could be biased in collecting, receiving, and updating information, and in drawing conclusions. For example, investors may form their beliefs using rules of thumb or some other irrational procedures (Slovic, 1972; Tversky & Kahneman, 1974).

This paper, therefore, intends to ascertain the maximum number of factors (theories) that could be extracted from the various bias tendencies among individual investors at the Nigerian stock market. To achieve this objective, the paper asks the following questions; what are the behavioural biases that prevail among individual investors at the Nigerian stock market? To which factors (major theories) does each of the bias tendencies belong?

2.0 LITERATURE REVIEW

Behavioral biases are systematic patterns of deviation from norm or rationality in judgment, and are often studied in the new paradigm of financial research called behavioral finance (Haselton, Nettle, & Andrews, 2005), these biases were confirmed to existed by replicable studies (Oliver, 2018), and leads to distortions in capital market (Gocejna, 2017). According to Ritter (2003), behavioural finance is based on psychology, which suggests that human decision processes are subject to several cognitive illusions. These illusions are classified into 2 categories: illusions caused by heuristics and illusions caused by the using of mental frames classified in the prospect theory (Waweru, Munyoki, and Uliana, 2008). These two categories as well as market and herding theories are included in this research model to have a comprehensive understanding of the behavioural bias tendencies.

2.1.0 Heuristic theory

Ritter (2003), defined heuristics as the rules of thumb, which makes decision making easier, especially in complex and uncertain environments. It reduces the complexity of assessing probabilities and predicting values to simpler judgments (Kahneman & Tversky, 1974). Kahneman and

Tversky are the first writers to study the factors belonging to heuristics when they introduced representativeness, availability bias, and anchoring (Kahneman & Tversky, 1974). Gambler's fallacy and Overconfidence were also listed into heuristic theory (Waweru et al. 2008).

2.1.1 Representativeness refers to the degree of similarity that an event has with its parent population (DeBondt & Thaler, 1985) or the degree to which an event resembles its population (Kahneman & Tversky, 1974). Representativeness may result in some biases such as people put too much weight on recent experience and ignore the average long-term rate (Ritter, 2003). A typical example for this bias is that investors often infer a company's high long-term growth rate after some quarters of increasing returns (Waweru et al., 2008). In stock market, representativeness prevails, when investors seek to buy "hot" stocks instead of poorly performed ones.

2.1.2 Gamblers' fallacy arises when people predict inaccurately the reverse points which are considered as the end of good (or poor) market returns (Waweru et al., 2008).

2.1.3 Anchoring is a phenomena that occurs in the situation when people use some initial values to make estimation, which are biased toward the initial ones as different starting points yield different estimates (Kahneman & Tversky, 1974). In financial market, anchoring arises when a value scale is fixed by recent observations. Investors always refer to the initial purchase price when selling or analyzing their stock. Thus, prices of today are often determined by those of the past. Anchoring influence investors to assign a range for a share market price or company's returns based on the historical trends, leading to under-reaction to unexpected price changes. Anchoring has some similarities with representativeness as it also suggests that people often focus on recent experience and use to be become more optimistic when the prices rises and more pessimistic when the prices falls (Waweru et al., 2008).

2.1.4 Overconfidence: This prevails when people overestimate the reliability of their knowledge and skills (DeBondt & Thaler, 1985, Hvide, 2002). Many studies show that excessive trading is one effect of investor's overconfidence.

2.1.5 Availability bias happens when people make use of easily available information excessively. In stock trading area, this bias manifest itself through the preference of investing in local companies which investors are familiar with or easily obtain information, despite the fundamental principles so-called diversification of portfolio management for optimization (Waweru et al., 2008). In this research, five components of heuristics: overconfidence, gambler's fallacy, availability bias, anchoring, and representativeness are included in the model.

2.2.0 Prospect theory

Prospect theory was developed by Kahneman and Tversky in 1979, which focuses on subjective decision-making influenced by the investors' value system. It premised that individuals tend to under-weigh probable outcomes compared with sure ones and people response differently to the similar situation counting on the context of losses or gains within which they are conferred

(Kahneman & Tversky, 1979). Prospect theory describes some states of mind affecting an individual's decision-making processes which include regret aversion, loss aversion and mental accounting (Waweru et al., 2008).

2.2.1 Regret Aversion

Regret is an emotional feeling that occurs after people make mistakes. Investors avoid regret by refusing to sell decreasing shares and willing to sell increasing ones. Moreover, investors tend to be tougher concerning holding losing stocks too long than selling winning ones too soon (Forgel & Berry, 2006; Lehenkari & Perttunen, 2004).

2.2.2 Loss aversion

Refers to the difference level of mental penalty people have from a similar size of loss or gain (Barberis & Huang, 2001).There is proof showing that individuals are more distressed at the prospect of losses than they are happy by equivalent gains (Barberis & Thaler, 2003). Moreover, a loss returning after previous gain is tested less painful than usual whereas a loss coming after prior loss appears to be more painful than usual (Barberis & Huang, 2001). Also, Lehenkari and Perttunen(2004) realize that each positive and negative returns within the past will boost the negative relationship between the selling trend and capital losses of investors, suggesting that investors are loss averse.

2.2.3 Mental accounting

This refers to the process by which people think about and evaluate their financial transactions (Barberis & Huang, 2001). Mental accounting allows investors to organize their portfolio into separate accounts (Barberis & Thaler, 2003; Ritter, 2003). In this research, three elements of prospect dimension: loss aversion, regret aversion, and mental accounting are included in the model, which will be used to measure their impact levels on the investment performance of individual investors at the Nigerian stock market.

2.3.0 Market factors

DeBondt and Thaler (1985) state that financial markets can be affected by investors' behaviours in the way of behavioural finance. If the perspectives of behavioural finance are correct, a number of market forces may influence the investors' decisions and performance. These are as explained below.

2.3.1 Over- or under-reaction to price changes or news

Investors tend to over or under-react to price changes based on the changes in market information and fundamentals of the underlying stock. These changes have high influence on the decision-making behaviour of investors. Empirical evidence revealed that over-reaction (DeBondt & Thaler, 1985) or under-reaction (Lai, 2001) to news might result in different trading strategies by investors and hence influence their investment decisions and subsequent performance.

2.3.2 Extrapolation of past trends into the future

Waweru et al. (2008) conclude that market information has impact on investor's making decision and this makes the investors focus on popular stocks and other attention-seeking events. Moreover, Barber and Odean (2002) emphasize that investors are impacted by events in the stock market that grab their attention, even when they do not know if these events can result good or bad future investment performance.

2.3.3 Lack of attention to fundamentals underlying a stock

Odean (1999) states that investors prefer buying to selling stocks that experience higher price changes during the past two years, as a result they tend to ignore the fundamentals underline the stock. Stock price changes, in this context can

be considered by investors as an attention-seeking occurrence in the market. Also, it has been theorised that investors are impacted by herding effect and tend to move in the same flow with the others when price changes happen (Caparrelli, Arcangelis, and Cassuto, 2004).

2.3.4 Focus on popular stocks and seasonal price cycles

Odean (1999) proposed that individual investors usually sellect the stocks that grab their attention. Besides, the choice of stock also depends on the investors' preferences. Momentum investors might like stocks that have sensible recent performance whereas rational investors tend to sell the past losers. In contrast, behavioural investors prefer selling their past winners to postpone the regret related to a loss that they can meet for their stock trading decisions (Waweru et al., 2008). In general, market factors are not included in behavioural factors because they are external factors influencing investors' behaviours. However, the market factors influence the behavioural investors (as mentioned above) and rational investors in different ways, so it is not adequate if market factors are not listed when considering the behavioural factors impacting the investment decisions and performance. Together with the research of Waweru et al. (2008), this research treats the market factors fairly as behavioural factors that may influence the investment performance of individual investors in the stock market.

2.4 Herding theory

Lakonishok, Shleifer and Vishny (1992) define herding as "buying (selling) simultaneously the same stocks as others buy (sell)" (pg.1). Other definitions refer to herding as the extent to which the group either predominantly buys or predominantly sells the same stock at the same time (Grinblatt, Titman, and Wermers 1995) or identify investors as herding when following each other into (or out of) the same securities over some period of time (Sias 2004). Herding effect in financial market is identified as tendency of investors to follow the others' actions by imitating each other based on the type of stock to buy or sell, volume of stock, selling or buying decisions, and speed of herding.

Therefore determining the active variables and the number of factors they belong to, has become necessary in order for the researcher to validate his measurement model that will be used in the confirmatory factor analysis for the structural model.

3.0 METHODOLOGY

The data collected were analysed by the method of Exploratory Factor Analysis (EFA) through the maximum likelihood approach using SPSS software. EFA is a form of factor analysis that is widely used in examining the structure of a large set of variables to reduce them to a manageable level. Hair, Black, Babin, Anderson, & Tatham (2006), recommends that EFA can be used in selecting items from a large pool (e.g. questionnaire) to group them in a more manageable form, as well as in examining the relationships among the variables to affirm a priori hypotheses. Table1 presents the measurement of the behavioral biases, which were synthesized from the literature. These biases were included in a 38 items structured questionnaire, which was used for data collection. The data collected were analyzed at three different stages that include (1) examining the structural component by extracting the major factors (theories) from the measurement items, (2) examining the validity of the factors extracted to ascertain their uniqueness for developing a measurement model, (3) Testing the structural model based on the hypothesized relationships. This paper captures only the first stage of the data analysis, while the other aspects would also be published as the study progresses.

Table 1: Measurement of behavioural biases prevailing among investors

Dimensions	Questions	Source
Heuristic:	Questions 12 – 13	Tversky and Kahneman, (1974)
• Representativeness	Question14	Oskamp (1982)
• Overconfidence	Questions 15 – 16	Kahneman & Tversky, (1974)
• Anchoring	Question 17	Waweru et al., (2008)
• Gambler's fallacy	Questions 18 – 19	" " "
• Availability bias		
Prospect:		
• Loss Aversion	Questions 20 - 21	Kahneman & Tversky, (1979)
• Regret aversion	Questions 22 - 23	Forgel & Berry, (2006); Lehenkari & Perttunen, (2004)
• Mental accounting	Questions 24 – 25	Barberis & Huang, (2001)
Market:		
• Price changes	Questions 26 – 31	Waweru et al., (2008)
• Market information		
• Past trends of stocks		
• Fundamentals of underlying stocks		
• Customer preference		
• Over-reaction to price change		
Herding:		
• Following the others' trading actions (buying and selling, choice of stock, volume of stock, and speed of herding)	Questions 32 – 35	Lakonishok, Shleifer and Vishny (1992) Waweru et al., (2008)

Source: The researchers

4.0 RESULTS AND DISCUSSION

4.1 Missing data

The missing data analysis revealed that there is no missing value in all the data included in the model. This is so because all the questionnaires returned were checked thoroughly before the data entry process began, and even data entry was done carefully to avoid omission or miss imputing of data into the SPSS software.

4.2 Outliers

The univariate outliers were identified by determining frequency distributions of Z scores of the observed data, as suggested (Kline. 2005). However, no univariate outlier was identified for this study, because a 5-point Likert scale was used. The multivariate outliers were checked by determiningthe Mahalanobis distance (D2), which is a measure of distance in standard deviation units between each observation compared with the mean of all observations (Byrne 2001; Kline, 2005; Hair et al., 2006). A large D2 identifies the case as an extreme value on one or more variables. A very conservative statistical significance test such as $p < 0.001$ isrecommended to be used with D^2 measure (Kline 2005; Hair et al., 2006). In this paper, Mahalanobis distance was measured using SPSS version 16.00, after which it was compared with the critical $\chi 2$ value of 55.5 with corresponding degrees of freedom ($df = 27$), which was equal to the number of independent variables at the probability of $p < 0.001$ (Tabachnick and Fidel 2001). The results of multivariate outliers are shown in Table 2, which shows that there were four cases with D^2 greater than the critical value of 55.5 as mentioned above. Therefore, these cases were excluded from the data and were not included in the subsequent analysis.

Table 2: Mahalanobis distance for multivariate outliers

Observation Number	Mahalanobis Distance D^2
89	64.78
132	62.64
197	59.94
205	57.95

4.3 Exploratory factor analysis (EFA)

Employing the maximum likelihood (MLH) extraction method and obligue model with direct oblimin rotation, exploratory factor analysis was performed with SPSS (version 16.0) to test hypothesis one and ascertain whether behavioural biases among individual investors at the Nigerian stock market are grouped into four major theories as represented by heuristics, prospect, market and herding.

4.4 KMO and Bartlett's test of sphericity.

The Kaiser-Meyer Olkin Measure of Sampling Adequacy (KMO) presents the level of suitability of using EFA for the collected data. The KMO should be between 0.5 and 1.0 (significance level less than 0.005) to make sure that factor analysis is suitable for the data (Ali, Zairi & Mahat, 2006). The result of KMO and Bartlett's Test of Sphericity are presented in Table 3, which shows that the value of KMO measure of sampling adequacy value was 0.853 and the Bartlett's test of sphericity was 4011.942 ($p < .001$), which revealed the appropriateness of sample data for conducting factor analysis.

Table 3: KMO statistics and Bartlett's test of sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.853
Bartlett's Test of Sphericity	Approx. Chi-Square	4011.942
	Sig.	0.000

4.5 Communalities

Communalities between measured items loaded on the EFA model varied from .495 for Q35HERD item to .808 for Q13HEU as presented in table 4. The lowest communality of the Q35HERD item showed that this item was the weakest measured item within the measurement. However, Q17HEU was dropped at the first round of analysis because it has very low communality (.187), which is less than 0.3 minimum requirement for acceptance to proceed into further analysis.

Table 4: Initial and extracted communalities

Items	Initial	Extraction
Q12HEU	.756	.740
Q13HEU	.808	.779
Q14HEU	.757	.743
Q15HEU	.747	.725
Q16HEU	.779	.767
Q18HEU	.725	.645
Q19HEU	.690	.635
Q20PR	.623	.620
Q21PR	.586	.559
Q22PR	.662	.665
Q23PR	.667	.671
Q24PR	.678	.697
Q25PR	.628	.655
Q26MK	.667	.655
Q27MK	.774	.770
Q28MK	.807	.821
Q29MK	.740	.725
Q30MK	.632	.577
Q31MK	.583	.565
Q32HERD	.560	.640
Q33HERD	.559	.595
Q34HERD	.586	.677
Q35HERD	.495	.500
Q36PERF	.649	.726
Q37PERF	.637	.719
Q38PERF	.641	.732

Extraction Method: Maximum Likelihood.

4.6 Total variance explained

Total variance explained is used to identify the number of retained factors in which factors can be retained until the last factor represents a small proportion of the explained variance. The total variance explained is suggested to be more than 50% (Hair et al., 1998). Eigen-value is an attribute of factors, being defined as the amount of variance in all items (variables) explained by a given factor. Eigen-value should be greater than 1 because Eigen-value less than 1 means that information explained by the factor is less than by a singleitem (Leech, Barrett & Morgan, 2005). Kaiser's criterion of Eigen values greater than one and the scree plot were applied for factors' extraction using the maximum likelihood approach. Table 5 presents the results of factors' extracted on the basis of the eigenvalues greater than 1 criterion, which resulted in identification of five factors (4 factors for behavioural biases and 1 factor for investment performance). The result of the five factors revealed a better fit with 73.94% of the total variance explained. The first factor explained 22.2% of the total variance while the other four factors explained the remaining variance in the model.

Table 5: Total variance explained by the five factors extracted

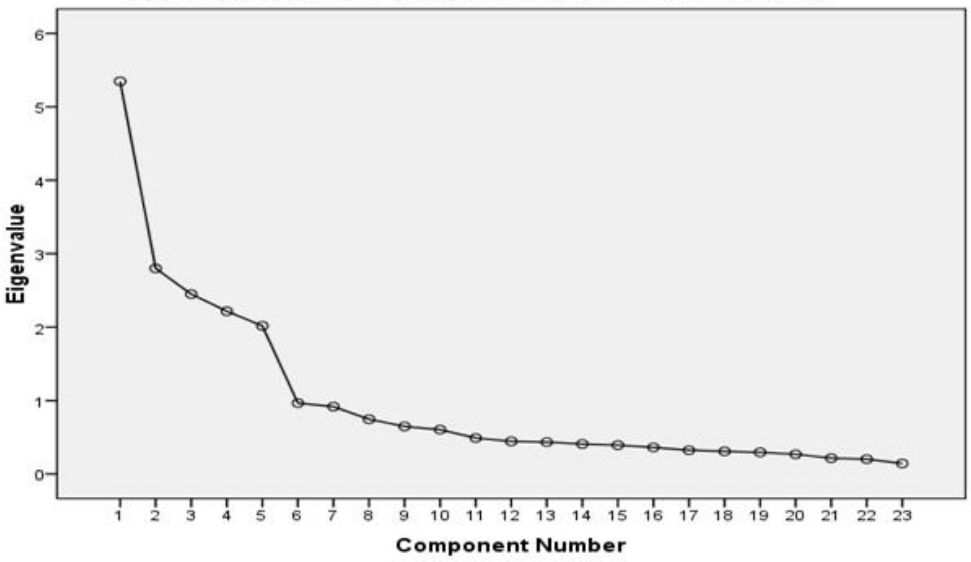
Factor	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	6.102	23.469	23.469	5.779	22.227	22.227	5.179
2	4.495	17.288	40.758	3.993	15.359	37.586	4.421
3	3.771	14.503	55.261	3.606	13.870	51.457	4.017
4	2.576	9.909	65.170	2.105	8.097	59.553	2.420
5	2.281	8.773	73.943	2.121	8.158	67.712	2.675
6	.730	2.809	76.752				
7	.586	2.255	79.007				
8	.491	1.889	80.896				
9	.471	1.812	82.708				
10	.433	1.665	84.373				
11	.394	1.514	85.887				
12	.373	1.433	87.320				
13	.360	1.385	88.705				
14	.347	1.336	90.041				
15	.318	1.223	91.264				
16	.310	1.192	92.457				
17	.292	1.122	93.578				
18	.265	1.019	94.597				
19	.248	.955	95.551				
20	.211	.812	96.364				
21	.207	.798	97.161				
22	.187	.721	97.882				
23	.168	.646	98.528				
24	.154	.593	99.120				
25	.125	.481	99.601				
26	.104	.399	100.000				

Extraction Method: Maximum Likelihood.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Figure 1 below shows the Scree plot test used to confirm the maximum number of factors extracted in the model. The slop of the Scree plot revealed extraction of five factors, which confirmed extraction of the same number of factors through the eigen value criterion.

Figure 5.7: Scree Plot Test for Number of Factor Extracted



4.7 Loadings of measured items on latent factors extracted

The rotated component matrix (Table 6) presents loadings of each measured item on each of the five latent factors identified. It shows that the measured items have high loadings on their hypothesized constructs as all the loadings are greater than .50 minimum required threshold, and there is no cross loading among all the items.

Table 6: Factor structure matrix

	Factor Loadings				
Items	**Heuristics**	**Market**	**Prospect**	**Invest Perf**	**Herding**
Q16HEU	.874				
Q13HEU	.874				
Q14HEU	.860				
Q12HEU	.847				
Q15HEU	.845				
Q18HEU	.791				
Q19HEU	.785				
Q28MK		.901			
Q27MK		.876			
Q29MK		.850			
Q26MK		.809			
Q30MK		.756			
Q31MK		.745			
Q24PR			.832		
Q22PR			.814		
Q23PR			.811		
Q25PR			.806		
Q20PR			.786		
Q21PR			.736		
Q36PERF				.851	
Q38PERF				.851	
Q37PERF				.846	
Q34HERD					.818
Q32HERD					.799
Q33HERD					.759
Q35HERD					.701

Extraction Method: Maximum Likelihood.
Rotation Method: Oblimin with Kaiser Normalization.

4.8 Test of reliability for the factors extracted

Cronbach's alpha test is usually applied to test the internal consistency reliability of measurements, which are in formats of continuous variables (for example, 5-point Likert measurements). It includes a statistical summary that describes the consistency of a specific sample of respondents across a set of questions or variables. In the other words, it can help to estimate the reliability of participants' responses to the measurements (Helms, Henze, Sass & Mifsud, 2006). Cronbach's alpha is usually used in social and behavioural researches as an indicator of reliability (Liu, Wu & Zumbo, 2010). On the basis of the findings of the exploratory factor analysis, five latent factors were created by summing the rating scores of all items loaded on each latent factor/ constructs. The following sub-sections provide the item mean values along with standard deviation and Cronbach's alpha reliability of the measured items.

4.8.1 Heuristics theory construct

The reliability statistics of the heuristics theory construct (Table 7) revealed a Cronbach's alpha reliability of .94 for the seven items obtained during the EFA, which indicates that

the items are highly reliable. The scale mean for this construct showed that the items mean value was 3.80, which confirmed that the heuristics biases are prevalent among the sampled respondents while making their investment decisions. The item total statistics revealed that if any item is deleted the Cronbach's Alpha could not be increased more than the observed Cronbach's Alpha.

Table 7: Item-total statistics of heuristics theory construct

Items	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Squared Multiple Correlation	Cronbach's Alpha for the Construct	Scale Mean for the Construct
Q12HEU	.805	.935	.723		
Q13HEU	.833	.932	.789		
Q14HEU	.826	.933	.739		
Q15HEU	.816	.934	.703	.94	3.80
Q16HEU	.854	.930	.748		
Q18HEU	.776	.937	.689		
Q19HEU	.768	.938	.662		

4.8.2 Market construct

The market construct was created with six measured items derived after the EFA, the reliability statistics of this construct (Table 8) revealed a Cronbach's alpha reliability scale of .927, which strongly indicates that the items under the construct are highly reliable. The scale mean shows a value of 3.77, which also implies that individual investors due consider market variables so important while making their investment decisions. The item total statistics shows that the Cronbach's Alpha for this construct is at the optimal level and cannot be increased even if any item of this construct is deleted.

Table 8: Item-total statistics of market construct

Items	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Squared Multiple Correlation	Cronbach's Alpha for the Construct	Scale mean for the Construct
Q26MK	.757	.917	.619		
Q27MK	.823	.909	.731		
Q28MK	.843	.905	.772	.927	3.77
Q29MK	.832	.907	.720		
Q30MK	.741	.919	.610		
Q31MK	.729	.921	.551		

4.8.3 Prospect theory construct

Table 9 presents the reliability statistics of the prospect theory construct, which comprised six Items. The Cronbach's alpha reliability statistics for this construct shows .912. This also indicates that the items under the construct are highly reliable. The summary item statistics for this constructrevealed the mean value of 3.873, this indicate that theprospect variables have a high prevalence among individual investors while making investment decisions at the Nigerian stock market. The item total statistics revealed that the Cronbach's Alpha for this construct cannot be increased even if any of its items is deleted.

Table 9: Item-total statistics of prospect theory construct

Items	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Squared Multiple Correlation	Cronbach's Alpha for the Construct	Scale mean for the Construct
Q20PR	.755	.896	.600		
Q21PR	.707	.904	.534		
Q22PR	.779	.893	.617	.912	3.873
Q23PR	.752	.897	.625		
Q24PR	.776	.893	.647		
Q25PR	.759	.896	.591		

4.8.4 Herding theory

Table 10 presents the reliability statistics of the herding theory construct, which comprised four Items. The Cronbach's alpha reliability statistics for this construct shows a value of .853, this indicates that the items under the construct are highly reliable. The scale mean also revealed a value of 3.570, which indicate that the herding behaviour has a high prevalence among individual investors while making investment decisions at the Nigerian stock market. The item total statistics revealed that the Cronbach's Alpha for this construct could not be increased even if any of its items is deleted.

Table 10: Item-total statistics of herding construct

Items	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha for the Construct	Scale mean for the Construct
Q32HERD	.711	.519	.805	.853	3.570
Q33HERD	.688	.477	.817		
Q34HERD	.735	.550	.795		
Q35HERD	.647	.419	.832		

5.0 CONCLUSION AND RECOMMENDATIONS

The result of the exploratory factor analysis revealed the extraction of four factors of behavioural biases and one factor of investment performance as shown by the scree plot test, structure matrix, and Eigen value greater than one criterion. The factors extracted explained 73.94% of the total variance of all the measurement items in the model. The reliability test revealed a Cronbach's Alpha greater than 0.7 for each of the constructs and their individual measurement items. We therefore conclude that the behavioural biases that prevail among individual investors at the Nigerian stock market are grouped into four factors as represented by the theories of heuristics, prospect, market and herding, and they could be used to ascertain the influence of behavioural finance theories on individual investors decisions and performance at the Nigerian stock market. The study recommends that these factors (theories) should be subjected to convergent and discriminant validity tests to ascertain their uniqueness, which is paramount in assessing the measurement model to be established.

REFERENCES

1. *Ali, N. A., Zairi, M. & Mahat, F. (2006). Quality HR-TQM Model in Service Context. Staff paper, University of Putra Malaysia.*
2. *Barber, B. & Odean, T. (2002). All that glitters: the effect of attention and news on the buying behavior of individual and institutional investors. Working Paper of the University of California, Berkeley, CA. Retrieved on 15/10/2014 from http://faculty.haas.berkeley.edu/odean/papers%20current%20versions/allthatglitters_rfs_2008.pdf*
3. *Barberis, N., & Thaler, R. (2003). A survey of behavioural finance In Constantinides, G., Harris, M., Stulz, R. (Eds.), Handbook of the Economics of Finance, North-Holland, Amsterdam. Retrieved on 30/12/13 from http://faculty.som.yale.edu/nicholasbarberis/ch18_6.pdf*
4. *Barberis, N., and Huang, M. (2001). Mental Accounting, Loss Aversion, and Individual Stock Returns. The Journal of Finance. 56(4), 1247-1292. Retrieved on 10/01/2014 from http://faculty.som.yale.edu/nicholasbarberis/ma_jnl.pdf*
5. *Byrne, B. M. (2001). Structural equation modelling with AMOS: Basic concepts, applications, and programming, Mahwah, NJ: Erlbaum.*
6. *Caparrelli, F.D., Arcangelis, A.M., & Cassuto, A. (2004). Herding in the Italian stock market: A case of behavioural finance. Journal of Behavioural Finance, 5 (4), 222–230.*
7. *Cognitive Bias – Association for Psychological Science. www.psychologicalscience.org.Retrieved 30/1/2018.*
8. *De Bondt, W. F. M., & Thaler, R. (1985). Does the stock market overreact? The Journal of Finance, 40(3), 793-805.*
9. *Fama, E.F. (1970). Efficient capital markets: A review of theory and empirical work. The Journal of Finance, 25(2), 383-417.*
10. *Fogel, O., & Berry, T. (2006). The disposition effect and individual investor decisions: the roles of regret and counterfactual alternatives. Journal of Behavioural Finance, 7 (2), 107–116.*
11. *Hair J. F. Jr., Black W. C., Babin B. J., Anderson R., E. & Tatham R. L. (2006). Multivariate Data Analysis, 6th ed, Pearson Prentice Hall, Pearson Education, Inc., Upper Saddle River, New Jersey 07458.*
12. *Hair, J. F., Black, B., Babin, B., Andersion, R. E. & Tatham, R. L. (1998). Multivariate data analysis. Prentice-Hall, International, Inc.*
13. *Haselton, M. G.; Nettle, D. & Andrews, P. W. (2005). The evolution of cognitive bias. In D. M.*
14. *Buss (Ed.), The Handbook of Evolutionary Psychology: Hoboken, NJ, US: John Wiley & Sons Inc. pp. 724–746.*
15. *Helms, J. E., Henze K. T., Sass, T. L. & Mifsud, V. A. (2006). Treating Cronbach's Alpha reliability coefficients as data in counselling research. The counselling psychologist, 34 (5), 630 - 660.*
16. *Hirshleifer, D., (2001). Investor psychology and asset pricing. The Journal of Finance, 56(4), 153 –1597.*
17. *Hvide, H. K. (2002). Pragmatic beliefs and overconfidence. Journal of Economic Behavior & Kahneman, D., & Tversky, A. (1974). Judgment under uncertainty: Heuristics and Biases Science, Journal of Finance 85 (4157), 1124-1131.*
18. *Kahneman, D., and Tversky, A. (1979). Prospect theory: an analysis of decision-making under risk, Econometrica, 47 (2), 263–291.*
19. *Kline, R. B. (2005). Principles and practice of structural equation modelling. New York: The Guilford Press.*
20. *Lakonishok, J., Shleifer, A., & Vishny, R. W. (1992). The impact of institutional trading on stock prices. Journal of Financial Economics, 32(1), 23-43.*

21. *Leech, N., Barrett, K. and Morgan G. (2005). SPSS for intermediate statistics: use and interpretation. Lawrence Erlbaum Associates, Inc.*
22. *Lehenkari, M., & Perttunen, J. (2004). Holding onto the losers: finish evidence. The Journal of Behavioural Finance, 5(2), 116–126.*
23. *Lingesiya, K., & Navaneethakrishnan K. (2014). The Influence of behavioural factors in making investment decisions and performance: Study on investors of Colombo stock exchange, Sri Lanka, Asian Journal of Finance & Accounting, 6(1). Retrieve from www.microthink.org/ajf*
24. *Liu, Y., Wu, A. D., & Zumbo, B. D. (2010). The impact of outliers on Cronbach's coefficient Alpha estimate of reliability: Ordinal/rating scale item responses. Educational and Psychological Measurement, 70 (1), 5–21*
25. *Luong, L. P., & Thu Ha D. T., (2011). Behavioural factors influencing individual investors' decision making and performance: A survey at the Ho Chi Minh stock exchange. Umea School of Business.*
26. *Mikołajek-Gocejna, M. (2017). Heuristics psychological aspects of decision-making on capital market. FinanceRynki Finansowe, Ubezpieczenia, 5(89/2), 143–156. DOI: 10.18276/frfu.2017.89/2-11.*
27. *Odean, T. (1999). Do investors trade too much? American Economic Review, 89(5), 1279–1298. Accessed on 20 03/ 2014 from http://faculty.haas.berkeley.edu/odean/ papers%20current%20versions/doinvestors.pdf.*
28. *Oskamp, S. (1982). Overconfidence in case-study judgments. In: D. In Kahneman, P. Slovic and A. Tversky, eds, Judgment Under Uncertainty: Heuristics and biases. Cambridge: Cambridge University Press.*
29. *Ritter, J. R. (2003). Behavioural finance. Pacific-Basin Finance Journal, 11 (4), 429-437.*
30. *Sias, R.W. (2004). Institutional herding. Review of financial studies, 17(1), 165-206.*
31. *Slovic, P. (1972). Psychological study of human judgment: Implications for investment decision-making. The Journal of Finance, 27(4), 779-799.*
32. *Tabachnick, B. & Fidell, L. (2001). Using multivariate statistics", Boston: Allyn and Bacon.*
33. *Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. Science, 185(4157), 1124-1131.*
34. *Thomas, Oliver (2018-01-19). "Two decades of cognitive bias research in entrepreneurship: What do we know and where do we go from here?." Management Review Quarterly. **68** (2): 107–143. doi:10.1007/s11301-018-0135-9. ISSN 2198-1620.*
35. *Waweru, N. M., Munyoki, E., & Uliana, E. (2008). The effects of behavioural factors in investment decision-making: a survey of institutional investors operating at the Nairobi Stock Exchange. International Journal of Business and Emerging Markets, 1 (1), 24-41.*