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**Antecedents of Regret Aversion Bias of Investors in the Stock Market of Pakistan (PSX) along with the Scale Development on Regret Aversion Bias**

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**Keywords:**

*Antecedents,  
Regret-aversion,  
Investors, Stock Market,  
Scale Development*

**ABSTRACT**

*The aim of this study is to explore the causes behind the regret-averse bias of investors in the stock market of Pakistan (PSX) and to develop scale on it to operationalize this study in the future. The regret-averse bias is a state in which people fear that their decisions will turn out to be wrong in the future. The opening section of study consists of semi-structured interviews taken from the professionals of stock market and put on NVivo on their crisp results to get a word-cloud, and check the context and content validity of the customary measure by approving the measure successively the authorization of 5 language and 5 market experts. The second section consists of the floatation of self-developed scale and to: apply Kaiser-Meyer-Olkin (KMO) test to commend the sample-size; apply Bartlett's test of sphericity to check the exactness of the items; check the univariate outliers and apply Exploratory Factor Analysis (EFA) on the results for the drop of over-loading items. The third section consists of the floatation of refined scale with lesser sample size as liken to prior floatation of scale to check the inter-item correlation amongst items so that get more refined scale. The fourth section consists of the floatation of refined scale with lesser sample size as liken to prior floatation of scale to check the reliability (if-item deleted) of factors, association among factors, and cause and effect relationship amongst factors. The last section consists of the floatation of more refined scale with lesser sample size as liken to prior floatation of scale to confirm the factors for scale through Principal Component Analysis (PCA). By exploring and approving the reasons of regret-averse bias of investors in the PSX, the supervisory body of stock market (Security and Exchange Commission of Pakistan - SECP) may control the regret-averse bias of individuals by providing workshops on it, which may lead to proficient stock market and economy as well.*

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**INTRODUCTION**

As per the psychology of many investors, the capital market is a chronicle market of returns. A return in a period of six months will somehow influence the next six month. Similarly, patterns over ten years may be chronically repeated in the coming ten years. Thus, an investor's decision tends to be affected and thus biased, according to chronicle events of the past (Peters, 1989). If a stock has performed well in a given period, an investor is more likely to put his money in the particular profitable stock rather than investing in the one, which poorly performed. Although, it is imperative to note that such decisions are purely based upon bias, as a stock

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performing well in the present day does not guarantee profits in the next.

People invest in shares to gain possibility for capital appreciation. They want money appreciation according to the time allocation or with period of time (Edelen, Marcus, & Tehranian, 2010). In common terms, they prefer to buy for less and sell for more.

Market efficiency has a pivotal role in shaping the behaviors of investors in the markets (Aksoy, Cooil, Groening, Keiningham, & Yalcin, 2008). The stock market is mainly considered as a parameter and direction of the company for a buyer in both negative and positive manner (Conant, 1905) and it directly affects the future standards and growth. A market is called efficient, if there is substantial amount of information flow, resulting in buying and selling of security and commodities (Veronesi, 2000; Zhang, 2006; Hong & Kacperczyk, 2010). But, in developing countries, there is a weak flow of information exists in the market, and there as so many reasons exist behind weak flow of information.

Pakistan has gone through multifaceted problems like poverty, illiteracy, martial laws and poor government structures. However, these problems not only affect the social structure but also the economic structure. With prevailing aforementioned problems, investments tend to shrink as people become biased and apprehensive of satisfying returns (Slavin, 1991). So, market need to be efficient in order to attract large number of investors (Malkiel, 1989).

There is a strong relationship exist among: forecast of stock earnings and investor's as well as analyst's perception (Olsen, 1996; Chan, Chan, Jegadeesh, & Lakonishok, 2001; Eickhoff & Muntermann, 2016; Li & Chen, 2016) and stock's return and investor's earning (Liu & Thomas, 1998).

So, knowing much about macroeconomic conditions of the country may reduce the chances of risk and raise the chances of return (Çakmaklı & van Dijk, 2016), and controlling the emotions at the time of investment decision may increase the chances of success (Edelen, Marcus, & Tehranian, 2010).

Raghubir and Das (1999) revealed various sort of market anomalies, such as: price of the stock and its effect on returns, trading volume of stocks and its effect on volatility, the time-series pattern, and various other irregularities. There are different effects, such as: the day of the week effect, January effect, Turn of the month effect (TOM) and the Ramadan effect. Naturally, keeping these effects in consideration investors will tend to be biased in some parts of the month and year. Prices in Ramadan tend to fluctuate. This can be characterized as known anomalies except to how much it may effect. As soon as Ramadan concludes, buying and selling increase drastically affecting financial markets. Subsequently, studies have shown a positive return, in the month of Ramadan and low vitality due to change in the Muslim investors' behavior.

What can we do to make a proficient stock market condition? How might we solve the problem of volatility in the stock market of Pakistan? The stock market of Pakistan was informationally resourceful during the period of 1964-87 (Nishat & Saghir, 1991), but, after that, the condition of stock market of Pakistan is unstable and changing day by day, as according to Demirgüç-Kunt and Levine (1996) and Khan (2008), less instability in the stock market shows the more stock market progress. Ordinarily, the movements of stocks are based upon the movement of macro-economic variables (mainly political condition) and the investment behavior of individuals in the market. Study conducted by Husain and Mahmood (2001) accomplish that stock market of Pakistan is not the true indicator of economy, as there is a weak relationship among the prices of stocks and investment behavior of individuals. Moreover, Filis (2010) also stated that most of the stock markets in the world are not efficient and they may not depict the true picture of economy. As we can see and observe in the stock market of Pakistan that the behavior of investor is regret-averse bias to investment decisions and the movements of stock market are inconsistent as well. And the major problem on this stage is that investors might truly not know about the causes of regret-averse bias and how they can decrease regret-averse bias. And also, there is very little information available towards the causes behind the regret-averse bias of investor in the stock market of Pakistan. So, one of the substantial elements behind the uneven condition of the stock market is regret-averse bias of investors at the time of decision making. Moreover, it is essential to develop a scale on regret-aversion bias, as majority of investors and experts may know about their level of regret-aversion after giving responses on that scale.

Highly fluctuated stock markets are considered to be undeveloped markets, as high level of deviation in the stocks, is considered to be the problem for the market (Demirgüç-Kunt & Levine, 1996).

Whereas, Baker and Wurgler (2007) discuss that role of human behavior is one of the significant facet behind the unproductive condition of the stock market. But, according to Korniotis and Kumar (2011), there are many other factors that do exist, and an investor also needs to classify those factors in order to get well-organized stock market.

This study would be useful for regular investors, as they may know about their regret-averse bias that exist in their personality at the time of investment decisions in the market.

This study would be greatly favorable for Pakistan's economic condition, as on the basis of this study, the monitoring authorities of Pakistan Stock Exchange, such as: Security and Exchange Commission of Pakistan (SECP) may know about the behavior of investors in the stock market. On the basis of the present study, the monitoring authorities of Pakistan Stock Exchange may develop policies to regulate the regret-averse bias of investors. Moreover, by using this study, SECP can taught the investors to their cogent decision making by arranging workshops.

## LITERATURE REVIEW

Investors usually feel regret in the market when they: missed or ignored any available opportunity (errors of omission) (Whitehead, 1990) because of lack of proper guidelines; unaware or misguided about any existing opportunity (errors of commission) (Berkeley & Humphreys, 1982); improperly analyze the situation (Fischer, Heinle, & Verrecchia, 2015); get framed (Hackbarth, 2009) as based on the concept of Framing Theory (Goffman, 1974); feel unfamiliar with specific choice (Coricelli, Dolan, & Sirigu, 2007; Boeri, Scarpa, & Chorus, 2014); do not achieve what they want or think that their preferences towards particular object may not consistent or feel difficulties in their operations (Lynch & Zauberman, 2007) and such concept of desires may enlightened through Construal Level Theory (Liberman, Trope, & Wakslak, 2007; Trope & Liberman, 2010 & 2011; Moss, 2016) that defines the association among psychosomatic distance and the amount to which people's thinking is abstract or concrete.; feel that information regarding specific entity is not appropriate in the market (Tsiros & Mittal, 2000); select inappropriate option from large number of alternatives (Leland, 1998; García-Herrero & Ortiz, 2005; Chen & Jia, 2012) and when the future results of their selected alternatives may not meet their expected results because of inappropriate selection of alternatives (Syam, Krishnamurthy, & Hess, 2008), such phenomenon regarding the selection of alternatives can be called as Miswanting or such concepts of wrong choice may base on Expectancy Disconfirmation Theory (Oliver, 1980) that explain post-buying pleasure as a function of expectations, supposed performance, and disapproval of beliefs; face problems at the time of experiencing new things (Syam, Krishnamurthy, & Hess, 2008); take decision in case of high uncertainty (Lankton & Luft, 2008); feel or observe high level of insecurity in the near future which may lead towards improbable future planning (Greene & Sullivan, 2015); feel high level of risk in terms immature market environment, like gambling, because of abnormal fluctuations in the market (Johnson & Schkade, 1989); and realize that they fail to allocate extra funds to the achievement of the goal (Kwak & Park, 2012). However, still there is no way to find-out that which sort of regret-averse character an individual have at the time of investment, to deal with that character in an efficient way. Moreover, regret-aversion is an emotional biasness, and Asians are emotional in nature (Norasakkunkit & Kalick, 2002), so there is a strong need to develop a scale based on which certain characters of regret-aversion to be addressed.

### Regret Aversion

Regret aversion is a phenomenon or state of mind in which people hesitate to take any action or make any investment decision in the market, especially in the state of uncertainty in order to avoid the feeling of regret. The theory of regret (Loomes & Sugden, 1982) is an essential theory of judgment (Bell, 1982; Quiggin, 1994; Guthrie, 1999) under improbability and associated with selling for a loss (Barber, Odean, & Zhu, 2009), but people do not constantly make assessments under ambiguous financial rewards (Connolly & Butler, 2002; Zeelenberg & Pieters, 2007). This theory explains the behavioral appropriateness of the investors (Humphrey, 2001). The feeling of regret may most of the time leads to the aggressive behavior (Ariely & Simonson, 2003) and loss-averse behavior of the people (Creyer & Ross, 1999). However, regret is a common and influential feeling that has been revealed to disturb comfort of the investor (Besharov, 2004). In general, this behavior is a form of reference dependent utility (Fehr, Herz, & Wilkening, 2013), because, people usually compare their success with someone other in this state of mind.

Investors tend to make bigger mistakes when valuation uncertainty is higher and stocks are difficult to value (Kumar, 2009).

*H1: Increase in market's uncertainty may lead to increase in investor's regret-aversion.*

Investor can feel regret in both types of environment, either in stable or non-stable (Engelbrecht-Wiggans & Katok, 2007). Such as: in case of selling a product through auction in good environment, he can feel regret because of asking a very low price, while, in case of buying a product through auction in good environment, he can feel regret because of bidding a very high price. In addition to: in case of selling a product through auction in poor environment, he can feel regret because of asking a very high price, while, in case of buying a product through auction in poor environment, he can feel regret because of bidding a very low price.

Though, regret seems to remain even if an individual encounters a favorable outcome (Engelbrecht-Wiggans & Katok, 2008). A winner may start to regret the fact that maybe he paid "too much". While the loser also may feel that he paid "too much" for something he was eventually going to lose. Thus, apparently the more regret is anticipated the more it is salient. Hence, if the loser does not know how much the bidder paid, his regret may be less severe.

Furthermore, if bidders were aware of the amount of regret a loser may feel, their approach would be different, perhaps by setting a different bidding price.

Often individuals deplore a particular investment which they have less information about. Subconsciously, they believe that the particular investment is an uncertain aversion.

In case of presence of regret, an individual's primary aim would be to make a choice based upon utility and least possible regret that may come along with it (Leland, 1998). The amount of payoffs and regret together determine the judgment and eventual decision of an individual.

However, if individuals make choices solely based upon judgments they may end up unambiguously bad (Leland, 1998).

Thus, regret experience is an important factor in determining the outcome feedback and possible future choices. An experience of regret may cause an investor to be prudent in his subsequent choices (Creyer & Ross, 1999).

*H2: Increase in unawareness of and misguidance to investors may lead to increase in investor's regret-aversion.*

*H3: Increase of inappropriate information in the may lead to increase in investor's regret-aversion.*

*H4: Increase in investor's decisions based on framing of mind may lead to increase in investor's regret-aversion.*

## METHODOLOGY

This study used the Mixed Method (Pragmatic Approach). This study is qualitative as there are no earlier studies in terms of the causes of the generation of regret-averse bias of investors in Pakistan Stock Exchange (PSX). This study is quantitative, as it hypothesized the antecedents of regret-averse bias to test and explain that which antecedent is playing a role (strongest - weakest) to the generation of regret-averse bias in the investors of PSX at the time of decision making.

In philosophical context, this study is explanatory in terms of testing the self-developed scale through reliability measures (Cronbach's Alpha) and numerous statistical tools, such as: regression & correlation. Whereas, this quantitative study is confirmatory in nature and is based on the objective approach.

As per the proposals of Schwab (1980) the development of measures classify into three simple phases. Phase 1 is an item establishment while phase 2 is a scale development and phase 3 is about scale evaluation.

For this determination, present study composed data on the basis of primary sources, for which: the study first took *Wide-ranging Interviews* (Polkinghorne, 2005) regarding regret-averse bias of investors from stock market experts and professionals.

After conducting the interviews of experts and professionals in the stock market of Pakistan, the study also verified the results of those interviews on *NVivo* for crystal clear analysis (Richards, 1999; Bazeley & Richards, 2000; Gibbs, 2002; Welsh, 2002) and got 'word clouds' for word frequency (Bringer, Joy, Johnston,

& Brackenridge, 2004; Smith & Firth, 2011; Miles, Huberman, & Saldana, 2013) and selection of *Finest Antecedents* (Bazeley & Jackson, 2013; Henderson & Segal, 2013).

### **Population**

The professionals and experts of stock market were the population for the first phase, whereas, investors of PSX were the population for second phase.

### **Sample**

For the generation of scale on regret-averse bias, the study arranged the meetings with 70-80 experts of PSX, and to approve their replies, the study arranged the informal discussions of multiple investors of PSX. Whereas, to test the generated scale, the study took the replies of investors on various stages of the study.

### **Scale Development, Testing and Evaluation**

According to the mentioned guidelines, the third phase is to develop *Frequency Scales* (Likert, 1932), which supports towards understanding the insight of investors regarding their investment decisions.

Forth phase is to apply the Kaiser-Meyer-Olkin (KMO) test to sanction the sample size. The range of the KMO is 0-1, and  $\geq$  or  $> 0.5$  will consider as adequate (Williams, Onsmann & Brown, 2010).

Fifth phase is to apply Bartlett's test of sphericity to check the correctness of the items, the values of all the items are based on their significance (Dziuban & Shirkey, 1974).

Sixth phase is to check the reliability (if item deleted) of such self-generated regret-aversion scale through pilot testing (Rattray & Jones, 2007) by collecting data of 120-170 investors.

Seventh phase is to analyze the outcomes of such principally collected data (Francis, 1978) through *Descriptive Analysis* (Nida, 1949).

Eighth phase is to analyze the outcomes of an individual based on their collective scores of each element in the scale (Glas & Ellis, 1993).

Ninth phase is to confirm the association among variables by *Exploratory Factor Analysis (EFA)* (Cudeck, 2000; Gorsuch, 1988; Worthington & Whittaker, 2006) through at-least 100-150 responses (Ferguson & Cox, 1993). As according to Guadagnoli and Velicer (1988), a sample size of 150 observations is sufficient to get a particular outcome in *EFA*, providing inter- item correlations are almost strong.

Tenth phase is to check the scores of same single observer recurrent on numerous varied cases over inter-item correlation (BrckaLorenz, Chiang, & Nelson Laird, 2013).

Eleventh phase is to confirm the relationship among regret-averse and their antecedents through *Correlation* (Taylor, 1990), and also check the level of sensitivity of each antecedent towards the generation of regret-averse bias through *Regression* (Seber & Lee, 2012; Watson, 1964; Fox, 1997).

And finally, the study explain and explore too the variables with inter-relations through *Principal Component Analysis (PCA)* in order to remove the case of redundancy (Anthony, 1999).

## **RESULTS AND DISCUSSION**

In the first stage of results, the study converted the responses of experts (brokers) and professionals (investors) into a *Word Cloud* for a deep level of analysis, through the use of NVivo, which is qualitative data software.

According to figure 1, which we get through NVivo based on the responses of market experts, that regret-averse investors exist in the market. Regret aversion cause investors to be too conservative in their investments choices because in the past bad experience in investment makes them to think many times. Due to the conservative approach of Regret-averse investors, they just give proper attention to only specific object as they become narrow minded and may not give proper attention to wide area for investment. The concept of conservatism is described by the Theory of Conservatism (Wilson, 1941) which states that people usually don't want to divert their minds from specific objects. As a result of conservative approach, they just give preferences to the fundamentals of the market and also think that they have very weak decision making power. In addition to it, the market of Pakistan is not based on the fundamentals.

*H5: Increase in investor's decisions based on traditional values may lead to increase in investor's regret-aversion.*

Movement of macroeconomic variable is also playing a very much important role in generating such sort of behavior in investors. In addition to this, major cause of regret aversion is the bearing of loss in the past investment. People are mentally not satisfied from their past experience so they suffer from regret aversion phenomenon. Regret-averse investor is more likely to invest in stock of a good company that involves less risk instead of investing in stock of other company that have same rate of return but have some chances of risk. Regret aversion cause investor to be more precise and conscious in his investment. Regret-averse investors are very much sensitive in nature due to their past bad results, and the concept of Self-Disclosure (Derlaga & Berg, 2013) talks about the human thoughts and feelings based on the past experiences. Past poor results may weaken their confidence level and stuck their approach to specific situations. On the basis of deprived past outcomes, Regret-averse investors feel hesitate to take any sort of decision in an efficient way and become narrow-minded towards their investment. While, on the other hand, positive past results may give them high level of confidence in decision making.

Regret-averse investors usually disappointed and lose their hope for future returns because of the loss in the past investments. And because of disappointment in the past, they don't want to take any investment decision in the future. Regret-averse investors may easily take any investment decision in the future when they get fruitful returns in the past. Regret-averse investors really dislike disappointments in the market. The concept of disliking disappointment may explained by the Theory of Disappointment Aversion (Gul, 1991), according to which, people don't want to enter in an agreement where they feel that they can face disappointment in the future.

*H6: Increase in investor's decisions just based on past results may lead to increase in investor's regret-aversion.*

Regret-averse investors usually lose their confidence in the market. And due to lack of confidence, they think that they are unable to take any investment decision even when market is highly efficient. Whereas, according to the Theory of Overconfidence (Daniel, Hirshleifer, & Subrahmanyam, 1997), people can take decisions even in inefficient market conditions. But, the point of rationality fix between the two.

Because of lack of analyzing abilities, Regret-averse investors usually don't want to examine the alternate options. Regret-averse investors may also not take any decision in tensed environment due to weak analyzing abilities. They think that, without enough market knowledge and experience, they may not analyze the situation in an efficient way. Regret-averse investors with lack of analyzing abilities even don't want to observe the movements and actions of experts in the market as they believe that it is meaningless due to their weak analyzing abilities. Whereas, according to the Theory of Successful Intelligence (Sternberg, 1999), people with efficient analyzing abilities may; achieve their goals of life, identify their strengths, and cover-up their weaknesses, which may leads toward weaken the regret behavior of the investors.

Due to the weak analyzing abilities and lack of confidence, Regret-averse investors can be easily framed by brokers. The concept of Framing Effect (Tversky & Kahneman, 1985) is basically a cognitively biased phenomenon, which is the opposite of Fuzzy-Trace Theory (Reyna & Brainerd, 1995) that is totally based on the rationalities of the people. In the framing effect, investors usually get framed on the basis of efficient presentation of the brokers in the market towards a specific stock, while, as per the concept of fuzzy-trace theory, investors always try to analyze the situation by using their own cognitions.

*H7: Decrease in investor's analyzing abilities may lead to increase in investor's regret-aversion.*

Moreover, by explaining these explored antecedents in detail, the study is achieving one of its objectives, which was to explore the argued antecedents in terms of the investors of PSX.

### **The Questionnaire used in the Survey on the Stock Market of Pakistan**

In the second stage of the results, the study find-out the univariate outliers from the responses in order to separate fair responses and also find-out the overloaded items to get the refined scale. In the third stage of the results, the study find-outs the extremely weak and strong correlation among items from the responses in order to separate normal items. And in the fourth stage of the results, the study checks the reliability of the factors, check correlation among factors, and also perform regression analysis on it. While, all stages done through the use of SPSS, which is a statistical tool for analysis.

According to the results of table 1 of KMO, the selected sample size of all the items are appropriate for this study. Because, the range of KMO is 0 – 1, and the value of = or >0.5 is considered to be appropriate for the study (Williams, Onsman & Brown, 2010).

According to the results of table 2 of Bartlett's, the selected items of all the factors are appropriate for this study. Because, the values of all the items are significant, and the significant values of Bartlett's are considered to be acceptable for the study (Dziuban & Shirkey, 1974).

For this study, 250 feedback forms were floated among the investors of Pakistan Stock Exchange (PSX), which contains 13 variables (Past Results, Lack of Information, Conservatism, Uncertainty, Disappointment, Lack of Analyzing Ability, Lack of Confidence, Framing, Unfamiliarity with Products, Inappropriate Information, Errors of Omission, Errors of Commission, and Regret Aversion), and 48 items, whereas, each variable involves the items ranging from 2-7.

The study got the responses from 153 investors in total, and out of which only 142 feedback forms were completely filled. After putting the responses of 142 feedback forms into SPSS, the study checked the outliers, and found 21 outliers on aggregate basis. The outliers were from Rows 128, 122, 117, 111, 110, 100, 97, 95, 75, 73, 72, 62, 60, 55, 54, 52, 51, 41, 40, 31, and 7.

According to the results of table 3 of Rotated Component Matrix: LAA1, LAA2, LAA3, LAA4, and LC1 are significantly loaded on Factor (component) 1; PR1, PR2, LI3, and LI5 are significantly loaded on Factor (component) 2; UP1, UP2, UP3, II1, and II2 are significantly loaded on Factor (component) 3; EC1, EC2, RA1, and RA2 are significantly loaded on Factor (component) 4; LI6, C3, and C4 are significantly loaded on Factor (component) 5; LC2 and F2 are significantly loaded on Factor (component) 6; U1 and U2 are significantly loaded on Factor (component) 7; no one is loaded on Factor (component) 8; LI1, F4, and EO2 only significantly loaded on Factor (component) 9; RA4 and RA5 are significantly loaded on Factor (component) 10; RA6 is only significantly loaded on Factor (component) 11 which may not generate any variable and stands meaningless; D2 is only significantly loaded on Factor (component) 12 which may also not generate any variable and stands meaningless; and no one is loaded on Factor (component) 12 too.

### **Second Time Floatation of Questionnaire in the Stock Market of Pakistan**

For this study, after performing EFA on it, again, 200 feedback forms were floated among the investors of Pakistan Stock Exchange (PSX), which contains 9 factors (Past Results, Conservatism, Uncertainty, Lack of Analyzing Ability, Framing, Unfamiliarity with Products, Inappropriate Information, Errors of Commission, and Regret Aversion), along with 30 items, whereas, each variable involves the items ranging from 2-5. On this step, I gave new names to each variable again after the detailed analysis of the responses of primarily collected data through interviews of experts and investors in the PSX.

The study got the responses from 112 investors in total, and out of which only 103 feedback forms were completely filled.

#### ***Inter-item correlation***

According to the results of table 4, the study will take LAA1 - LAA4 for variable 1 (Lack of Analyzing Ability) of regret aversion.

According to the results of table 5, the study will take PR1 and PR3 for variable 2 (Past Results) of regret aversion.

According to the results of table 6, the study will take II1, II4, and II5 for variable 3 (Inappropriate Information) of regret aversion.

According to the results of table 7, the study will take EC1 – EC3 for variable 4 (Errors of Commission) of regret aversion.

According to the results of table 8, the study will take C1 and C3 for variable 5 (Conservatism) of regret aversion.

According to the results of table 9, the study will take F1 and F2 for variable 6 (Framing) of regret aversion.

According to the results of table 10, the study will take U1 and U2 for variable 7 (Uncertainty) of regret aversion.

According to the results of table 11, the study will not develop any variable for regret aversion from this data.

According to the results of table 12, the study will take RA1 and RA2 for variable 8 (Regret-aversion) of regret aversion.

### **Third Time Floatation of Questionnaire in the Stock Market of Pakistan**

#### ***Reliability***

For this study, after checking the inter-item correlation among items, again, 150 feedback forms were floated among the investors of Pakistan Stock Exchange (PSX), which contains 8 variables (Past Results, Conservatism, Uncertainty, Lack of Analyzing Ability, Framing, Inappropriate Information, Errors of Commission, and Regret Aversion), and 20 items, whereas, each variable involves the items ranging from 2-4. The study got the responses from 81 investors in total, and out of which only 70 feedback forms were completely filled.

According to the results of table 13 of reliability analysis: U has very weak reliability; LAA has weak reliability; PR, EC, C, F, and RA have good reliability; whereas II has good reliability. The values of all of the variables are acceptable for this study, except U.

#### ***Correlation***

According to the results of table 14 of correlation analysis: PR and U are insignificant with RA; LAA is significant and positively correlated with RA; whereas II, EC, C, and F are highly significant and positively correlated with RA. So, all the variables are acceptable for this study, except PR and U.

#### ***Regression***

According to the results of table 15 of regression analysis, the adjusted R-square is 0.562 which shows 56.2% variation in dependent variables is due to the variation in specifically selected independent variables. But, the basic theme of this study is to develop the scale instead of generalizing it.

Whereas, the value of standard error of estimate is 0.57283 which is close to zero, which means that the over-all data is well-organized, as Standard Error of Estimate less than or equal to 2.5, would be able to produce appropriately fine 95% prediction interval.

According to the results of table 16, the F-stat is significant at 0.000, which shows that the developed model for the testing of *Regret-averse bias* of investors in the stock market of Pakistan is correct.

According to the results of table 17: PR and F are insignificant; LAA is significant with positive beta; II, EC, and C are highly significant with positive beta signs; whereas U is highly significant with negative beta sign. So, all the variables (II, EC, C, & U) except PR and F are acceptable for this study. On the other hand, constant is insignificant, which shows that there is no case of redundancy here.

Whereas, the beta coefficient shows that: variation in 1 unit of LAA may affect the 0.181 units of RA; variation in 1 unit of II may affect the 0.265 units of RA; variation in 1 unit of EC may affect the 0.443 units of RA; variation in 1 unit of C may affect the 0.454 units of RA; and variation in 1 unit of U may affect the 0.319 units of RA.

These results also show that investors become Regret-averse when investors: have lack of analyzing abilities; have inappropriate information regarding market movements; took wrong decision on the basis of wrong advice from experts; and become conservative. But, uncertainty in the market may reduce the risk-averse behavior of the investors, as they think that all people are standing on same level in the market.

#### ***Eigen value***

According to the results of table 18 of Eigen value: the scale on regret aversion bias contains 8 variables (7 independent and 1 dependent), and according to results 7 variables have greater than 1 eigenvalue. So, 7 variables are accepted for the study.



## **Forth Time Flootation of Questionnaire in the Stock Market of Pakistan**

### ***Reliability***

For this study, again, 100 feedback forms were floated among the investors of Pakistan Stock Exchange (PSX), which contains 5 variables (Conservatism, Lack of Analyzing Ability, Inappropriate Information, Errors of Commission, and Regret Aversion), and 14 items, whereas, each variable involves the items ranging from 2-4. The study got the responses from 59 investors in total, and out of which only 50 feedback forms were completely filled.

According to the results of table 19 of reliability analysis: LAA has weak reliability; whereas EC, C, II, and RA have good reliability. The values of all of the variables are acceptable for this study.

### ***Correlation***

According to the results of table 20 of correlation analysis: LAA and C are significant and positively correlated with RA; whereas II and EC are highly significant and positively correlated with RA. So, all the variables are acceptable for this study.

### ***Regression***

According to the results of table 21 of regression analysis, the adjusted R-square is 0.500 which shows 50.0% variation in dependent variables is due to the variation in specifically selected independent variables. But, the basic theme of this study is to develop the scale instead of generalizing it.

Whereas, the value of standard error of estimate is 0.63435 which is close to zero, which means that the over-all data is well-organized, as Standard Error of Estimate less than or equal to 2.5, would be able to produce appropriately fine 95% prediction interval.

According to the results of table 22, the F-stat is significant at 0.000, which shows that the developed model for the testing of *Regret-averse bias* behavior of investors in the stock market of Pakistan is correct.

According to the results of table 23: LAA, II, and C are significant with positive beta signs; whereas EC is highly significant with positive beta sign. So, all the variables (II, EC, C, & LAA) are acceptable for this study. On the other hand, constant is significant, which shows that there is a case of redundancy here.

Whereas, the beta coefficient shows that: variation in 1 unit of LAA may affect the 0.235 units of RA; variation in 1 unit of II may affect the 0.274 units of RA; variation in 1 unit of EC may affect the 0.417 units of RA; and variation in 1 unit of C may affect the 0.217 units of RA.

These results also show that investors become Regret-averse: when investors have lack of analyzing abilities; when investors have inappropriate information regarding market movements; when investors took wrong decision on the basis of wrong advice from experts; and when investors become conservative.

### ***Eigen value***

According to the results of table 24 of Eigen value, the scale on regret aversion bias left 5 variables after the whole process (4 independent and 1 dependent), and according to results 4 variables have greater than 1 eigenvalue. So, 4 variables are accepted for the study.

## **Finally Explored the Antecedents of Emotional Biases of Investors in the Stock Market of Pakistan and their Reasons**

At the end of the whole process for the scale development, the *scale on regret aversion bias* contains 5 factors (Regret Aversion, Lack of Analyzing Ability, Inappropriate Information, Errors of Commission, & Conservatism) along with 14 items, in which, each factor contain items ranging from 2-4.

In general, investors usually feel regret when they may not achieve their desired results. Sometimes, the reason behind most of the failures is lack of analyzing ability.

Lack of analyzing ability is a fundamental factor that plays a pivotal part in the generation of regret-averse bias of investors in the market. Investors with lack of analyzing ability usually don't want to examine alternate options and shows the arrogant behavior, and also don't want to take an action on the basis of expert's actions. The reasons behind the lack of analyzing ability are: lack of market knowledge; lack of market experience; non-habitual behavior in the market; and availability of inappropriate information in the market.

Inappropriate information is another key factor that plays a role in the generation of regret-averse bias of investors in the market. In case of inappropriate information, investors feel uneasy and fear towards investment. And investors think that investment based on unsuitable information may increase the probability of their failure. Most of the time in the market, some over-confident and unprofessional people may give inappropriate information to investors (errors of commission).

An error of Commission is another factor that leads to the generation of regret-averse bias of investors in the market. During error of commission, investors; feel guilty when people misguided about any available opportunity in the market; feel guilty when they invest in any poorly available stock in the market; and most of the time, they feel fear towards their investment decisions. One important reason behind the error of commission is narrow thinking of investors, as most of the investors in the market just try to follow the traditional market values (conservatism), such as fundamentals of the market.

Conservatism is the last-one crucial factor that plays a role in the generation of regret-averse bias of investors in the market. Conservative investors may not broaden their area of investment because of lack of information in the market. And they may not efficiently consider themselves for investment decisions.

### CONCLUSION

According to the results of the study: *H2 is approved*, as increase in unawareness of and misguidance to investors may lead to increase in investor's regret-aversion; *H3 is approved*, as increase of inappropriate information in the may lead to increase in investor's regret-aversion; *H5 is approved*, as increase in investor's decisions based on traditional values may lead to increase in investor's regret-aversion; and *H7 is also approved*, as decrease in investor's analyzing abilities may lead to increase in investor's regret-aversion. Whereas: *H1 is rejected*, as there is no impact of market uncertainty on the regret-aversion bias of investors; *H4 is rejected*, as there is no impact of framing on the regret-aversion bias of investors; and *H6 is also rejected*, as there is no impact of past results of investment on the regret-aversion bias of investors.

From all the independent variables of Regret-aversion (Errors of Commission, Inappropriate Information, Conservatism, & Lack of Analyzing Ability), the most strongest variable that plays a vital role in the generation of regret-averse bias of investor is *Errors of Commission*, in which, investors usually feel fear at the time of taking decision in the market. Secondly, *Inappropriate Information* is playing a role in the generation of regret-averse bias of investors, due to which, investors think that there is a high chances of failure in the market. Thirdly, *Lack of Analyzing Ability* is playing a role in the generation of regret-averse bias of investor, due to which, investors only consider the specific options in the market. And lastly, *Conservatism* is playing a role in the generation of regret-averse bias of investor, due to which, investor stands imperfect in the market.

Moreover, by developing this scale, we may find-out the antecedents behind the regret-averse bias of investors at the time of investment decision in the market. As this scale has been developed after a very much detailed procedure, so, it may strengthening the existing body of knowledge in terms of scale development procedure and characters of regret-averse bias of investors as well.

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