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**Stock Market Efficiency: Behavioral or Traditional Paradigm?**  
*Evidence from Karachi Stock Exchange (KSE) and investor community of Pakistan*

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**Abstract**

Traditional finance explains the investment process on rational and logical grounds based on the assumption of rationality of average investor. This paper attempts to understand why traditional finance models fail to capture stock market movements and how behavioral finance explains that failure in the context of Pakistan's financial market. Beginning with the basics of behavioral finance, the discussion unfolds to explain any association that investor's decision making process has with the behavioral biases like overconfidence, regret, pyramid and risk. Primary data based on questionnaire and interviews of investors trading at Karachi Stock Exchange of Pakistan was used. The study concluded that behavioral traits have significant association with investment decision. The study will also open up the doors to further analyze the deviated scenarios which cause the market to create the loss spiral for one group and unbounded gain for the other.

**JEL Classification:** G02 G10

**Keywords:** Behavioral finance, Regret, Pyramid, Overconfidence

**1. Introduction**

Traditional finance has developed different models to understand the pricing and market behavior and has developed different strategies to justify their very existence in the stock market. It proposes that markets are efficient in a sense that whenever there is a deviation from normality, some abnormal profit making scenarios are developed to capture excess returns, and the ensuing activity then leads to a pricing behavior which eliminates the opportunities for abnormal returns. In traditional finance, investors develop expectations based on the mean-variance optimization or stock valuation based on a firm's financial aspects like sales, dividend, and cash flows. Investors evaluate all these intrinsic measures and then calculate the expected price of a security. This leads to an interesting question: *If all values are derived from the firm's financial indicators, then why do investors act as opposed to that suggested by the model driven results?* Interestingly, traditional finance cannot answer this question since it is the domain of *behavioral finance*. There are certain anomalies or biases responsible for deviations in the market or price behavior. Behavioral finance explores the investors' behavioral aspects and personality traits which render the traditional finance models less accurate and influence their decision making process.

Traditional finance assumes that investors are rational and will keep behaving rationally where risk and return are defined through mean-variance analysis. But it is also important to understand how and why investors behave irrationally when they are faced with various psychological challenges. While analyzing the investment, an average investor might not know the meaning of standard deviation as a risk measure. Rather, he may be involved in cost-benefit analysis doing trial and error activity, based on his past investment experience. This is the investor's confidence which does not lead to calculated and logical investment decisions. Such decisions reflect the investors' tendency to meet their investment objectives in the easiest way possible. The following discussion explores how behavioral aspects affect the investors' decision making process in terms of holding or quitting the position in an investment.

Traditional finance entails many assumptions which raise serious doubts regarding the market efficiency concept. These include frictionless access to information, similar time horizon for investment, and identical risk-return expectations. It is also assumed that all investors are rational in the investment approach which has its own shortcomings in a sense that investors have different tastes, emotions, feelings and subjective assessment of investments; truly putting them in an irrationality zone. The stock market efficiency is based on fundamental analysis where it is assumed that fundamentals of the firm justify the stock prices and as fundamentals change, the stock prices re-adjust immediately to capture the change. Another important aspect of traditional finance is that the announcement of any firm specific news (whether good or bad) gets reflected in the stock prices instantly. On one hand, the market movements are sometimes backed by financial performance measures of the firm and ensuing announcements while on the other hand, situation may be different in a few other cases and factors like investors' difference of opinion and judgment regarding the reliability of information might render the traditional finance and market efficiency concept a debatable issue. The behavioral element in the investor's decision making process has motivated researchers to assess and evaluate the scenarios to understand how investors invest, what motivates them to trade and what is their post investment sentiment regarding the investment. This field is gaining immense popularity among practitioners as they are now increasingly becoming aware of the behavioral shortcomings inherent in the traditional finance techniques. The amalgamation of these two approaches to understanding market behavior will eventually lead to higher levels of market efficiency.

Financial world has witnessed many crises over the past three decades where investors, portfolio managers and risk managers had developed financial models to select and de-select the investments. These models were structured with pure quantitative techniques with assumptions that certain things will hold constant. But outcome was a bit different. Financial analysts overlook the hidden factors like personality traits (investor's aptitude, tastes, sentiments) and blame the models when something goes terribly wrong. In reality, these factors influence the investor's final decision to buy or sell. This study will help practitioners, investors, portfolio managers in incorporating the behavioral aspects in investment strategies to better capture the entry or exit points for an investment. It will also help financial analysts capture the investors' psychological patterns while developing financial models. Portfolio managers will be able to go for psychological profiling of the investors to better understand their general tendency.

## **2. Literature Review**

Biais et al. (2000) concluded that there is a link between psychological factors and subjective behavior which shows that investors ignore all the basics of traditional finance and get trapped by the psychological dilemma which may force them to over or under react in some situations. Based on these subjective criteria, they may begin trading more heavily which does not make sense at that point in time and ultimately leads to low investment performance and earnings when transaction and other costs are accounted for. They may also wrongly predict the market movements and thus may incur losses as a result while attributing this activity to others who did not follow the same forecasting criteria. Shefrin and Thaler (1988) explained one of the psychological tendencies which investors develop over a period of time as they become more experienced. He concluded that investors become over confident based on their past successful experiences in stock investments and start thinking that they know more than the average investor in the market. So, they feel confident with their prediction capabilities and often deviate from the models' predictions which might have predicted contrary to what they think. This results in more trading and heavy investment in some areas, thus further fueling the occurrence of bad results. They also highlighted the fact that investors often misjudge the risk associated with investing in a certain stock. They identified a situation where investors create a certain benchmark based on their past investment experience and then start comparing results with that benchmark even if the new information enters the market. They stick to their own benchmark and do not react to the information which makes their portfolio less diversified. Owing to this tendency, they get involved in a situation where they start thinking in terms of *What-If* parameters. This results in investments based on certain past behavior which may have changed over a period of time. Shiller (2004) also maintained that psychological and sociological factors do impact the investors' decision making process as every investor holds varying investment objectives and heterogeneous expectations. Traditional finance assumes that all investors have homogeneous expectations regarding return, risk and covariance of stocks. Based on this factor, investors typically do not move in tandem and start creating their own expectations, thus making the financial models less accurate which lead to market inefficiency. They also highlighted that every investor does not have the same access to information which may distort the

investment pattern and may result in deviation from efficiency. Further, they also emphasized the context in which investors receive information.

Ricciardi and Simon (2000) concluded that behavioral finance encompasses almost every field ranging from psychology to mathematics where it focuses on the logical reasoning patterns of investors and deals with their judgments, emotions, sentiments and the degree of influence over the investment decision making process. It also covers the attitude of investors in different contexts where they behave differently based on the time horizon of investments. Barber and Odean (2000) argued that investors make mistakes while investing money and others benefit from their mistakes by the time they realize their errors. Wood (1995) elaborated the idea that investors do not behave like financial models do. Investors do not follow the concept of equilibrium but follow the fear and hope syndrome which makes them keep changing their positions without considering the equilibrium point which financial model has predicted. So, prices become irrational sometimes and efficiency often appears to be a textbook trick.

Goetzmann and Peles (1993) concluded that underperforming investments trigger a sense of guilt, regret, and embarrassment in investors which forces them to hold on to them so they can take a face saving refuge by not letting their acquaintances know about the wrong investment decisions they made. People sometimes invest in the hottest stocks of the week which a large number of investors buy. If something goes wrong as a result, investors find it easier to justify their wrong decisions by associating themselves with the losers, suggesting that it happened to every investor. Canner, Mankiw and Weil (1997) noted that financial advisors recommend portfolio construction through aggregation perspective where correlation plays important role to diversify risk but investors plan their investments with a ladder system creating a pyramid where they try to minimize the downside risk by investing in the least risky assets so as to meet those objectives which are crucial for their survival. They focus on the upside potential afterwards for which they are willing to bear more risk because they know that they are now over the subsistence zone. In this laddered system, correlation is often overlooked and investors purely follow the rule of bifurcation or segregation to meet their investment objectives.

Lopes (1987) explained that a person who is risk-averse always talks about downside protection while a risk lover keeps venturing in search of potential to get rich. A person with an objective to buy a house might not match the other investor's objective to buy a car. Shefrin and Statman (2000) argued that a person may be more interested to buy a company's stock with which he is more familiar or the company with which he has some association. Investors tend to buy domestic stocks more often even if foreign stocks are a much better investment because they know more about domestic companies as compared to foreign firms. Investors avoid foreign stocks because of the differences in culture and language and lack of familiarity with the company. He has also concluded that investor's activity dominated by their personality and behavioral aspects results acute and chronic inefficiency in the market making rooms for few investors to tap the opportunity by doing that which rest of the players are not doing. He also added that most of the time investors' behavior depends on their sentiments when it comes to rebalancing the positions. This judgmental flexibility of rebalancing makes their stocks performances go astray when market is not moving in tandem. Investors use the judgmental approach looking at their investment of stocks which stock has produced results as per the expectations. Friedman and Savage (1948) explained how investors use insurance and lottery tickets to protect themselves from downside risk. He concluded that investors have a tendency to move in layer or ladder system i.e., to protect their financial stability by maintaining the subsistence level in the first place and finally to become rich. Bell (1982) described investor's way of justifying their feelings or emotions if outcome of stock investment is not as per the target which they have created through trial and error or stereotypes over a period of time. Based on this anchoring behavior, investors have the tendency not to revise the forecasts which they have earlier created. This anchoring puts them in a feeling where they do not sell a certain stock which has declined in value, justifying that colleagues will curse him for making a bad choice or investment. On the other hand, investors have a tendency to quit from a position immediately to protect them from losses. Shefrin (2002) pointed out that investors' wealth has an impact on the approach they have towards the investment. If an investor has generated wealth in a passive way he will have a conservative approach towards stock investment while a person with a sudden windfall of wealth will behave in a different way depending on the level of wealth he generated all of a sudden. He concluded that willingness of investors change as the level of wealth changes making investors truly trapped in behavioral dilemma where they keep doing analysis from their situational profile and not realizing the actual information and behavior of the market which will lead market towards inefficiency. Shefrin (2002) identified a personality trait of the investors where they have the pattern of

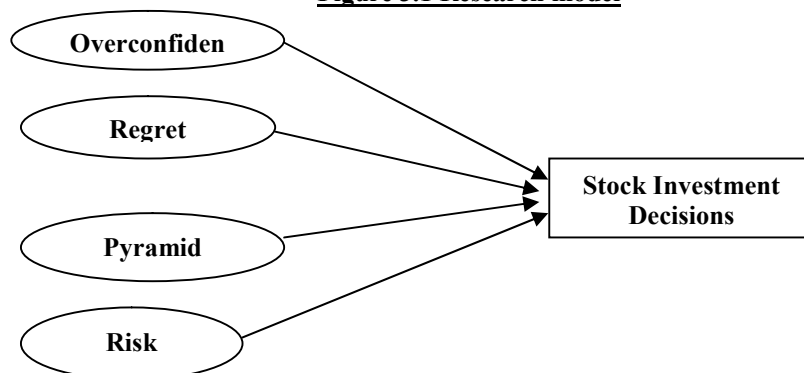
changing the opinion or views based on the movement of the stock market either up or down. He described this pattern as a way of framing the situation of the market and then adjusting the risk tolerance level. If market is constant or flat and moving downward, this makes the investors reluctant to enter the market and adopting loss aversion strategy. When the market becomes bullish, investors become optimistic and invest more with the hope of getting more returns but they may suffer losses as prices decline. This phenomenon has its own repercussions as overvalued winners who think they have earned high return actually underperform and undervalued losers in the end will outperform when prices adjust to intrinsic values. He also explained an important bias in investors' stock investment decisions that investors have a thinking process where they ask someone who they feel could have better idea and expertise in stock investment thus this endorsement has profound impact on the thinking process of the investors if the recommended investment gives positive results making the investors hooked to this illusionary behavior. Investors do not analyze their positive earnings and only investigate when they suffer losses in their investment.

Lo (2005) suggested an adaptive market hypothesis where he has given improved version of EMH trying to add value to the irrationality of the market because of the biases of the investors depending on the situations and reacting to those where markets become irrational. In this new framework, he has suggested that both financial and behavioral models can co-exist in a persistent manner leading to surprising results where markets can be observed behaving rationally. He has suggested that in adaptive market hypothesis individuals have a tendency to move for their own interest ignoring what is happening outside their own parameters. Another factor highlighted is that investors are prone to make errors in their investment decision and they have the attitude to learn and then adapt over a period of time. In this process of trial and error, investors create their own benchmark but this time more aligned with the market behavior as well. Finally he has the view that ultimately evolutionary process will set the market dynamics depending on the size of the investors, frequency of trading and pattern of losses over a period of time. Ritter (2002) has explained behavioral finance as a field in which investors are involved ignoring or deleting the base level assumptions of traditional finance of expected utility maximization phenomenon where investors react rationally in markets which are efficient in nature. He has added further that there are two main streams which pull up the essence of this field what investors think when market is not behaving efficiently. Investors have a tendency to create beliefs which are sometimes misjudged or because of the preferences making the entire process of investment move in opposite to what is required at that time. He also explained the investor's behavior towards inflation that investors always go for high nominal returns without focusing the current level of inflation as high returns motivate them to invest. On a rational basis, if inflation is low, returns expectations should be low but investors based on their belief that inflation is still going to kill their purchasing power which is a wrong belief at that point in time but keep searching and demanding high return start making investments which ultimately lead them to lose their wealth as well.

### 3. Research Model

Stock investment has been a debatable issue over many decades where it was initially based on the idea that firm's fundamentals help in the pricing of stocks and investors focus on sales, cash flows and other parameters to forecast or predict stock price. But investors do not always follow a quantitative methodology to decide about entry or exit decisions about stock investment. Investors exhibit different behaviors based on subjective information processing to move into or out of the stock investment. Theoretically, these personality traits have a major impact on the investors' decision making process in such a way that sometimes familiar trends based on their past experiences make them feel confident about any stock price movement. This trait leads to miscalculated decisions. In this study, four variables have been identified as having an impact on the stock investment decisions. Stock investment decision is dependent variable and overconfidence, regret, pyramids and risk are independent variables.

**Figure 3.1 Research model**



#### **4. Data and Methodology**

Reliability of the scales is measured through Cronbach's alpha and its acceptable benchmark is considered to be .6. Its value in this study is .571 which is close to the benchmark. The validity of the scales was assessed by the practitioners and experts involved in stock investment at Karachi Stock Exchange (KSE). The study was conducted on 180 respondents where 129 (71%) are male and 51 (29%) are female. 86% of the respondents are in the age bracket of 21-50 years. 70% of the respondents are married and 30% are single. 60% of the respondents have Master degree and 31% have graduate degree and 9% have intermediate level of education.

#### **5. Results**

Stock investment and three variables (overconfidence, regret and pyramid) have significant correlation which shows that they have a degree of association among each other. Correlation values in most of the cases are low but positive. The value of R-Square is .14, suggesting that independent variables explain 14% of variation in the dependent variable. On an adjusted R-Square basis, it moves down to .121. The low values of R-Square suggest that there may be variables other than those under study having greater explanatory power and as all investors have different personality attributes which often impact the investment decisions. This will require identification of more variables which can account for greater variation in the dependent variable. F-test shows the overall significance of the model where all variables have significant relationship with the dependent variable. F-test is significant at 5% significance level with F-test value of 7.149 with a p-value of .000. The regression model suggests that overconfidence and pyramid are significant at 5% significance level. This shows that these two variables have a cause and effect relationship with the stock investment decision. Though beta coefficients values are low (overconfidence .176 and pyramid .178) showing that these have low relationship but from a behavioral perspective, these traits can vary and identification of a variable with high beta coefficient requires further analysis for more important variables which can have impact on stock investment decision. Regret and risk beta coefficients are insignificant at 5% significance level suggesting that they have no cause and effect relationship on stock investment decision. The model suggests that overconfidence do have an impact on the stock investment decision, based on this overconfidence personality attribute investors often start buying and selling stocks which may be against the current market behavior. This over buying and selling also have an impact from the portfolio's perspective where investors shift their investment focus towards a few stocks which further add risk to their portfolio. Another factor which adds fuel to the losses is that this behavioral trait leads to high transaction costs which make investors earn less after accounting for these costs. Pyramid beta coefficient suggests that investors follow a layer by layer approach in investment where they invest keeping certain goals so as to meet the cash flows to meet most urgent requirements.

Investors with the age of 21 to 30 years of age have only overconfidence significant at 5% level. Investors with the age of 31 to 40 have regret and pyramid significant at 5% level. Investors with the age of 41 to 50 years have overconfidence and risk significant at 5% level. Investors with the age of 51 and above have overconfidence significant at 5% level. As the investor ages, it adds a bit to his confidence level making investor feel that he has abilities compared to others to make or pick investments which will perform well compared to the market. Investors with the experience of 6 to 10 years have overconfidence significant at 5% level. Investors with experience of stock investment also give an impression that over a period of time they have learnt how to go for good investment. This illusion leads investors in a fallacy that investors create a kind of cloud which makes their stock investment process trapped by personality trait while ignoring other factors which may have more profound effect on the stock investment. Male investors have overconfidence significant at 5% level. Female investors have insignificant overconfidence and Risk while Regret and Pyramid are significant at 5% level. Male investors have a tendency to get trapped by overconfidence as they feel they have more analytical skills, judgmental and hindsight skills to better able to predict and select investment which will performed as per their expectations.

**Table 4.1 Research sample distribution**

<b>Age (years)</b>	<b>Frequency</b>	<b>%</b>	<b>Education</b>	<b>Frequency</b>	<b>%</b>	<b>Gender</b>	<b>Frequency</b>	<b>%</b>	<b>Marital Status</b>	<b>Frequency</b>	<b>%</b>
Less than 20	12	6.7	Intermediate	17	9.4	Male	129	71.7	Single	55	30.6
21-30	73	40.6	Graduate	54	30.0	Female	51	28.3	Married	125	69.4
31-40	53	29.4	Masters	109	60.6						
41-50	29	16.1									
More than 50	13	7.2									
Total	180	100.0		180	100.0		180	100.0		180	100.0

*Note: Respondents are categorized to further analyze the behavior under different personality conditions.*

**Table 4.2 Correlation results**

	Avg. over confidence	Avg. regret	Avg. pyramid	Avg. risk
Investment Stock	0.280**	0.171*	0.242**	0.146

Note: \*\* and \* Indicate Pearson's correlation is significant at 1% and 5% level respectively (2-tailed).

**Table 5.1 Category wise regression results**

Category	Statistic					
<b>Total Sample</b>		<i>Overall Sample</i>				
	Avg. Over confidence	.176***				
	Avg. Regret	0.094				
	Avg. Pyramid	.178***				
	Avg. Risk	0.047				
	R-Square	0.14				
	F-test	7.149***				
<b>Gender</b>		<i>Male</i>		<i>Female</i>		
	Avg. Over confidence	.225***		0.057		
	Avg. Regret	-0.031		.396***		
	Avg. Pyramid	0.103		.312***		
	Avg. Risk	0.07		0.078		
	R-Square	0.077		0.279		
	F-test	3.665***		5.835***		
<b>Marital Status</b>		<i>Single</i>		<i>Married</i>		
	Avg. Over confidence	0.159		.190**		
	Avg. Regret	0.133		0.079		
	Avg. Pyramid	.201**		.181**		
	Avg. Risk	.222**		-0.41		
	R-square	0.205		0.094		
	F-test	4.486***		4.234***		
<b>Education</b>		<i>Intermediate</i>		<i>Graduate</i>		<i>Master</i>
	Avg. Over confidence	.551*		-0.071		.212**
	Avg. Regret	.338**		.124**		0.107
	Avg. Pyramid	.693*		0.033		0.16
	Avg. Risk	0.113		-0.087		0.121
	R-square	0.747		0.025		0.171
	F-test	12.819*		1.334		6.570*
<b>Age</b>		<i>Less than 20</i>		<i>21-30</i>		<i>31-40</i>
	Avg. Over confidence	-0.31		.256**		.439***
	Avg. Regret	0.57		-0.155		.322**
	Avg. Pyramid	.787*		0.060		.222**
	Avg. Risk	0.302		-0.111		0.119
	R-square	0.555		0.121		0.189
	F-test	2.181		2.342*		2.790**
<b>Experience</b>		<i>Less than 5</i>		<i>6-10</i>		<i>11-15</i>
	Avg. Over confidence	0.12		.428***		.200*
	Avg. Regret	-0.17		0.096		.257*
	Avg. Pyramid	.242*		0.13		0.164
	Avg. Risk	0.059		-0.15		0.211
	R-square	0.036		0.207		0.211
	F-test	1.338		5.379***		3.406**
				<i>16-20</i>	<i>More than 20</i>	
				8.497***	6.407**	

Note: \*, \*\* and \*\*\* indicates that a Two-sided t-test is able to reject the hypothesis that co-efficient is equal to zero at 10%, 5% and 1% level of significance respectively.

\*, \*\* and \*\*\* for F-test indicates that test is able to reject the hypothesis that all co-efficient are equal to zero at 10%, 5% and 1% level of significance respectively.



Based on this personality trap they start moving in the domain where they frequently trade (buy and sell) without realizing that in the end they will earn less returns and if this do not move as per their own created process, they end up with huge losses. On the other hand, female investors are less overconfident in making bets on stock moves but on a return basis they remain on the positive side on an overall return basis and see less volatile behavior in their realized returns over a period of time. Investors with Single marital status have pyramid and risk significant at 5% level. Married Investors have overconfidence and pyramid significant at 5% level. Both single and married stock investors follow the pyramid approach in their stock investment process as both are concerned first to meet basic requirements or needs before they jump to the next layer for more risky investment. Married stock investors have significant overconfidence behavior as they feel that they have got skills, more mature thinking and have seen world with its true color making them react sometimes differently in different situation as they have their own approach to look at stock investment process.

Investors with intermediate level of education have overconfidence significant at 5% level. Investors with graduate level of education have regret beta coefficient which is significant. Investors with Master level of education have overconfidence and pyramid significant at 5% level. Investors with high education coupled with experience make them think from their own parameters giving themselves impression of knowing more than the others where they feel they can make more informed and calculated decisions which may impact the stock buying and selling behavior in their own way which may make market movement inefficient. They feel they have better idea how to interpret the information and create the forecast which others may be lacking. This trait of ascribing all good things to them (Self-Credit) sometimes lead them in a trap where they sell when market says buying behavior ultimately ending up with losses and inefficiency to the market.

#### **6. Interview and Focus Group Analysis**

Majority of the respondents have opinion on market erratic behavior over past one year where volumes are low, market is shaky now a days with low returns but quite volatile behavior. Last year performance is relatively better as market recovered out of the crisis where market showed much improvement to volumes and returns gave confidence to investor's about the performance of the market. Three years performance witnessed with bad feelings and plenty of regret on the investment activities where investors lost most of their wealth. Ten year performance was best of its kind in the region where market touched the all time high built up the investor's confidence in stock market activity. Investors also attributed this performance to stable Rupee-Dollar value over the period. Investors have a tendency to recall good events most of the time but low re-call ability about bad events. Even if they are able to recall the bad performance period, recall ability about severity of losses is low because once the market start recovering and investors are able to make profits in future, they have the tendency to forget the severity of losses. In 2008, investors lost a lot of money, some even went bankrupt and few committed suicide, this severity of events, investors forgot as time passes and put less emphasis on those bad years. Investors have the behavior to focus on the recent phenomenon rather than old patterns. Investors are trapped by recent activity as they put more weight on recent outperformers than underperformers. This regency effect is common among investors. Majority of the investors intend to hold stock for longer period of time. Majority of the investors said that they buy stocks to make money out of this investment but also showed a gambling behavior where they most of the time go for short term gain trapped by their judgment that market will go down. Majority was interested to hold long term but impatience makes them quit the position because they try to limit the downside which shows investors do not follow always what they say. Most of the investors rated stock investment as making bets on the stock based on their expertise and keep watching the screen direction. When investors change investment horizon based on any bad or good event they also make the overall performance of their investment portfolio to deviate what they have predicted.

Based on the recency effect, because market is volatile with political unrest and other factors, investors have mixed view about return expectations. This behavior is because when their invested stock does not perform they try to spread the belief that in future market will not perform good. Investors create their expectations most of the time based on what they have heard in the street and what their market intelligence is suggesting show that investors follow the information sharing and then creating views about the return expectations. When stock does not perform as per the expectations, analysis points out that majority of the investors have the aptitude to react impatiently by getting out of the positions without realizing that this movement may be temporary as they initially responded that market is volatile where things can go back and forth. Investors react most of the time against themselves giving justification that by reversing position

this will help to limit downside but effectively they lose more than what they feel. Investors keep on adjusting based on the stock movement until where they feel the desired position has been achieved. If in this activity, transaction cost and taxes are included, this will further put downside pressure on their returns, but investors feel that they have fared a better deal. Investors have the trait to react quickly on any bad event feeling that it's better to quick then to wait and watch the true market behavior. This impatient reaction leads them sell the profitable position further reducing their return over a period of time. When buying stocks, investors focus on the fundamentals of the company's management and past announcements. Few focuses on the value part (Dividend yield) and few focuses on the appreciation part (Capital gain) but they keep shifting from one domain to another based on the needs and requirements of the investors or expectations of the stock. This shift in approach comes from the personality differences where investors react based on the results which makes the stock to react in the market differently as well. Each attribute requires a different investment approach and selection methodology which investors ignore at the time of buying the stock. To this end, investors move in random behavior making things go against them because they follow what their judgment recommended at the time of investment. Almost all investors responded that when they are more familiar with the company, it puts them in the comfort zone and motivation to invest with strong expectations that investment will behave as they expected. They also attributed this trait as one of the most important factor for stock investment. This personality trait puts the investors in the danger zone as all they are betting is the knowledge about the company without any regard to actual performance of the company. Investors are more reluctant to invest in foreign company's investment because of the lack of knowledge about overall operations of the firm; cultural differences showing investor have the attribute to become domestic bias making their wealth concentrated in few areas. Interview response analysis relates that majority of the investors responded that they go for fundamental and technical analysis to price the stock like divided discount model, free cash flow to equity model, price multiples etc. However, investors have their own way to value stocks based on different parameters as they do not do what they say. Investors do focus on co's management, performance, corporate practices but also use the subjective process as every investor gives different weights to different parameters based on what they have experience in the past with that stock or stock of the same nature. Investor's sentimental involvement with the stock also has impact as investors become biased while creating reasoning process where these behavioral traits get more weight purely deviating from modeling approach. Even when investors purely focus on the models of traditional finance, behavioral traits do impact in model development as investors based on their confidence level and ability to read the future trend tilt the model in certain direction where results or outcomes are more aligned what the investors planned making the model itself biased.

Investors treat the news about firm and firm's performance alike while actually these two attributes are different as both have different perspectives from stock investment activity. Investors sometimes try to align these two attributes to what they have predicted and become biased in their investment. Investors no doubt have financial modeling or analysis part in their stock picking activity but when things deviate and when models do not work as they predicted, they start using their judgment or trap by personality traits. Finally they feel that it's the judgment or gut feelings which are the bottom line in stock investment. As long as stock moving as per their model result, they feel good and relate all this success to their abilities of developing financial model which gave superior returns but when things move against they start using their judgment and blaming others variables which did not work. Investors have their own way to interpret the information as few investors they treat a piece of information as rumor while others treat that information as the single most factor to go for or quit out of any investment. This difference in interpretation is very logical as investors have different background, experience of gains or losses, educational background, level of investment and most important the time horizon of the investment. Investors react to news from their own frame of mind where they have created different rules of thumb or benchmark for any move in the market. When certain things match the benchmark, they start following the market and when deviation comes they start making the situation from worse to worst. Response Analysis concludes that Investors get more trapped on the downside by behavioral traits as most of the investors feel frustrated or depressed when stock's price moves down. They react to this event by doing what is not suggested as majority of the investors said they have long investment horizon. In order to remove this frustration, they start selling because of the feelings of regret which make them justify that this is the best option to stay close to the shore. Analysis suggests that majority of the investors have no proper idea about portfolio construction as they follow the judgment in stock picking activity. Further analysis shows that they follow the Herd, they follow the Crowd. They start picking stocks which others are buying giving justification that others must be

true or if someone who has performed well in the recent time, investors follow that investor making themselves followers by not taking much deviation from the norm. Investors do not have proper set up to construct portfolio even they responded they follow financial models to pick investment. Analysis shows that Almost all investors have this behavioral trait that the more experience they get, the more calculated they are in their stock picking exercise. This attribute makes the investors become overconfident in their abilities and gives illusion about stock investment and performance over a period of time. Investors based on their experience and witnessing both good and bad performances create the impression that they have developed expertise or strategies to outperform the market. This behavioral aspect makes them biased in their decision to tilt the investment concentrated in few areas which lead them to losses when expectations do not meet their judgment. Investors when faced with this phenomenon still trapped by behavioral part start giving justification that stock will perform when all other variables start working. It means investors do not bear the blame of something happening against them and curse the market while when things are going well, they take the credit for their judgmental and expertise. When asked about their self rating and overall performance of their stock portfolio, majority of the investors rated themselves among the top performers and on an overall basis portfolio performed well above the market. This self attributing behavior also shows that investors over rate themselves even when they have lost major portion of their investment. During the past 10 years period, market witnessed number of downturn where investors got frustrated and planned to not to enter again in this bubble activity. But based on the responses, investors rated overall performance well in the top category, and that too attributing their own strategies based on judgment, sentiments and attitudes about the market. Few investors have tendency to ascribe this superior ability to the education level or related activities which put them apart from rest of the players, giving themselves an edge of having someone with unique skills to pick investment which will perform as they have predicted. This over-reliance on self behavior clearly moves their portfolio tilt towards few avenues where portfolio underperforms compared to the market.

Market not performing as per expectations has more profound psychological impact on investor's behavior as compared to stock not performing as per expectations. When market is moving against the expectations, investors get more frustrated and feeling of regret becomes more prevalent where investors start reacting opposite to what financial models have predicted. This behavioral trapping makes investors lose faith on financial modeling and firm's fundamentals and start doing whatever their judgment and current scenarios recommend them to take the decision. Investor's reaction to this activity makes the market become more inefficient even current information is available to the investors. Majority of the investors ignore the updated information which will make stock market move towards inefficiency blaming that market efficiency is just a trick which trapped them. Investors still prefer to use the If-that rule of thumb that if market has gone down x percent, that will give loss of y percent. This judgmental accounting makes the market never reach to efficiency which traditional finance has recommended. When market is moving down, investors have the tendency to spread more pessimistic view making market behavior more volatile. When market is going up more what they have predicted they treat this as a shallow behavior, so they do not follow what the market is suggesting and move as per their own benchmarks which they created over a period of time based on the market up and down trend. All investors responded positively that behavioral traits impact the stock investment as all investors have different expectations from the investment based on different investment horizon. As all investors have their own way of selecting and de-selecting process of stock investment where investors focus on their own jubilation and regret paradigm impacting their stock investment return. All investors enter the stock market with different expectations like dividend yield or capital gain also creates the difference in investor's need based behavior. Personality differences coupled with period of good or bad performances also create a spiral for investors to keep focusing on how and what has happened with this investment results. Based on the responses, some investors enter the market with Hope (Returns) while some investors enter the market with Fear (Risk). Investors have difference in return and risk preferences clearly showing that all investors do not follow the rule of traditional finance where it is assumed that all investors have same expectations regarding return and risk. This fear and hope scenario takes the investors in behavioral trap by not going out of the boundaries which they have created making the market inefficient not to play at its own fundamentals. All investors responded that they meet their basic needs first and then secondary needs afterwards showing that investors follow the approach of pyramid where they try to meet their basic needs in such a way where they can get stable cash flows, once they needs have been matched, then they start investing in bit riskier investment to meet the upper layer of the pyramid. This practice shows that investors segregate their investments and focus on individual investment with risk and return attribute. Traditional finance

recommends the clubbing/collection of different investment taking a portfolio perspective to reduce the risk or diversify. Investors do not follow this aggregation rule when they go for stock investment rather take an isolation approach to better manage the needs with relevant cash flows. This trap makes investors to look at investment with its own boundaries neglecting the ideology of diversifying the risk.

Traditional finance assumes market efficiency prevails as new information is going to impact stock prices instantaneously. Investors, when acquired about market efficiency, responded that this efficiency does not hold in Pakistani Market as this market has its own way to behave. Efficiency is not our cup of tea as the general perception prevails in this market. It does not follow what other markets follow in developed markets. Investor's response analysis suggests that all players have their own way to interpret information based on their own beliefs about firm, firm's performance, market and market behavior. Investors follow the rule of Crowd saying that when anyone does not have any idea about the news and news impact, investors start following what rest of the players is doing in the market. This gives them a psychological peace as if something goes wrong with this decision, it will impact all those who followed the herd, giving reasoning that all were on the same boat or all have the loss syndrome to decrease the feeling of regret. This trait of relying or following crowd gives investors to soothe the frustration as many others are his partner in the loss seeking world where others also bear the burden of loss putting less weight on everyone. But when acquired about this crowding behavior where results are upward, investors try to give this credit to themselves by give reasons that by becoming part of crowd I made them strong in trend. Majority of the investors have no idea about stock or any other investment correlation behavior. They responded that this correlation behavior in stock investment has less impact reason being investors most of the times follow their own methodology to invest rather than portfolio perspective which assumes correlation property to diversify the portfolio risk. This is quite obvious in a sense that investors in this local market are more judgmental and play based on their investment expertise which does not follow the rules of traditional finance. When majority of the investors in the market selling the stocks based on any parameters, all respondents are of the view that they will also start selling irrespective of the other's view. When investors start doing the same what rest of the players are doing (selling pressure), they make the stock market more volatile as it starts propagating the loss spiral. This behavior of the investors exacerbates the market activity giving fuel to the fire making the traditional finance view of market efficiency less practicable. Most of the investors gave a positive signal to this notion based on their experience or opinion. However, it is not the case all the time, investors trapped by this syndrome; believe that I can earn extra return all the time I keep taking more risk but a point of time comes where investors need to optimize the tradeoff. From overall perspective, it is important to probe whether investors are needy or greedy which makes the market behavior deviate from the efficiency perspective. Most of the investors have this trait that when they invest in a stock with certain price target, as price starts moving towards that target, they start feeling that their analysis or price expectations are as per the market. When price comes closer to the targeted price, they revised the target upward, portraying the confidence in their target setting and re-setting behavioral trap, moving investors in confidence zone which may be illusion or a bet which comes true only once in a blue moon. But one bet makes investors feel happy about the process which he adopted. Investors responded that this target revision behavior is purely a game of experience or gut feelings which help to re-visit their own rule of thumb over a period of time. Investors are of the view that when investing in any stock, past record of the firm strengthens their opinion about future performance as well like a firm which has been regular in dividend payment will keep paying dividend over extended period of time. Few investors are of the view that both parameters are required for stock investment but they do not have valid barometers to base their analysis. All that is exercised is applying the if-that rule of thumb creating a reasoning pattern for their analysis that if firm goes for x activity, that will help to perform well in future. Again this if-that fallacy has superior influence in their decision making process which totally moves away from traditional finance perspective which follows certain fundamentals to work for future performance.

Majority of the investors has preference for fertilizer, energy and banking co's stock in their favorite list to invest. When asked about why these sectors, investors has no proper methodology why to go for these stocks. The responses were like everyone needs electricity, so demand will remain there and firm will keep performing, everyone needs banking services, so banks will keep running their shop. These responses show investors have concentrated their investment in certain sectors which can go against them if something goes wrong with the sector. Investors regarded this over-focused activity as over a period of time, we have not witnessed losses in these sectors, further strengthening their belief that they have above average ability to read the market sentiments. Majority of the investors have no exact idea about what this

behavioral finance is all about. Their activities, beliefs, attitudes and behavioral biases all engrossed in their investment domain but ignorant of these traits does not mean they have no idea about this field of finance. They know about this but do not have words to explain it. They agreed to these personality traits or biases as they play important role in stock investment as majority of the subjects use their own frame to judge stock market movement and then reacting as per what their intuition tells them. This digression of ignoring financial models or parameters and ultimately relying on traits or personally developed reasoning patterns which has more influence on investment clearly tilt the criteria towards the new field of finance where focus is on the attributes or qualitative perspective of the investors rather than the quantitative part which investors feel that these numbers are only true or work in imaginary world.

## **7. Conclusion and Recommendations**

Overall pattern of the study concludes that two variables overconfidence and pyramid are significant on an overall basis and with the split data confirming the previously conducted researches where these variables have impact on the stock investor's decision process. Based on the study's results both from Quantitative and Qualitative analysis perspective, the overall pattern which investors follow in their investment decision making process is that they do talk about financial models like focusing on sales, cash flows pattern, P/E, P/Sales Multiples etc but behave differently based on their own pattern which they have developed when to quit and enter the market. Sometimes they try to capture small gains ignoring what their own model has suggested not to quit at this point in time because holding for longer will give more gains. Investors have the tendency to follow recent performer and put more weights to buying these outperformers pushing the prices higher causing additional buying more expensive which may cause more losses when market moves down. From the quantitative analysis perspective, two variables overconfidence and pyramid have significant impact on stock investment decision to go for more buying and creating a logical reasoning pattern from the cash flow and return perspective following the pyramid approach. Investors based on their experience, overall performance over a period of time, chances of bets getting positive results and regret behavior over bad events or losses make investors get trapped in what their opinion or judgment is recommending. Investors do follow some sort of analysis on firm's fundamental but regards experience, hindsight and judging power more important in Pakistani financial market. Investors blame that Pakistani stock market is not efficient as traditional finance suggests because information which comes to market is not accessible to all and all investors do not have the same information interpretation pattern. Even the credibility and authenticity of the information about firms and their future plans are also weak making investors use their own way of decision to buy or sell the stock. On an overall basis, investors at KSE are more trapped by personality traits as they invest what they observed, witnessed and experienced good and bad events over a period of time. This tilt attitude of the investors towards more on the judgmental and parameters which influence their reasoning pattern have more profound effect on stock investment decisions. Investors at KSE are also trapped by what they have heard in the street and then start linking with the screen making them follow more of a behavioral approach to stock investment making decisions. Investors also portray a tendency to become part of herd or crowd to in order to reduce the feelings of regret giving a soothing reasoning to themselves that others are also part of the crowd who suffered in downward trend but when they are trapped by illusion of their knowledge and things move in their way, investors have tendency to assign this over performance to themselves making them more overconfident in their abilities which further make stock investment decisions based on behavioral approach.

This study does not reject the notion of traditional finance modeling approach but highlighted few areas of traits which impact investors' behavior to move in certain direction which traditional finance misses in the stock investment decision making process. So there is need to work on both lines where financial models can capture the behavioral aspects of the investors to make more informed and unbiased process for stock investment. Behavioral finance field is getting momentum and evolving focusing on investor's psychological profiling to understand how investors change their view about the event based on any pre-conceived patterns over a period of time and why don't investors change their view even the rests of the players in the market are behaving differently. These changing pattern and behavioral aspects of investors once captured through psychological process can make traditional finance models more effective to lead towards efficiency. Traditional finance field which was once thought purely of number game is no longer quantitative in nature as humans have different moods to react differently even in the controlled or are in the same setting of investment process shows that there is a need for psychologist, sociologist and specialist in neuron sciences to work along with finance expert to analyze the actions and reactions of the investors to make their financial models work effectively as these models missed altogether this piece in

their assessment of stock price movements. The objective of this study is not to refute one over the other approach in stock investment decision but to high gray areas which are missing in traditional finance models which can be covered or added to make the stock market move without biases or trapped by judgmental approach which makes stock market not to work or behave purely based on its own parameters. If these biases have been accounted for by assessing the psychological behavior of the investors in stock investment decision can make traditional models work more accurately as these models can give more appealing results which investors can follow confidently. Based on the overall analysis of the situation, it is concluded that a point of time will come where psychologist and brain scientists will take a place in financial world to identify the personality traits of the investors to better judge the deviations and reasons of the crisis where investors sometimes based on impatience start doing what is not recommended at that point in time. One proposition based on the study is that in order to check the rationality or irrationality and need or greed behavior of the investors, a psychological testing can be done on the investor's behavior in a certain good or bad events and how do they react to these events as sometimes jubilation takes lead over the regret. Another approach could be to assess the anomalies of the traditional finance model and then psychological results of individual behavior are tested to extract the reasons of the observed market scenario. The importance of the behavioral finance can be realized from this fact that noble prize for economics was awarded to a psychologist (Daniel Kahneman) in 2002. This shows that traditional finance models will not be able to prove something purely based on numbers but they have to have logical reasoning pattern of the individual who is involved in development of those financial models to better capture the traits trapping attitude or judgment or biases involved.

To understand the investor's traits for more generalized results, the study should be conducted across other exchanges as geographical and cultural differences can add more appealing results. This study did not cover the actual amount invested in stock and frequency of buying and selling behavior because investors are not interested to share that piece of information. If data is available on these two important areas which can add more values to the studies as true behavior can be captured. Additionally investor's class like small investor, large investor is also important, if this area is covered, it will give more clear idea about the behavior of investor based on the amount invested. Available of large sample size it will help to better replicate the population for more accurate results. The actions and reactions of the investors in certain situations to understand the anomalies and investor's need and greed situations which make the market efficiency dwindle can be further linked by involving psychologists, sociologists and behavioral scientists in these kinds of studies.

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