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Impact of Investor Personality Types with interaction Effects of Demographics on Investment Behavior: Evidence from Pakistan

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Abstract

The study consists of three dimensions of investor personality types having psychological biases and investment behavior. The purpose of this study is to empirically examine the relationship between investor personality types and investment behavior in the stock market of Pakistan. Questionnaire based cross sectional survey was conducted to collect the primary data from individual investors in the Islamabad Stock Exchange of Pakistan. Multivariate regression results reveal that investor personality types significantly influence the investment behavior of individuals. This entails that investment adviser and their clients can make suitable investment programs by considering the three dimensions of investor personality types (having cognitive and emotional psychological biases) toward the investment behavior of individual investors. This study captures the attention of investors, to the combine usage of both standard finance and micro behavioral finance that might be guiding principle for determining the investor's personality type. Finally, the investors would be in the position to construct the profitable investment in the stock market.

Keywords: behavioral finance, investor personality types, investment behavior and behavioral biases.

1. Introduction

Equity investment environment is becoming very competitive in current time period. Majority of the investors and investment advisory consultants focus on standard finance models and ignore the investor personality types which consider psychological aspects. These behavioral tendencies of personality types can have impact on investment behavior of individual investors and can cause of several deviation mistakes while investing in stock market. Investors include over and under reaction in the equity market, loss of investment, hold undiversified portfolio and make unprofitable decisions. The focus of this study is on investor personality types and its impact on investment behavior of individuals in equity market.

This research composed of two main pillars, one is investor personality types and other is investment behavior of individuals (male and female). Personality is an active institution within the individual, having psychophysical schemes that produce the attributes and outlines of manners, views and thoughts. As explored by Allport (1961) personality is a vibrant association in the inner self of the human beings of psychophysical structure that make the person's trait prototype of actions, judgment and mind-set.

According to Sadi et al. (2011) the significant aspects on the individual's verdict may influence the buying and selling of stock as well as the presented perceptual blunder have considerable association among the personality of investor. As Chao et al. (2012) propose that the people who belong to the investors' categories, their psychological biases are presented in the diverse personality types.

Pompian (2006) first time explored the three dimensions of personality types. These are idealist versus pragmatist, framer versus integrator and reflector versus realist. Individual who fit into the idealists can be the theme to the subsequent biases: overconfidence, optimism, availability, illusion of control, confirmation, recency and representativeness. On the other hand, pragmatists being an investor are classically not prone to the abovementioned biases. While in second dimension, framers may be subject to these biases: anchoring, conservatism, mental accounting, framing and ambiguity. Integrators don't have aforesaid biases of framers. In third dimension, reflectors prone to the following biases: cognitive dissonance, loss aversion, endowment, self-control, regret, status quo and hindsight but realists do not prone to biases of reflectors. Pragmatist, integrator and realist thinking are opposite to the idealist, framer and reflector. Now it may be cleared that, if the investor personality types are idealist, framer and reflector then the investor has some cognitive and emotional biases which may lead to investment inaccuracy. On the other hand, if investor personality types are pragmatist, integrator and realist then there will be no cognitive and emotional biases which exhibit that the investment behavior of individuals is not inappropriate. Filbeck et al. (2005) acknowledge that the significant relation of personality types and behavioral characteristic of investment is investigated by scholars. Investment behavior focuses on financials assets diversification, know-how tendency, outline of participation in investing activities, pervious and future footstep for scheduling of investments, fondness of investment, hazard acceptance point, resources possession, management of monetary responsibilities, threat taking intensity and investment liking. To date, there is a lack of empirical research that examines the relationship between personality types (having psychological biases) and different aspects of behavior.

Thus, the unemotional and true behavior of investors toward the equity investment in the stock market encourage us to examine the influence of personality types (having psychological biases) on different aspects of investment behavior of individuals. The investor personality that might have cognitive and emotional biases and their impacts on investment behavior of individuals in unclear circumstances can be rectified by knowing them. Thus, this study attempts to answer the following research question**.**

1.1 Research Question

How does investor's personality types' (having psychosomatic biases) affect investment behavior of individuals?

The purpose of this study is twofold: First, to empirically examine the relationship of personality types (having psychological biases) and investment behavior in the stock market of Pakistan. Second, this study aims to analyze the influence of personality types on investment behavior of individual investors. Too much buy and sell of shares and unclear situations can lead to the bad return which may be avoided. The investors may keep themselves away from deprived portfolio recital. Furthermore, risk and tolerance level may be matched and may not grasp unexpanded nest of financial assets. In order to survive under lesser resources, investors may learn to accumulate on a regular basis.

2. Literature Review

This section describes the different components of above mentioned personality types and their consequences toward different aspects of investor's behavior. According to Akhtar et al. (2015) personality may cause the inconsistency in the decision related to the investment. Recently, Tauni et al. (2015) studied and found the direct relation of personality types and trading behavior of individual investors in the future market of Chinees economy using a sample size of 333. An other study by Tauni et al. (2016) in the Chinees future market with same sample size also confirm the results of previous investigation.

Scholars in the field highlight the individual investor's cognitive capability and approach of judgment. As Lubinski and Humphreys (1997) clarify that common cleverness of investors or their varieties of unambiguous cognitive skills are considered significant contributory factors of verdict making process in the capital market. Frederick (2005) reported that cognitive reflection tests are helpful for the explanation of decision making process that forecast about the preference of interest of people. The author also proposes that those who have more cognitive reflection score are more tolerant about the risk. Sarojpant and Dumka (2014) explore that investment behavior has connection with psychosomatic surface of personality. Gerrans et al. (2015) find that personality has relation with behavioral aspect of investment as patience related to financial risk.

The components (biases) of the investor personality type may be: *overconfidence*, the way not just buying and selling however as well the pitiable portfolio recital (Biais et al., 2005). Similarly, Fenton-O'Creevy et al. (2003) argue that overconfidence have a harmful fender-bender on the shares operations recital in the stock market.

Deaves et al. (2008) fail to make the decision about the effect of gender characteristics on the trade of financial securities like shares. Overconfidence is widespread energetic noticeable reality in which purchaser and supplier in the stock market powerfully think that their information are facts, due to which more overconfident investors may be able

to show the trading actions at bulk and feel power over the buying and selling outcome. Daniel et al. (1998) identified *self-attribution bias* while investigating the behavioral biases impact on the market prices of shares, similar kind of results are found by (Gervais & Odean, 2001). In some situations individuals claim the recognition for the earlier period achievements and give the responsibility for their collapse to the unpleasant destiny. As Barberis et al. (1998) shape the feelings of investor in a situation where some time investors are more confident about the latest information as compare to past information in the financial capital market. As Cohen & Kudryavtsev (2012) document that illogicality may not be recognized while making the verdicts for the stock investment. They also find that investment in the equity shares is affected by the anticipation, previous know-how in the stock market as well as awareness concerning the historical recital of preferred market indicators.

Lai and Wang (2014) investigate that stock market returns have relationship with investment behavior as buying and selling activities. As Higgins (1996) explores that probably having inappropriate oral information may generate the relations so as to control rulings.

Hirshleifer (2001) demonstrates that only some psychological supported approaches may price the securities and permit in favor of jointly threat disliking. He further explores that the belongings of dissimilar rates of rectification on behalf of aspects as well as long-term and overreaction in the financial markets.

Barberis et al. (1998) describe the *conservativeness* as the people formed the thoughts in circumstances as in various occasion individual grants a smaller amount value to one hand information. Thaler (1985) considers that *mental accounting* and narrow *framing* are similar when contracted envelop have split psychological monetary proceedings of profits and fatalities, as well as to reviewing the every narrative just irregularly at the same time as the activities are related. *Framing* is the bias of opinion and verdict; it may engage in investigating troubles in excessively cut off way. Kahneman and Lovallo (1993) and Read et al. (1999) mention that narrow *framing* hold your attention in examining the harms in extremely out-of-the-way manners. Peters and Slovic (1996) explore that *ambiguity aversion* give the impression to mirror an extra wide-ranging propensity in favor of sentiment i.e. the panic to influence hazardous preferences.

Aronson (1968) suggests that *cognitive dissonance* by and large as a pessimistic constrain situation, which take place when a human being at the same time grasp dual cognition (ideas, beliefs, opinions), which may be contradictory in the psychology of individuals. HDFC securities (2011) demonstrates that *loss aversion* theory states individuals react in a different way, to the same circumstances depending on it may be offered in the perspective of a failure or a success. Majority of people who belong to the investor's category may be the hazard reluctant while pursuing the profits however may turn out to be hazard enthusiast as the authors attempting toward avoidance of failure. Horowitz and McConnell (2002) mention while investigating the money matters, the individual's enthusiasm to shell out vary significantly as of their enthusiasm toward acknowledgement. Individuals comprise of several features which are linked with investment behaviors. According to Vissing-Jorgensen (2002) the explosive nature of proceeds of the non-financial is pessimistically associated to stocks in the equities. Heaton and Lucas (2000) discover that individuals starting the business on the base of their own risk and resources may be associated to a minor investment of share equity,

probably as a result of the personal characteristics such as risk. Bouchard Jr (1998) explores that the investment behaviors is largely affected by the family unit surroundings in the start of the time of individual's life. Campbell (2006) exhibits that people demographic characteristics (like their education and literacy) related to the monetary matters may influence their investment behavior. On the contrary, Van Rooij et al. (2011) state that only education is personal feature which may affect the stock market participation. Poterba et al. (1995) point out that individual's typical resources may influence the allocation of assets in the capital market. Guiso and Jappelli (2002) indicate that participation in the capital market may be affected due to the wealth of the individuals. Barsky et al. (1995) mention that individual's characteristics as hazard disliking may influence the apportionment of resources. Charles et al. (2003) also state that involvement in the equity market may be influenced by behavioral features (threat disliking) of individuals.

Hira and Mugenda (2000) found that gender have considerable command over the investment behavior in shape of gratification through the monetary circumstances, monetary visualization and behavior of expenditure. Barber and Odean (2001) state that female individual investors have propensity to think more about the decisions of investment outcome in insignificant buying and selling rate as well as superior proceeds. Sunden and Surette (1998) highlight that the function of variables related to the demographics(like the matrimonial category, job-related mixture of alternative as well as status around the clock) of female affect the behavioral features of investment. Dwyer et al. (2002) mention that the consequence of gender category is considerably destabilized as the information differences of monetary markets as well as investments vanish.

Love (2010) stated that investment behavior of people affected through their marital status. Meier et al. (1999) mention that husband subordination previously exposed maximum in self-governing affiliation as well as the decisions in which wife dictating role mentioned extra regularly than in conventional relationship of husband and wife. Powell and Ansic (1997) state that the hazard intensity level of married couple jointly nest of financial assets is among the hazard intensity level of the couple of person's nest of financial assets. Meier et al. (1999) report that next of kin having more skills as compare to their fellows may exercise extensive domination in the process of decisions of investment.

Beyer and Bowden (1997) demonstrate that male individuals have a propensity to believe the skills in monetary affairs as compare to the female individual. Barber and Odean (2001) mention that male individuals have a tendency of overconfidence regarding the verdicts aptitude of monetary matters and wedded male and female affect each other decisions about the investment. In this manner plummeting the consequences of sexual category disparity in their excessive confidence. Thus, on the basis of above literature we propose the following hypothesis:

- **H_1:** Investor personality types (having psychological biases) influence the investment behavior.
- **$H_{1\,(a)}$**: Idealist personality type influences the investment behaviors.
- **$H_{1\,(b)}$**: Pragmatist personality type influences the investment behaviors.
- **$H_{1(c)}$** Framer personality types influence the investment behavior.

- **$H_{1\,(d)}$**: Integrator personality type influences the investment behavior.
- **$H_{1\,(e)}$**: Reflector personality type influence the investment behavior.
- **$H_{1\,(f)}$**: Realist personality type influence the investment behavior.

3. Methodology

3.1. Sample and procedure

The target population consists of all investors in the Islamabad Stock Exchange of Pakistan. We randomly select sample of 150 individual investors. The researcher personally distributed the questionnaires among the selected sample. We select this sample size because sample size depends on researchers' available resources including time and finance (Saunders et al., 2011). This data collection process continues for two months. Finally we received 100 useable questionnaires which yield a response rate of 66%. This response rate is favorable as Hair et al. (2011)suggest that for qualitative study, as a minimum 100 respondent should be enough for the multivariate data analysis. Our response rate is also close to other studies in the field. Luu (2011) and Luu (2013) propose that 63% response rate is moderate high for questionnaire survey.

3.2. Measurement and Data Analysis

To measure the investment behavior of individuals we have used the scale of Hira and Loibl (2008). Data for the investment behavior is on the five point Likert scale. For measuring the investor personality types (having psychological biases) we have employed diagnostic test of Pompian (2006). Data for the personality types and demographics features is in the shape of "0" for absence and "1" for the presence of feature. Cranach's Alpha (0.72) shows that construct reliability is acceptable (George, 2003).

In order to know that our sample is adequate for data analysis we use KMO test. The sample adequacy (0.509) shows that our sample size is within acceptable range. To further ensure the multicollinearity issue between items of investment behavior, we have applied Bartlett's test of sphericity which confirms (1590.022 at degree of freedom 355 having p-value 0.000) that there is no issue of multicollinearity. Investment behavior items are adopted from well recognized studies where content validity is already checked. According to Chin (1998); Hair et al. (2011); Hulland & Business (1999) discriminant validity of a single construct cannot be calculated.

Multivariate regression was applied to achieve the objectives of study. For testing the fitness of model we have applied five diagnostic tests of personality types with investment behavior. First and fifth test are functionally mis-specified, whereas second, third and fourth tests are functionally specified. The above mentioned tests are performed by changing the different combinations of personality types and different features of demographics. Investor's personality type combinations with demographic features performed in test-2 are given below in mathematical equations. Where, IB stands for the investment behavior and X1 to X9 are the explanatory variables and α_0 is constant and α_1 to α_9 are coefficients of correlations as

X_1=Idealist-2, X_2=Framer-2,X_3=Reflector-2, X_4=Male, X_5=Married, X_6=Master, X_7=Graduation, X_8=Intermediate and X_9=matriculation,X_{10}= Realist-2 and $X_{11=}$ Integrator-2, $X_{12=}$ Pragmatist-2, X_{13}= Age(25_30), X_{14} = Age(30_35), X_{15}= Age(35_40), X_{16}= Age(40_45), and X_{17}= Age(Above_45), Pragmatist_2*Male= (X_{12*} X_4)=$X_{18,}$

Integrator_2*male=($X_{11*}X_4$)=X_{19},Realist_2*Male=(X_{11*} X_4)=X_{20}, Idealist_2*Male= (X_{1*} X_4)= X_{21}, Framer_2*Male= (X_{2*} X_4)= X_{22}, Reflector_2*Male= (X_{3*} X_4)= X_{23}

$$IB=\alpha_0+\alpha_1(X_1)+\alpha_2(X_2)+\alpha_3(X_3)+\alpha_4(X_4) \quad \textbf{(i)}$$

$$IB=\alpha_0+\alpha_1(X_1)+\alpha_2(X_2)+\alpha_{10}(X_{10})+\alpha_4(X_4) \quad \textbf{(ii)}$$

$$B=\alpha_0+\alpha_1(X_1)+\alpha_{11}(X_{11})+\alpha_{10}(X_{10})+\alpha_4(X_4) \quad \textbf{(iii)}$$

$$IB=\alpha_0+\alpha_{12}(X_{12})+\alpha_{11}(X_{11})+\alpha_{10}(X_{10})+\alpha_4(X_4) \quad \textbf{(iv)}$$

$$IB=\alpha_0+\alpha_{13}(X_{13})+\alpha_{14}(X_{14})+\alpha_{15}(X_{15})+\alpha_{16}(X_{16})+\alpha_{17}(X_{17})+\alpha_1(X_{12})+\alpha_2(X_{11})+\alpha_3(X_{10})+\alpha_4(X_4)+\alpha_5(X_5)+\alpha_6(X_6)+\alpha_7(X_7)+\alpha_8(X_8)+\alpha_9(X_9) \quad \textbf{(v)}$$

$$IB=\alpha_0+\alpha_{13}(X_{13})+\alpha_{14}(X_{14})+\alpha_{15}(X_{15})+\alpha_{16}(X_{16})+\alpha_{17}(X_{17})+\alpha_{18}(X_{12*}X_4)+\alpha_{19}(X_{11*}X_4)+\alpha_{20}(X_{11}+X_4)+\alpha_4(X_4)\alpha_5(X_5)+\alpha_6(X_6)+\alpha_7(X_7)+\alpha_8(X_8)+\alpha_9(X_9) \quad \textbf{(vi)}$$

$$IB=\alpha_0+\alpha_{13}(X_{13})+\alpha_{14}(X_{14})+\alpha_{15}(X_{15})+\alpha_{16}(X_{16})+\alpha_{17}(X_{17})+\alpha_{18}(X_{18})+\alpha_{19}(X_{19})+\alpha_{20}(X_{20})+\alpha_4(X_4)+\alpha_5(X_5)\ \alpha_6(X_6)+\alpha_7(X_7)+\alpha_8(X_8)+\alpha_9(X_9) \quad \textbf{(vii)}$$

$$IB=\alpha_0+\alpha_{13}(X_{13})+\alpha_{14}(X_{14})+\alpha_{15}(X_{15})+\alpha_{16}\ (X_{16})+\ \alpha_{17}(X_{17})+\alpha_{21}(X_{1*}\ X_4)+\ \alpha_{22}(X_{2*}\ X_4)+\alpha_{23}(X_{3*}\ X_4)+\alpha_4(X_4)+\alpha_5(X_5)+\alpha_6(X_6)+\alpha_7(X_7)+\ \alpha_8(X_8)+\ \alpha_9(X_9) \quad \textbf{(viii)}$$

$$IB=\alpha_0+\alpha_{13}(X_{13})+\alpha_{14}(X_{14})+\alpha_{15}(X_{15})+\alpha_{16}(X_{16})+\alpha_{17}(X_{17})+\alpha_{21}(X_{21})+\alpha_{22}(X_{22})+\alpha_{23}(X_{23})+\alpha_4(X_4)+\alpha_5(X_5)+\alpha_6(X_6)+\alpha_7(X_7)+\ \alpha_8(X_8)+\ \alpha_9(X_9) \quad \textbf{(ix)}$$

To check the strength of model and functional specification, we apply additional diagnostic tests 3 and 4 of personality type and find different personality types combinations but these tests (3 and 4) give less explanatory power as compare to the test-2.

4. Results and Discussion

4.1. Descriptive Statistics

Table 1: Descriptive Statistics of Test-2

	Idealist_2	Pragmatist_2	Framer_2	Integrator_2	Realist_2	Reflector_2
Mean	0.34	0.62	0.62	0.37	0.40	0.60
Median	0	1	1	0	0	1
Maximum	1	1	1	1	1	1
Minimum	0	0	0	0	0	0
Std. Dev.	0.47	0.48	0.48	0.48	0.49	0.49
Skewness	0.662122	-0.532181	-0.5322	0.532181	0.4082	-0.4082
Kurtosis	1.438406	1.283217	1.2832	1.283217	1.1667	1.1667
Observations	100	100	100	100	100	100

Descriptive statistics of demographic reveals that 83% respondents belongs to the masculinity class and 17% belong to the femininity class. Marital status of respondent shows that 70% are married and 30% are single. Age group of respondents show that only 1% belongs to 18-25 years, 37% are between the 25-30 years, 21% investor's age is between the 30-35 years, 1% individual investor belong to the 35-40 years, 14%belong to the age group of 40-45 years and 24% respondents are above. Regarding education of

respondents, 4% have M.Phil or MS background, 40% of the respondents are master degree holders, and 44% has graduation degrees, 9% has qualification equal to the intermediate and 3% of the respondents have secondary school certificates.

Table 2: Descriptive of Personality Types of Test

Personality Types	Idealist	Pragmatist	Framers	Integrator	Reflector	Realists
Test 2	34	66	63	37	60	40
Test 3	63	37	63	37	23	77
Test 4	26	74	39	61		

The test-2 results reveal that in the first dimension of personality types, 34% belongs to the idealist and 66% are pragmatist. Second dimension results show that 63% investors are framers and 37% are integrator. In third dimension, 60% respondents belong to the reflector and 40% are realists. In addition, test-3 is also used to identify the investor personality which confirms that 63% respondents belong to the idealists and 37% are pragmatists. On the other hand, 63% investors are framer and 37% belong to the integrator. Subsequently, 23% respondents are reflectors and 77% are realist. The descriptive of test-4 about personality types indicates that 26% people are idealist and 74% are pragmatist. In second dimension, 39% are framer and 61% belong to the integrator personality.

4.2. Correlation Matrix

The correlation results of test-2, 3 and 4 are given in Table 3, 4 and 5 respectively.

Table 3: Pearson Correlation for Test-1

	Idealist2 2	Pragmatist -2	Frmer -2	Integrator -2	Realist -2	Reflector -2	IB
Idealist-2	1						
Pragmatist -2	-0.815	1					
Frmer-2	0.057	0.082	1				
Integrator-2	-0.057	-0.082	-1	1			
Realist-2	-0.221	0.266	-0.097	0.097	1		
Reflector-2	0.221	-0.266	0.097	-0.097	-1	1	
IB	-0.107	0.049	0.243	-0.243	-0.090	0.090	1

*These dimensions of personality type are opposite to each other as per their nature.

Table 4: Pearson Correlation for Test-2

	Idealist -3	Pragmatist -3	Frmer -3	Integrator -3	Realist -3	Reflector -3	I B
Idealist-3	1						
Pragmatist -3	-1	1					
Frmer-3	-0.040	0.040	1				
Integrator -3	0.040	-0.040	-1	1			
Realist-3	-0.278	0.278	0.004	-0.004	1		
Reflector-3	0.278	-0.278	-0.004	0.004	-1	1	
IB	0.246	-0.246	-0.138	0.138	-0.287	0.287	1

Table 5: Pearson Correlation for Test-3

	Idealist-4	Pragmatist-4	Frmer-4	Integrator-4	IB
Idealist-4	1				
Pragmatist-4	-1	1			
Frmer-4	-0.071	0.071	1		
Integrator-4	0.071	-0.071	-1	1	
IB	0.122	-0.122	0.218	-0.218	1

4.3. Multivariate Regression

We run seven multivariate regression models for analyzing the diagnostic tests-2 of investor's personality type with some demographic features. The results are given in Table 6-12 respectively.

Table 6: Multiple Regressions for Test-1 (Round-I)

Independent Variable	Coefficient	T-values	P-values
Constant	3.210	12.553	0.000
Idealist-2	-0.180	-2.048	0.045
Framer-2	0.265	3.010	0.004
Reflector-2	0.068	0.782	0.437
Male	0.187	1.637	0.107
Married	0.010	0.116	0.908
Master	0.218	1.044	0.301
Graduation	-0.060	-0.295	0.769
Intermediate	-0.285	-1.185	0.241
Matriculation	0.498	1.610	0.113
F-statistic	2.689		
Prob(F-statistic)	0.011		
Adjusted R-squared	0.181		

In Table 6, results shows that personality types combination (idealist framer and reflector) and some demographics dimensions, as idealist and framer irrespective of gender either male or female, have significant effect on the investment behavior with explanatory power 18%. It means that the individuals either male or female who belong to the idealist, framer and reflector personality have twenty different biases. Idealist personality types either belong to masculinity or femininity class, composed of six kinds of cognitive and one emotional type of biases as overconfidence, optimism, availability, self-attribution, illusion of control, confirmation, recency and representative. These biases can influence the decisions while making the investment as per their nature. Overconfidence, unfairness may misjudge their extrapolative skill and correctness of information. Person having the optimistic feature may think that all things will be happen positively. Individuals think that it may be possible that success will come from the shortcut ways i.e. self-control bias. Always like to choose the information which may confirm our thoughts. Constantly try to approach the fresh incidents for the solution. Individuals may always choose the information that will be the regular with their pre-created class. As we know framer personality may composed of five different cognitive biases as anchoring, conservatism; mantel accounting, framing and ambiguity aversions. The above mentioned problems collectively may lead to the risky and undiversified

portfolio. Third dimension of personality reflector has no significant effect on the investment behavior in this combination of personality types.

Table 7: Multiple Regressions for Test-1 (Round-II)

Independent Variable	Coefficient	T-values	P-values
Constant	3.278	13.044	0.000
Idealist-2	-0.180	-2.048	0.045
Framer-2	0.265	3.010	0.004
Realist-2	-0.068	-0.782	0.437
Male	0.187	1.637	0.107
Married	0.010	0.116	0.908
Master	0.218	1.044	0.301
Graduation	-0.060	-0.295	0.769
Intermediate	-0.285	-1.185	0.241
Matriculation	0.498	1.610	0.113
F-statistic	2.689		
Prob(F-statistic)	0.011		
Adjusted R-squared	0.181		

Table 7 shows the same effect but it describes that reflector personality (male or female) is opposite as compared to the realist personality as can be seen positive and negative sign of reflector and realist personalities. It also exhibits that the personality types are idealist, framer and realist. The value of adjusted R-square remains same as shown in Table 6 and 7 which is approximately 18%. The change in personality type combinations only changes the sign of personality type.

Table 8: Multiple Regressions for Test-1 (Round-III)

Independent Variable	Coefficient	T-values	P-values
Constant	3.543	14.958	0.000
Idealist-2	-0.180	-2.048	0.045
Integrator-2	-0.265	-3.010	0.004
Realist-2	-0.068	-0.782	0.437
Male	0.187	1.637	0.107
Married	0.010	0.116	0.908
Master	0.218	1.044	0.301
Graduation	-0.060	-0.295	0.769
Intermediate	-0.285	-1.185	0.241
Matriculation	0.498	1.610	0.113
F-statistic	2.689		
Prob(F-statistic)	0.011		
Adjusted R-squared	0.181		

The Same results can be seen in the Table 8, except the sign of integrator. Now the personality type combination is idealist, integrator and realist. Coefficients, t-values and P-values of Table 7 and 8 are same as in the equation (i).

Table 9: Multiple Regressions for Test-1 (Round-IV)

Independent Variable	Coefficient	T-values	P-values
Constant	3.419	13.440	0.000
Pragmatist-2	0.101	1.127	0.264
Integrator-2	-0.245	-2.713	0.009
Realist-2	-0.058	-0.635	0.528
Male	0.179	1.529	0.131
Married	0.009	0.096	0.924
Master	0.204	0.950	0.346
Graduation	-0.056	-0.270	0.788
Intermediate	-0.284	-1.152	0.254
Matriculation	0.472	1.490	0.141
F-statistic	2.263		
Prob(F-statistic)	0.030		
Adjusted R-squared	0.141		

In Table 9, the personality type combinations (irrespective of gender) are pragmatist, integrator and realist, only integrator personality has significant effect on the investment behavior with coefficient 24.45%. In other words rest of variation is due to other personality dimensions. It means that in this personality there is no emotional and cognitive bias, model is fit as shown in the probability of F-statistic but adjusted R-square decreases from 18% to 14% because only one dimension of personality has relation with investment behavior instead of three dimensions.

Table 10: Multiple Regressions for Test-1 (Round-V)

Independent Variable	Coefficient	T-values	P-values
Constant	4.165	9.671	0.000
Age-25-30	-0.785	-2.197	0.032
Age-30-35	-0.602	-1.614	0.112
Age-35-40	-0.627	-1.202	0.234
Age-40-45	-0.725	-1.940	0.058
Age-Above-45	-0.797	-2.107	0.040
Pragmatist-2	0.090	1.006	0.319
Integrator-2	-0.272	-2.928	0.005
Realist-2	-0.084	-0.928	0.357
Male	0.124	1.060	0.294
Married	0.038	0.341	0.734
Master	0.226	1.057	0.295
Graduation	-0.024	-0.115	0.909
Intermediate	-0.194	-0.775	0.442
Matriculation	0.548	1.745	0.087
F-statistic	2.095		
Prob(F-statistic)	0.026		
Adjusted R-squared	0.182		

In Table 10, personality types (irrespective of gender) are pragmatist, integrator and realist. With these personality types new demographic features like different age group are introduced and then observed the results. The adjusted R-square increases from 14% to 18% because of introducing the new demographic features with personality types. The integrator personality type with age group between 40-45 years and above irrespective of gender, has significant impact on the investment behavior with the coefficients 27%, 72.52% and 79.67% respectively. As we can see in the analysis that these specified age groups has more influence on the investment behavior because of experience of investment environment which may create strong relation with investment behavior aspect. With this personality type combination and demographic features we find no biases, hence we can say that there will be no problems toward the investment behavior.

The results also reveal that other explanatory variable have no significant impact on the investment behavior.

Table 11: Multiple Regressions for Test-1 (Round-VI)

Independent Variable	Coefficient	T-values	P-values
Constant	4.049	9.980	0.000
Age-25-30	-0.765	-2.163	0.035
Age-30-35	-0.578	-1.572	0.122
Age-35-40	-0.577	-1.114	0.270
Age-40-45	-0.717	-1.935	0.058
Age-Above-45	-0.784	-2.086	0.042
Pragmatist-2*Male	0.169	1.753	0.085
Integrator-2*Male	-0.285	-2.802	0.007
Realist-2*Male	-0.114	-1.131	0.263
Male	0.208	1.530	0.132
Married	0.005	0.047	0.963
Master	0.242	1.142	0.258
Graduation	-0.027	-0.129	0.898
Intermediate	-0.191	-0.769	0.445
Matriculation	0.648	2.082	0.042
F-statistic	2.283		
Prob (F-statistic)	0.015		
Adjusted R-squared	0.207		

Table 11 indicates that the multiplicative dummy of gender with personality types (pragmatist, integrator and realist) was implied and we found that adjusted R-square increases from 18% to 20.65%. It shows that integrator male personality (with age group of 25-30, 40-45 years and above) and matriculation has significant coefficient 28.51%, 76.55%, 64.83%, 71.66% and 78.36% respectively has impact on the investment behavior. As we can say that when the personality types will be integrator and male then there is no single psychological bias, which indicate that relation with investment behavior exist without psychological illness.

Table 12: Multiple Regressions for Test-1 (Round-VII)

Independent Variable	Coefficient	T-values	P-values
Constant	4.054	10.340	0.000
Age-25-30	-0.764	-2.231	0.030
Age-30-35	-0.643	-1.810	0.076
Age-35-40	-0.572	-1.144	0.258
Age-40-45	-0.732	-2.041	0.046
Age-Above-45	-0.784	-2.160	0.035
Idealist-2*Male	-0.248	-2.614	0.012
Framer-2*Male	0.327	3.350	0.002
Reflector-2*Male	0.115	1.200	0.235
Male	-0.008	-0.060	0.952
Married	0.010	0.098	0.923
Master	0.249	1.215	0.230
Graduation	-0.046	-0.229	0.820
Intermediate	-0.227	-0.943	0.350
Matriculation	0.670	2.222	0.030
F-statistic	2.685		
Prob (F-statistic)	0.005		
Adjusted R-squared	0.255		

In Table 12, the results exhibit that by changing the personality type combination (idealist, framer and reflector) with multiplicative dummy of gender, the adjusted R-square increases from 20.65% to 25.48%. Idealist and framer personality of masculinity class are significant with coefficient values 24.84% and 32.73% respectively. Age group of 25-30, 40-45 years and above is significant with coefficients 76.44%, 73.19% and 78.44% respectively. Education group such as matriculation is also significant with coefficient 67.05%. These significant values collectively have (25.48% adjusted R-square) significant relationship with the investment behavior. As we already mentioned that significant idealist personality type which may be origin of several different mistakes

up to the 25% while assembling the decisions related to the investment in the stock market.

In test-2, it is clear that in Table 8 only idealist and framer, in Table 9 both idealist and framer but in Table 10 idealist and integrator have significant effect on the investment behavior. In Table 11, 12 and 11 integrator personality has significant effect along with specified demographic features like age and education. But in Table 12 idealist and framer personality of masculinity class, specified age and education have significant effect.

The robust of model was checked by the alternative test-3 and 4 of personality type. Second type of test of personality type of investor is test-3 that has different aspects but has less explanatory power as compared to the test-2 and test-4.Test-3 has four types of results and has different personality combination as idealist, framer and reflector. The value of adjusted R-square 8.95% that is different from the results of test-2 as mentioned above. Statistically 8.95% adjusted R-square is weak as compare to the test-2 results. The robust of model has also been checked by the third type of test of which is test-4 that has different aspects but has more explanatory power as compared to the test-3 and less explanatory power as compare to the test-2.

5. Conclusion and Recommendation

Pakistan's stock market has been a very interesting case in analyzing the impact of personality types, as some recent studies have demonstrated very attention-grabbing results (Haroon, 2012; Mahmood & Shah, 2015). Keeping in view these studies and different personality types' combination in test-2, we find that the variation in the investment behavior due to the personality types and demographic features is 14% to 25.48%. The significant personality type combinations with opposite sign are: a) idealist, framer and reflector, b) idealist and framer, c) idealist and integrator and d) integrator. When we use these personality types with multiplicative dummy of genders, we find that maximum explanatory power of the terms is 25.48%. Hence it is declared that test-2 provide the helpful empirical confirmation in the favor of the hypothesis 1 (a), (c), (d) and (e). However, hypothesis 1 (b) and (f) are not supported by the test-2.Various combination of the personality in the test-3 shows that explanatory power of the personality types toward the investment behavior is 8.95%. The significant personality type combinations with opposite sign are: a) Reflector, b) Realist, c) Realist and d) Realist. Test-3 conclude that hypothesis 1 (e) and (f) are accepted but the remaining hypothesis 1 (a), (b), (c) and (d) are not supported.

Different personality type combination with demographic features and multiplicative dummy of the gender are analyzed through test-4 and observe that the variation in investment behavior range from 10.66% to 16.52%. As observed in test-2, these personality types combinations when used with the multiplicative dummy of gender has maximum explanatory power of the independent variables 16.52%. In test-4, the significant personality type combinations with opposite sign are framer and integrator. We find empirical support in the favor of the hypothesis 1 (c) and (d) but the evidence in the favor of the hypothesis 1 (a), (b), (e) and (f) are not supported.

The main objective of the study was to examine the impact of investor's personality types (having psychological biases) on investment behavior. Test-2, 3 and 4 results reveal that the variation in the investment behavior due to the investor's personality type (having

psychological biases) and their demographic features is 14% to 25.48%, 9% and 10.66% to 16.52% respectively. But the variation in the investment behaviors by the test-3 is less as compared to the test-2 and 4. The variation in the investment behavior explained by the test-4 is least as compared to test-2. Hence, test-2 explains the maximum 25.48% variations in the investment behavior due to the personality type of masculinity class, having psychosomatic biases and demographic features.

5.1. Policy Implication and Future Directions

This study discloses that investor's personality (having specified behavioral biases) can be a strong medium to manage and improve the investment decisions and to attain superior monetary benefits for the individual investors. This investigation provides the sensible statistically proven evidence about the investor's personality type. This investigation captures the attention of investors, to the combine usage of the standard finance and micro behavioral finance aspects that might be the guiding principle for determining and revealing the investor's personality type. Finally, the investors would be in the position to construct the profitable investment in the stock market. This study of three dimensions of investor's personality type can be expanded up to the rising capital markets, flourishing economies and urbanized human race for quantifying the impact of investor's personality types on investment behavior. This research may boost the generalization of the results and may be able to entirely discover not just impact but attempt to build up several comprehensive models to develop the profitable investment program that may be acceptable.

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