

Predictors of Investor Overconfidence in Karachi Stock Exchange

Faid Gul* and Naveed Akhtar**

Abstract

Over the decades financial market researchers come up with resounding evidence about the influence of investors' behavior on investment decision making. In pursuit to be counted as pure science, economists and conventional finance researchers ignored possible effect of behavioral aspects on investment decision making. They assumed investors as rational and thus financial markets as perfect. But this line of thinking was unable to explain the events unfolded in financial markets over 1980s-2000s. During the period behavioral economics and finance got importance and acceptance around the world. The field of behavioral finance is fairly new in Pakistan therefore this study aims at analyzing the possible predictors of investor overconfidence. Using data from a sample of 229 investors, strong support is found for the model. All of the findings either support the findings of historical studies or in accordance with the basic theories in the area of behavioral finance.

Keywords: Overconfidence, Portfolio turnover, Diversification, Risk tolerance, Trading frequency

Introduction

The field of behavioral finance has emerged over the last four decades particularly because of the difficulties faced by traditional finance in explaining the creation and subsequent burst of financial market bubbles. The traditional approach of finance is based on Von Neuman and Morgenstern (1944) expected utility theory and Savage (1954), subjective utility theory; both these theories are regarded as the rational preference theories for decision making under risk and uncertainty, respectively. Traditional finance paradigm assumes that all investors are “rational” in their decision making. Rationality means that when an investor receives new information, he updates his beliefs and forms expectations correctly, in accordance with Bayes' probability law. Rationality also means that, given his beliefs, an investor makes choices that maximize his total utility, which is solely a function of the risk and return of different investment alternatives.

* Dr. Faid Gul, Faculty of Management Sciences, National university of Modern Languages, Islamabad

** Dr. Naveed Akhtar, Faculty of Management Sciences, National university of Modern Languages, Islamabad

Based on these simple assumptions, the Efficient Market Hypothesis (EMH) was developed by Fama and Samuelson independently in 1960s. This concept quickly gained acceptance and financial markets were considered extremely efficient about individual security's price and financial markets as a whole, as noted by Fama (1970). Such strong faith in EMH is evident from the article of Jensen (1978) who declares that "there is no other proposition in economics which has more solid empirical evidence supporting it than the Efficient Market Hypothesis." But there were some contradictory findings about the expected utility theory and subjective utility theory, which form the very foundation of EMH, even in early 1950s, e.g. Markowitz (1952), Simon, (1955, 1957, & 1959). Such a firm faith in market efficiency is no more held by even the strong supporters of EMH, e.g. Fama & French (1988, 1989, & 1992), Fama (1998) and Malkiel (2003).

Behavioral finance, on the other hand, is taking the role of explaining aggregate market as well as individual investor performance and decision making under complex situations. The field of behavioral finance is built on the Prospect Theory of Kahneman & Tversky (1979) and Cumulative Prospect Theory of Tversky & Kahneman (1992). It assumes that real human beings, rather than the "homo-economicus" as assume by traditional finance, are limited in their abilities and capabilities to process information. Similarly, real human beings are limited in their attention capacity hence their ability to handle multiple tasks simultaneously is limited (Kahneman, 1973). Therefore, investment decisions, which are often very complex, exceed the cognitive abilities of people and therefore investors are unable to deal with them in the way traditional economics and finance theory prescribes. When making complex decisions people often rely on a few simplifying rules-of-thumb or heuristics which do not evaluate all the alternatives and their consequences as stated by the traditional logic based decision making (Kahneman and Tversky, 1974). In fact, people are bounded by their cognitive capabilities in even simple economic decision and rely on heuristics as noted by Gabaix & Laibson (2000).

There are some studies conducted in Asian financial markets, other than Pakistan, to empirically test behavioral finance theories, e.g. Koutmos & Saidi (2002), Yu, Yong & Xiao-wo (2004) and Mahajan & Singh (2008). But in Pakistan this area of research is still very new and there is only a limited literature available about the decision making of investors in Pakistani financial markets. This study adds a new dimension to the existing body of knowledge about Pakistani financial markets, e.g. Haque (1997), Kanasro, Jalbani & Junejo (2009), Akbar & Baig (2010), Mohammad & Hussain (2011), Arshad, Rani & Shaikh (2012) and Mahmood, Rahman & Ali (2012).

Literature Review

Historically, economists distinguished their field of study from other counterparts, like psychology and sociology, by stating that there is no room for personal beliefs and preferences while making economic and financial decisions. These beliefs and preferences, if shapes the economic decision making behavior of economic agents, will create biasness in the decision making of financial market participants. Whereas economic theory is based on rational decision making and any irrational decision making is quickly undo by rational agents (Friedman, 1953) through arbitrage activity. Since the field of traditional finance is built on the same basic principles set by economists, therefore, it takes the same view of financial markets and its participants. This is based on the Friedman (1953) school of thought who takes the view that any deviation from the fundamental value will quickly be undone by rational investors by forming risk-free arbitrage with a zero net investment. But, in fact, as noted by Barberis & Thaler (2003) even if investors are aware of the mispricing, the deviation from fundamental value remains there, because of the behavioral biases. Similarly, the simplistic assumption about arranging a risk-free arbitrage with zero net investment is not true in the real world financial markets as noted by Shleifer & Vishny (1997).

Investor Portfolio Turnover

Portfolio turnover means that how often the securities held in a portfolio are replaced by regularly buying and selling them in the market. Gervais & Odean (2001) state that investors, who have a high portfolio turnover, have a high level of overconfidence. Statman, Thorley & Vorkink (2006) state that in relation with biased self attribution the trading volume of overconfident investors fluctuates with the returns they get in past. Scheinkman & Xiong (2003) present a model in which overconfidence creates disagreement among investors about asset fundamentals. This disagreement results in more turnover of their portfolio. Oh, Parwada & Walter (2004) investigate the trading behavior and performance of online vs. other equity investors on the Korean stock market. They find that online investors are overconfident investors who provide liquidity to other investors and the overall market by trading higher volumes in financial markets. Graham, Harvey & Huang (2009) also find that more educated investors have a high portfolio turnover as they are overconfident as compared to less educated investors.

Li, Peifei, Weiqiang, & Hongbo (2013) using account data from a security firm in China find that investors' overconfidence increases due to higher past returns and it is reflected in the higher trading volume or portfolio turnover. In this study it is hypothesized that investors' portfolio turnover is a significant predictor of investors' overconfidence.

Investor Frequency of Trading

The frequency of trading measures how often an investor trade in financial market. Trading frequency can be defined as the number of trades an investor makes over a given period of time, say a day or a week. Scheinkman & Xiong (2003) present a model in which the overconfident behavior of investors is evident from high frequency of trading. Park, Konana, Gu, Kumar & Raghunathan (2010) find that optimist and overconfident investors trade more frequently in financial markets. Trinugroho & Sembel (2011) also come up with the findings that overconfident investors carry out a large number of frequent transactions but they gain low returns and it negatively affects their investment performance. It is, therefore, hypothesized in this study that investors' frequency of trading in financial markets is a significant predictor of investors' overconfidence.

Investor Risk Tolerance

Risk tolerance is defined as the degree of variability in portfolio returns that an investor is ready to accept. This is the willingness of an investor to tolerate the decline in the value of his portfolio while waiting for it to increase. Scheinkman & Xiong (2003) present a model of investors' overconfidence and show that such investors have a high risk tolerance. Oh, Parwada & Walter (2004) investigate the trading behavior and performance of online vs. other equity investors and conclude that online investors take higher market risk as an opportunity to earn higher returns. This gives rise to higher volatility (risk) in the financial market; while the frequency of trading and portfolio turnover is also on the higher side as online investors are selling indiscriminately. It can be concluded from the findings of this study that higher risk tolerance of investors is an indication of their overconfidence. According to Menkhoff, Schmidt & Brozynski (2006) the overconfident behavior of investors is characterized by high risk taking. They explain overconfidence as a miss-calibration and it will decrease with the increase in experience. Therefore, it is concluded that higher risk tolerance is positively associated with investor overconfidence.

Number of Different Securities Held (Investor Portfolio Diversification)

The number of different securities held by an investor in his portfolio can also be used as a possible predictor of investor overconfidence. Glaser & Weber (2009) conclude that the group of investors who have well and right predictions about their past portfolio returns exhibit higher overconfidence and usually reduced the number of stocks in their portfolios. The same is hypothesized in the current study that less number of stocks held by investors is a predictor of their overconfidence. But Graham, Harvey & Huang (2009) find that competent or more

educated investors have more diversified portfolio across the globe as compared to less competent and less educated investors. These two studies are having contradictory findings about portfolio diversification of overconfident investors. Since this study is about investors' behavior in KSE where majority of the investors are investing only domestically therefore it is hypothesized that there will be a negative relation between an investor overconfidence and number of stocks held in the portfolio.

Time Duration of Stocks/Securities Held (Investor Investment Time Horizon)

Duration of stocks held is the time period for which an investor keeps the securities before selling them. This area is not explored in much detail as compared to the other variables included in this study. One possible explanation of time duration of stocks held is that overconfident investors believe they can identify the under and overvalued securities better than the fellow investors therefore, they may hold the stocks for a little longer as they expect the stocks to increase in value when others may be selling them. There is an alternative explanation possible where investors holding stocks for short duration may be predicting their overconfidence. This is possible where overconfident investors believe they can better time their investment decisions. They identify the under and overvalued stocks quickly and make the appropriate buy or sell decisions quickly without holding to their investment for too long. The historical literature on this variable is not abundant but based on the literature regarding turnover and trading frequency of overconfident investors it is easy to hypothesized that overconfident investors will keep stocks for shorter time period before they replace them with new stocks. In this study the latter explanation of time duration of stocks held is assumed and hypothesized that shorter time duration of stocks held is a predictor of investor overconfidence.

Overconfidence in Economics and Finance

According to Skala (2008) the term "overconfidence" has been widely used in the field of psychology since 1960s. Economists started implementing the findings of psychology into economic models starting in the 1970s e.g. Tversky & Kahneman (1973), Kahneman & Tversky (1974), Kahneman & Tversky (1979), but the most rapid development of that trend began in the 1990s e.g. Yates, (1990), Gul (1991), Heath & Tversky (1991), Tversky & Kahneman (1992), Fox & Tversky (1995), Yates, Lee & Bush (1997) and Daniel, Hirshleifer & Subrahmanyam (1998). Overconfidence in financial markets is usually defined as an overestimation of one's knowledge, experience and/or accuracy of forecasting private information, or the skills of identifying better investment opportunities as compared to other participants of financial markets. Some anomalies found on the financial markets, which

previously could not be explained using the conventional economic and finance theories, were effectively accounted once investors' overconfidence was assumed.

Its application to the field of financial decision making of investors trading on financial market developed recently and still remains a growing field of study across the world, especially in emerging financial markets like Pakistan. Only a handful of recent studies regarding investor behavior and its financial decision making are available in Pakistan e.g. Ahmed, Ahmad & Khan (2011), Zaidi, & Tauni (2012), Ali & Rehman (2013) and Sindhu & Waris (2014).

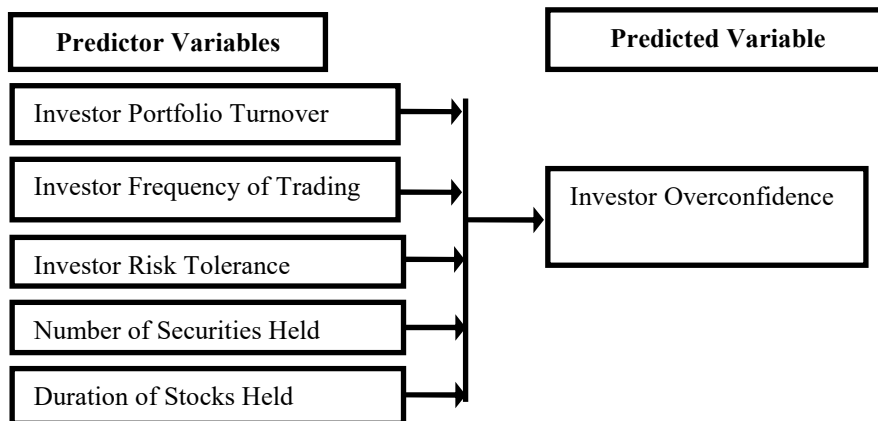
In this study an effort is made to link overconfidence to separate sets of predictor variables other than personality. The area of behavioral finance research is relatively new in Pakistan and therefore a gap exists between Pakistani financial markets and other developed financial markets of the world. Bridging this geographical gap is also a contribution to the current body of knowledge available on behavioral finance.

Research Hypotheses

Based on the literature the following hypotheses are developed:

- H₁: Investors' portfolio turnover is a significant predictor of their overconfidence.
- H₂: Investors' frequency of trading is a significant predictor of their overconfidence.
- H₃: Investors' risk tolerance is a significant predictor of their overconfidence.
- H₄: Investors' portfolio diversification (Number of Securities Held) is a significant predictor of their overconfidence.
- H₅: Investors' duration of stocks held (time horizon of investment) is a significant predictor of their overconfidence

Theoretical Framework of the Investor's Overconfidence Model



Population and Sample Size

There are 228,000 Unique Identification Numbers (UIN) registered with the National Clearing Company Pakistan Limited. But the overall population is further subdivided to Individual, Corporate Company, Corporate/Individual Broker, Funds/Others and Foreign Individuals. The current study only focuses on the behavior of individual investors in Pakistani financial markets therefore the relevant population is the individual clients which are 209,998 in total (News Letter, December 2013 Edition).

A sample of 350 investors is selected for this study. This sample size is well above the required sample size suggested by Green (1991) and is in the “very good” category of Comfrey & Lee (1992). The sample size is also appropriate based on the findings of Maxwell (2000) and Kelley & Maxwell (2003).

Data

Data are directly collected from the investors trading in KSE. 350 questionnaires are distributed to investors keeping in view the non response rate of (Welch & Barlau, 2013). Efforts are made to ensure that questionnaires are properly filled and returned back. 229 correctly filled questionnaires are received resulting in a response rate of 65.43%. The response rate for this study is well above the acceptable range in the field of behavioral and social science studies using survey method (Baruch, 1999)

Data Analysis Methods

To empirically test the hypotheses of the model multiple linear regressions is used. The following regression equation is estimated using the data collected through survey questionnaire.

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n + \epsilon_i \dots\dots\dots \text{Equation \# 1}$$

Before testing the hypotheses of the research, the assumptions of the regression models are also tested. Validity, reliability, linearity, homoscedasticity, multicollinearity, autocorrelation and normal distribution of the residuals statistics are in the acceptable range using different tests suggested by historical research. The methodology is based on the best practices used in quantitative research across the world by researchers.

Results and Findings

Reliability of Research Instrument

According to Carmines & Zeller (1979) the reliability of a research instrument concerns the extent to which the instrument yields the same

results on repeated trials. Willmott & Nuttall (1975) stress the point that the researcher in the social sciences and humanities should determine the reliability of the data gathering instrument to be used in the research surveys. The most widely used method for estimating the reliability of research instrument is Cronbach's alpha.

Table 1: Cronbach's Alpha statistics for Investor Overconfidence Model

S. No.	Variable	Cronbach's Alpha	No. of Items
1.	Investor Portfolio Turnover	0.64	5
2.	Investor Frequency of Trading	0.65	5
3.	Investor Risk Tolerance	0.64	6
4.	No. of Different Securities Held	0.76	8
5.	Time Duration of Securities Held	0.71	6
6.	Investor Overconfidence	0.77	8
7.	Investor Overconfidence Model Overall	0.78	38

Table 1 shows the values for Cronbach's alpha for investor overconfidence questionnaire. For all the items the values for Cronbach's alpha are above 0.6 with a minimum value of 0.64 for investor portfolio turnover and a maximum value of 0.77 for investor overconfidence. The Cronbach's value for the overall model of investor overconfidence instrument is 0.78. George & Mallery (2003) provide a rule of thumb for the acceptable range of Cronbach's alpha where a value below 0.5 is unacceptable while values above 0.5 to above 0.9 are in the acceptable range, classified into categories ranging from weak to excellent.

Empirical Hypotheses Testing

Table 2 reports the value of regression coefficients with their standard errors, t-values, and p-values. The bottom part of the table reports the values of R, R^2 , adjusted R^2 , Durbin-Watson value, F-value and F-significance value. The coefficient of determination for the model is 0.309 which shows that the five predictor variables explain around 31 percent variation in investor overconfidence. The value of Durbin-Watson statistics for the model is 1.890 which is also in the acceptable range of 1.5 to 2.5. The F-value of the model is 19.909 as reported in the table, which is statistically significant at a 0.01 level of significance. This shows the overall model fitness of investor overconfidence with all five predictor variables.

Table 2: Regression results of investor overconfidence model

Coefficients ^a				
Model	Unstandardized Coefficients		t-value	Sig.
	B	Std. Error		
(Constant)	.504	.377	1.336	.183
Investor Portfolio Turnover	.180	.055	3.286	.001
Investor Frequency of Trading	.296	.055	5.400	.000
Investor Risk Tolerance	.245	.065	3.768	.000
Investor Portfolio Diversification	.027	.054	.496	.620
Duration of Stocks Held	.107	.060	1.796	.074
R	.556	R ²	.309	Adj.R ²
Durbin-Watson	1.890	F-value	19.909	F-sig.

a. Dependent Variable: Investor Overconfidence

Table 2 also reports the regression coefficients for all five predictor variables with investor overconfidence. The results of the multiple linear regression model support the first three hypotheses at a statistical significance level of 0.01. The fifth hypothesis is supported at 0.1 level of statistical significance which is not a very common significance level to reject the null hypothesis but with large sample this is also considered an acceptable level of significance. For investor portfolio diversification statistical support is not found at any acceptable level of significance. Therefore the alternate hypothesis for investor portfolio diversification is not accepted.

Discussion and Analysis

The results of the current study support the findings of the historical studies. The positive and statistically significant beta coefficient of multiple linear regression model indicates that investor portfolio turnover is a strong predictor of investor overconfidence. This supports the findings of Gervais & Odean (2001) who state that investors who have a higher portfolio turnover have a higher level of overconfidence. The study findings are in line with the findings of Scheinkman & Xiong (2003), Oh, Parwada & Walter (2004), Statman, Thorley & Vorkink (2006), Graham, Harvey & Huang (2009), Glaser (2010), Trinugroho & Sembel (2011) and Li, Peifei, Weiqiang, & Hongbo (2013).

The positive and statistically significant beta coefficient of investor frequency of trading is a strong predictor of investor overconfidence. This confirms the findings of Konana, Gu, Kumar & Raghunathan (2010), Trinugroho & Sembel (2011), Li, Peifei, Weiqiang, & Hongbo (2013), Scheinkman & Xiong (2003) and Hsu & Shiu (2010).

The results and findings of the current study also support the significant impact of investor risk tolerance on overconfidence. The

positive and statistically significant beta coefficient of multiple linear regression models indicates that investor risk tolerance is a strong predictor of investor overconfidence.

In the current study beta coefficient of investor portfolio diversification is statistically insignificant. Therefore the results and findings of the current study do not support any of the historical views regarding investor portfolio diversification. The possible reason for this result may be the inability of the research instrument to separate the domestic diversification from global diversification.

Lastly, the findings of this study provide an empirical support to the notion that shorter duration of stocks held by investors indicates a higher overconfident behavior having a p-value of 0.074 which is statistically significant at a 0.10 level of significance. The relative weaker impact of duration of stocks held on investor overconfidence may be the result of the possible higher correlation of duration of stocks held with investor portfolio turnover and/or investor frequency of trading. Since these two variables are stronger predictors of investor overconfidence (as shown in the multiple regression table) therefore this may have suppressed the beta coefficient of duration of stocks held as part of a multiple linear regression model.

Overall the results of the investor overconfidence model are in accordance with the historical research. The results support the alternate hypotheses of the study as part of the multiple linear regression model except investor portfolio diversification. Further research is needed to clarify this phenomenon.

Conclusion

This study has examined the investor overconfidence model. Based on the results of the investor overconfidence model, it is concluded that investor portfolio turnover, investor frequency of trading, investor risk tolerance and investor duration of stocks held are statistically significant predictors of investor overconfidence in KSE. But the beta coefficient of investor portfolio diversification is statistically insignificant. Investors who exhibit higher portfolio turnover are displaying more overconfidence. Similarly, investor frequency of trading is a statistically significant predictor of investor overconfidence. Higher trading frequency is an indication of investor overconfidence. Investor risk tolerance is also a statistically significant predictor of investor overconfidence. Lastly, investor duration of stocks held is a statistically significant predictor of investor overconfidence but its beta coefficient is only statistically significant at a 0.1 level significance. The beta coefficients of investor portfolio diversification are statistically insignificant at any acceptable level of statistical significance. Overall the beta coefficients of the four, out of five, predictor variables verify the

alternate hypotheses. The signs are found in accordance as hypothesized based on the historical research and the theoretical understanding of investor overconfidence.

Future Research Directions

Since behavioral finance research is a relatively new area of research, especially in Pakistani financial markets, therefore much work is still to be done before coming up with credible conclusions and recommendations. The first possible future direction of research may be to verify the findings of this study with real account data of investors. Real account data may provide a more complete picture of investment decisions and therefore justify the findings from a different perspective.

Another area of future research may be to carry out a similar study using online investors as a sample. A large number of investors trading in Pakistani financial markets are moving to online trading. Historical research shows that online investors are more exposed to overconfidence therefore it is important to study their behavior.

The current study is solely focused on individual investors whereas a large amount of trading activities is carried out by institutional investors. Therefore, in future the behavior of institutional investors may be studied and the differences in the results of the two groups of investor may be analyzed. Lastly, a comparison of domestic and foreign investors' behavioral biases is also possible. This may also test the general hypothesis that Asian investors are more overconfident than their European and American counterparts.

References

- Ahmed, N., Ahmad, Z. & Khan, S. K., (2011) Behavioral Finance: Shaping the Decisions of Small Investors of Lahore Stock Exchange. *Interdisciplinary Journal of Research in Business* 1(2). pp. 38-43.
- Akbar, M. & Baig, H. H. (2010) Reaction of Stock Prices to Dividend Announcements and Market Efficiency in Pakistan. *The Lahore Journal of Economics* 15(1). pp. 103-125.
- Ali, I., & Rehman, K. U. (2013) Stock Selection Behavior of Individual Equity Investors' in Pakistan. *Middle East Journal of Scientific Research* 15(9). pp. 1295-1300.
- Arshad, I. A., Rani, H. & Shaikh, A. W. (2012) Volatility Modeling of Karachi Stock Exchange. *Sindh Univ. Res. Jour. (Sci. Ser.)*, 44(1). pp.125-1130.
- Barberis, N. & Thaler, R. H. (2003) A Survey Of Behavioral Finance. *Handbook of the Economics of Finance*, G.M. Constantinides, M. Harris & R. Stulz, (Eds.). Amsterdam: North Holland.
- Baruch, Y. (1999) Response rate in academic studies-A comparative analysis. *Human relations* 52(4). pp. 421-438.
- Carmines, E. G., & Zeller, R. A. (1979) *Reliability and validity assessment* (Vol. 17). Sage publications.
- Comfrey, A. L., & Lee, H. B. (1992) *A First Course in Factor Analysis*. New Jersey: Lawrence Erlbaum Associates.
- Daniel, K., Hirshleifer, D., & Subrahmanyam, A. (1998) Investor psychology and security market under-and overreactions. *The Journal of Finance* 53(6). pp. 1839-1885.
- Fama, E. F. & French, K. R. (1988) Permanent and temporary components of stock prices. *The Journal of Political Economy* 96(2) Permanent and temporary components of stock prices. *The Journal of Political Economy* Permanent and temporary components of stock prices. *The Journal of Political Economy* 96(2). pp. 246-273.
- Fama, E. F. & French, K. R. (1989) Business Conditions and Expected Returns on Stocks and Bonds. *Journal of Financial Economics* 25(1). pp. 23-49.
- Fama, E. F. (1970) Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance* 25(2). pp. 383-417.
- Fama, E. F. (1998) Market efficiency, long-term returns, and behavioral finance. *Journal of financial economics* 49(3). pp. 283-306
- Fox, C. R., & Tversky, A. (1995) Ambiguity aversion and comparative ignorance. *The Quarterly Journal of Economics* 110(3). pp. 585-603.

- Friedman, M. (1953) The case for flexible exchange rates. In: *Essays in Positive Economics*. Chicago: University of Chicago Press. pp. 157–203.
- Gabaix, X., & Laibson, D. (2000) A boundedly rational decision algorithm. *American Economic Review* 90(2). pp. 433–438.
- George, D., & Mallery, P. (2003) *SPSS for Windows step by step: A simple guide and reference*. 11.0 update (4th ed.). Boston: Allyn & Bacon.
- Gervais, S., & Odean, T. (2001) Learning to be overconfident. *Review of Financial studies* 14(1). pp. 1–27.
- Glaser, M. (2010) Online broker investors: Demographic information, investment strategy, portfolio positions, and trading activity. Available at: https://ub-madoc.bib.uni-mannheim.de/2768/1/dp03_18.pdf
- Glaser, M., & Weber, M. (2009) Which past returns affect trading volume? *Journal of Financial Markets* 12(1). pp. 1–31.
- Graham, J. R., Harvey, C. R., & Huang, H. (2009) Investor competence, trading frequency, and home bias. *Management Science* 55(7). pp. 1094–1106.
- Green, S. B. (1991) How many subjects does it take to do a regression analysis. *Multivariate behavioral research* 26(3). pp. 499–510.
- Gul, F. (1991) A Theory of Disappointment Aversion. *Econometrica*. 59(3). pp. 667–686.
- Haque, N. (1997) Financial market Reform in Pakistan. *The Pakistan Development Review* 36(4). pp. 839–854.
- Heath, C., & Tversky, A. (1991) Preference and belief: ambiguity and competence in choice under uncertainty. *Journal of Risk and Uncertainty*. 4. pp. 5–28.
- Jensen, M. C. (1978) Some anomalous evidence regarding market efficiency. *Journal of financial economics* 6(2). pp. 95–101.
- Kahneman, D. & Tversky, A. (1974) Judgment under uncertainty: heuristics and biases. *Science* 185(4157). pp. 1124–1131.
- Kahneman, D. & Tversky, A. (1979) Prospect Theory: An Analysis of Decision under Risk. *Econometrica* 47(2). pp. 263–292.
- Kahneman, D. (1973) *Attention and Effort*. Englewood Cliffs, NJ: Prentice-Hall.
- Kanasro, H. A., Jalbani, A. A. & Junejo, M. A. (2009) Stock Market Liquidity: A Case Study of KSE. *Pakistan Journal of Commerce and Social Sciences* 3. pp. 25–34.
- Kelley, K., & Maxwell, S. E. (2003) Sample size for multiple regression: obtaining regression coefficients that are accurate, not simply significant. *Psychological methods* 8(3). pp. 305.
- Koutmos, G. & Saidi, R., (2002) Positive feedback trading in emerging capital markets. *Applied Financial Economics* 11. pp. 291–297.

- Li, L., Peifei, H., Weiqiang, Z., & Hongbo, S. (2013) The Study on Overconfidence and Overtrading of Chinese Individual Investors. *Review of Investment Studies* 8. pp. 003.
- Mahajan, S. & Singh, B. (2008) An Empirical Analysis of Stock Price-Volume Relationship in Indian Stock Market. *The Journal of Business Perspective* 12(3). pp. 1-13.
- Mahmood, F., Raheman, A. & Ali, N. (2012) Efficiency of KSE in Terms of Absorbing Company Reports Effect. *American Journal of Scientific Research* 51. pp. 69-75.
- Malkiel, B. G. (2003) The Efficient Market Hypothesis and Its Critics. *Journal of Economic Perspectives* 17(1). pp. 59-82.
- Markowitz, H. M. (1952) The Utility of Wealth. *Journal of Political Economy*, 60. pp. 151-158.
- Maxwell, S. E. (2000) Sample size and multiple regression analysis. *Psychological methods* 5(4). pp. 434.
- Menkhoff, L., Schmidt, U., & Brozynski, T. (2006) The impact of experience on risk taking, overconfidence, and herding of fund managers: Complementary survey evidence. *European Economic Review* 50(7). pp. 1753-1766.
- Mohammad, S. D. & Hussain, A. (2011) The Dynamic Linkages of Pakistani and Global Stock Markets: Evidence from KSE. *Pakistan Journal of Commerce and Social Sciences* 5(2). pp. 233-242.
- Oh, N. Y., Parwada, J. T., & Walter, T. S. (2004) *Online investors' trading behaviour and performance: Evidence from the Korean equity market*. University of New South Wales, Australia.
- Park, J., Konana, P., Gu, B., Kumar, A., & Raghunathan, R. (2010) Confirmation bias, overconfidence, and investment performance: Evidence from stock message boards. *McCombs Research Paper Series No. IROM-07-10*.
- Savage, L. J. (1954) *The Foundations of Statistics*. New York: Wiley.
- Scheinkman, J. A., & Xiong, W. (2003) Overconfidence and speculative bubbles. *Journal of political Economy* 111(6). pp. 1183-1220.
- Shleifer, A. & Vishny, R. W. (1997) The Limits of Arbitrage. *The Journal of Finance* 52(1). pp. 35-55.
- Simon, H. A. (1955) A behavioral model of rational choice. *The Quarterly Journal of Economics* 69(1). pp. 99-118.
- Simon, H. A. (1957). *Models of man*. New York: Wiley and Sons.
- Simon, H. A. (1959). Theories of decision-making in economics and behavioral science. *The American Economic Review* 49(3). pp. 253-283.
- Sindhu, M. I., & Waris, F. (2014) Overconfidence and turnover: Evidence from the KSE. *European Journal of Business and Management* 6(7). pp. 128-135.

- Skala, D. (2008) Overconfidence in Psychology and Finance – an Interdisciplinary Literature Review. *Bank i Kredyt* (4). pp. 33-50.
- Statman, M., Thorley, S. & Vorkink, K. (2006) Investor Overconfidence and Trading Volume. *The Review of Financial Studies* 19(4). pp. 1531-1565.
- Trinugroho, I., & Sembel, R. (2011) Overconfidence and Excessive Trading Behavior: An Experimental Study. *International Journal of Business & Management* 6(7). pp. 147-152
- Tversky, A., & Kahneman, D. (1973) Availability: A heuristic for judging frequency and probability. *Cognitive psychology* 5(2). . pp. 207-232.
- Tversky, A. & Kahneman, D. (1992) Advances in Prospect Theory: Cumulative Representation of Uncertainty. *Journal of Risk and Uncertainty* 5. pp. 297-323.
- Von Neumann, J., & Morgenstern, O. (1944) *Theory of Games and Economic Behavior*. Princeton University Press.
- Welch, W. & Barlau, A. (2013) Addressing Survey Nonresponse Issues: Implications for ATE Principal Investigators, Evaluators, and Researchers. *Research report from NSF Grant # 1132099*. Available at: <http://www.colorado.edu/ibs/decaproject/pubs/index.html>
- Willmott, A. S., & Nuttall, D. L. (1975). *The reliability of examination at 16+*. Macmillan.
- Yates, J. F. (1990) *Judgment and decision making*. Englewood Cliffs, NJ: Prentice Hall.
- Yates, J. F., Lee, J. W. & Bush, J. G. (1997) General knowledge overconfidence: Cross-national variations, response style, and “reality”. *Organizational Behavior and Human Decision Processes* 70(2). pp. 87–94.
- Yu, T., Yong, Z. & Xiao-wo, T. (2004) Feedback Trading and Stock Return Autocorrelations: Empirical Evidence from Shanghai Stock Market. *Journal of Industrial Engineering and Engineering Management* 4. pp. 17-21.
- Zaidi, F. B., & Tauni, M. Z. (2012) Influence of Investor’s Personality Traits and Demographics on Overconfidence Bias. *Institute of Interdisciplinary Business Research* 4(6). pp. 730-746.