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What Matters In Financial Risk Tolerance Level? An Empirical Study In Pakistan

Dr. Syeda Faiza Urooj[1], Dr. Nousheen Zafar[2], Prof Dr. Arshad Hassan[3], Muzammal Ilyas Sindhu[4]

[1]Assistant Professor, Fuuast Univesity, Islamabad Pakistan.
[2]Assistant Accounts Officer, Accountant General of Pakistan.
[3]Dean, Capital University of Science and Technology, Islamabad.
[4]Ph.D. Scholar, Bahria University, Islamabad.

Email: [1]urooj53@yahoo.com, [2]nousheenzafar@hotmail.com, [4]muzammal496@gmail.com

ABSTRACT: ***This study is an effort to investigate the relationship between socioeconomic, demographic factors and the individual's financial risk tolerance level in investment decisions. Various actors like gender, age, income, education, and nature of work of individuals have been assessed to find their financial risk tolerance level in investment decisions. The sample data has been gathered from the individual investors of Karachi Stock Exchange (KSE), Islamabad Stock Exchange (ISE) and Lahore Stock Exchange (LSE) through the questionnaire designed by Dow Jones and Company in 1998. Various research techniques like descriptive statistics, univariate analysis, correlation analysis, and multivariate regression has employed in order to investigate different factors that matter in individuals' financial risk tolerance level. The results reveal that in the case of Pakistan male investors dominate the investment market implying a higher level of financial risk tolerance in men compared to women. Mostly investors possess higher education like graduation and above due to which financial risk tolerance increases with higher qualification. Increase in age results in an increase in the level of investor's financial risk tolerance and increase in the income level of individuals also increases the level of financial risk tolerance of the individuals in investment decisions in the context of Pakistan.***

Keywords: Financial risk, tolerance level

1. INTRODUCTION

Eugene Fama acknowledged Efficient Market Hypothesis presented in the 1960s revolutionized the conceptual domain in traditional finance and provided the grounds to many traditional finance theories. According to the Efficient Market Hypothesis (EMH), it is hard for any investor to find an opportunity to outperform the market as all available information in the market is reflected by stock prices. As the value is fully reflected by security prices, the investor cannot point out underpriced or overpriced securities. Thus, it eliminates the chance of generating extra profit for the investor.
Until the 1990s the theory of efficient market hypothesis was accepted widely. Afterward, behavioral economists began to challenge its validity. They were of the view that markets are far from perfect in terms of processing information. In addition to this, factors like investor

confidence and investor sentiment have to be considered actively while going for any sort of market analysis. This gave birth to another field of finance i-e Behavioral Finance.

The factors related to attitudes regarding financial risk tolerance are important areas of behavioral finance. Behavioral finance believes that human's thoughts, perceptions, traits, and emotions affect all its decisions of investment. Shiller (2000) is one of the strong proponents of the idea that stock market is administrated by all the new information coming to the market and thus hits the investor minds and perception directly within no time.

It is still a debatable issue for psychologists and economists to find out what mainly constitute the financial risk tolerance level of people? However, psychologists have the opinion that individuals' choices are basically designed and defined by some unique factors which are pertinent to decision settings. While the economists are of the view that there exists some kind of individual-specific mechanism that plays an important part in making decisions regarding financial matters (Harlow and Keith, 1990).

Behaviorists that there exists some kind of a relationship between personality type and investment decisions. The analysis of personalities which were involved with high-level portfolio risk-taking behaviors revealed that they had higher negative emotions and more risk-taking propensity, along with greater openness to experience the situations. It was also revealed that investors who were more extrovert expressed lower propensity of trade (Robert et'al, 2006).

Financial and investment decisions of individuals are significantly affected by the factor of risk that also affects individuals' behavior of economic decisions but also nourishes an attitude of avoiding high risky decisions. (Yang and Qiu, 2005, Allen et'al, 2007). The investor can only assess the expected return when he is well aware of a level of financial risk and its probability to occur. Therefore, investment decisions can be best understood while one has good knowledge of sources and different factors that can influence level
risk. There are many psychological, demographic and individual attributes that contribute to financial and investment decisions (Ritter, 2003). Financial advisors assess this financial risk tolerance level using questionnaires and generate financial risk tolerance score which identifies the financial risk tolerance category of investor (Riccardi, 2008).

Demographic characteristics greatly impact an individual's investment decision and his/her financial risk tolerance level. There have been research-proven facts about the existence of a well-built relationship between risks taking behavior and demographic characteristics. In Bahrain, Al-Ajmi (2008) used demographic characteristics such as gender, age, marital status, financial knowledge and level of education while testing prevalent factors behind an individual's financial risk tolerance level.

A number of investment decisions may get hampered by risk tolerance. No investor can be able to achieve its financial objectives without considering his ability to accept probable losses associated with an investment (Trone, Allbright, and Taylor, 1996). Demographic characteristics are not the only possible factors behind risk-bearing attitudes. In addition to such characteristics, there might exist certain factors that affect the risk attitudes. In case of uncertainty, crisis situation and unstable market the risk perception of stocks and investment decisions of investors may change (Hudomiet, Kézdi, and Willis, 2011). It is of an utmost need to have the better understanding of individuals' attitudes regarding investment and their aggregate behaviors because these have an enormous impact on both macroeconomic performances (Korniotis and Kumar, 2011) and stock prices (Kumar and Lee, 2006).

Various demographic and socioeconomic factors have been widely highlighted by researchers as matters of financial risk tolerance level of investors. These factors contain a huge list including factors like marital status, gender, age, income, academic qualification, profession, knowledge, and expectations (Roszkowski, 1996; Grable & Joo, 1997; Grable &

Lytton, 1998). Some of the key demographics that are matters in this study are mentioned as follows.

Gender Factor

Gender is the most widely discussed factor while determining business decisions and risk attitude. It is considered the third most important factor to determine individual risk tolerance level and investment style (Bajtelsmit and Bernasek, 1996). A number of studies have found that women are more sensitive, less excited, less confident, have fewer leadership qualities, risk-averse and easy to persuade. All these behaviors refrain them to invest aggressively in equities proving them risk-averse (Jianakoplos and Barnesek, 1998).

Education Factor

Individual's education level plays a vital role in financial risk tolerance level while taking investment decisions in financial markets. Education here refers to the professional qualification. An investor with high professional qualification can easily assess the security returns and associated risk and thus can better decide whether to invest or not. Normally the investors with only high school education tend to invest in only fixed income portfolios which have less risk associated with them (Schooley and Worden, 1999). Both the Investors' understanding of financial market dynamics and his earning capability helps in determining his financial risk tolerance level.

Age Factor

Human aptitude and thought process change with the age. Thus investment decisions at each age group also change accordingly. Lewellen et al (1977) held that investment decision and investment styles are most significantly affected by the age group of individual's investor. Studies have documented that aged people are less likely to assume risk as compared to the young investors given the same market dynamics. Old age people do not assume the high risk for high return rather they prefer to hold investments which give them fixed returns in the shorter time period. This increases the investment in fixed income securities such as T. Bills at a later age (Bodie et al, 1992).

Wealth/ Income Level Factor

Grable and Lytton (1999) documented the wealth or income of an investor as one of the significant determinants of investors' financial risk tolerance. People belonging to higher income group are more tend to invest in equity shares as compared to the low-income investors, the reason being high margins to bear the risk. There exist the linkage between income and assets to levels of financial risk tolerance. Individuals having a higher level of income along with a grand total of net assets were inclined to take more risks in terms of finances, and vice versa (Cicchetti and Dubin, 1994; Riley and Chow, 1992; Shaw, 1996).
Another view is that people with more financial assets are more conservative while investing. They might want to save their assets or they are satisfied with their existing level of income. Bowman (1982) found a negative relationship between wealth and risk tolerance level.

Nature of Work Factor

Nature of job that a person is performing also contributes to forming his perceptions and decisions. Usually, people doing some fixed-income jobs or more specifically government jobs have limited income which they have to manage for their daily living as well as savings. People belonging to this class hardly think about the investments however if they have to

invest, their preference is less risky assets or fixed income securities. Thus they are less likely to invest in stocks. However, another contradictory point of view is that as such people are frustrated due to their hand to mouth conditions and want to have quick gains to change their life, they sometimes be ready to assume even high risk to have high returns.
Business class, on the other hand, is relatively relaxing in their day to day expenses and also has handsome savings that they can easily invest. Since their income is high, they have more power to bear even high-risk level and thus they can frequently invest in equities. However, in business profits vary from time to time and risk-averse businessmen are more prone to have savings to back its business operations in bad times rather than investing in equities.

Significance of Study

This study is an investigation of possible existing linkages between demographic, socioeconomic, attitudinal characteristics of individuals and his financial risk tolerance level. Attitudes are formed on basis of past experiences. Prospect theory of Behavioral Finance implied that people make decisions on behalf of their past experiences and perceptions. Thus it is important to study what are the human-related aspects which could affect its investment decision.
Investigation of financial risk tolerance level of individual investor and the underlying factors which could play a part in decision making of the investor based on their risk attitude can help to understand the behavior of financial markets (Tarashev et'al, 2003). Risk attitude of investor may also explain the swings in asset pricing. Investors ready to take more risk can bring an upturn to the market and vice versa. Pakistan is a developing country with terrible socio-political and economic conditions. Thus this study discusses factors that contribute to the risk attitude of individual investors may help in developing a better framework to understand the fluctuation of asset prices. The study has also helped financial analysts, brokers and financial managers to understand their client's financial risk tolerance level. However, they can also enhance their clients or customers financial risk tolerance level by considering various demographic, socioeconomic and individual's characteristics.

2. LITERATURE REVIEW

This section documents different studies in favor of the demographic and socio-economic factors affecting the risk tolerance level of investor.

Factors affecting individual's financial risk tolerance level

Grable and Joo (1999) examined a wide range of demographic and socio-economic factors as a predictor of financial risk tolerance level of investors. These factors include age, education, financial know-how, income level, home ownership, number of dependents at home, financial solvency, and ethical background. The study revealed age being the most insignificant factor in determining risk tolerance. Rest all of the factors were found having a significant impact over financial risk tolerance. However, among these factors, the most significant impact was found for education level, financial knowledge, and income. All these factors showed a direct relationship with financial risk tolerance.
Horvath and Zuckerman (1993) highlighted the linkage between one's psychological makeup and hir/her risk tolerance level. They identified that one's biological, demographic and socioeconomic characteristics put a greater effect on one's financial decisions especially with respect to risk bearing attitude. A social scientist James (2002) carried research in which he surveyed 795 employees of different colleges and universities. His core objective was to find demographic and dispositional factors which may contribute to behaviors of individual' regarding investment risk-taking and making financial decisions. Results showed that factors

like income, age, retirement plan, self-efficacy, knowledge of investment and propensity of risk-taking are major factors for particular investment attitude.
Grable and Joo (1999, 2000) presented the idea that factors affecting financial risk tolerance of investors may be different at each level of risk tolerance. Thus a precise and organized examination of socio-economic and demographic factors along with an assessment of behavioral factors (including both attitudinal and psychological factors) should be conducted to differentiate between each level of risk tolerance.

Gender Factor

Women are widely considered risk-averse as compared to men (Jianakoplos and Barnesek, 1998; Hallahan, Faff and Mckenzie, 2004; Watson and Mcnaughton, 2007) and Men are believed to have more risk tolerance as compared to women (Guiso et'al, 1996; Bajtelsmit and Ven Derhei, 1997; Jianakoplos and Bernasek, 1998; Hariharan, hapman and Domain, 2000; Hartog et al, 2002). Johnson and Powell (1994) held that gender trait difference plays a dominating role while making management decisions concerning risk. A contrary point of view is that there does not exist any difference in man and woman traits and thus their investment attitude and style also does not differ (Powell, 1990). Some researchers like Sexton and Bowman-Upton (1990) have also documented similarities in personalities of Male and female entrepreneurs.
Clark and Strauss (2008) discussed risk tolerance in different classes. According to them, women were mostly found having a risk-averse attitude than men. As per age categorization, it was found that old people had more risk-averse behavior as compared to young people. In terms of finances, stable and well-earning people are more willing to invest in risky assets whereas poor or financially distressed people hesitate to do so. Hinz et al. (1997) analyzed government Thrift saving plans and found that 65% of women tend to invest in fixed income securities whereas only 28% of women tend to invest in equities. On the other hand 52% men invested in fixed income securities and 45% of men invested in equities. Although the higher ratio of men invested in fixed income securities still this percentage is lesser than that of women which helps in drawing the conclusion the women are less inclined towards risky assets.
Another huge analytical study on the basis of psychology literature is done by Byrnes et al (1999). They summarized 150 studies which examined differences in risk-taking attitudes between both sexes: men and women. According to them generally, women expressed an attitude of less risk-taking than men. Slovic (1966) explains that children have to face a lot of pressure during their early childhood to behave within their cultural limits. They are enforced with certain gender roles which they have played at any cost. All these results lower propensity among women regarding taking risks. Byrnes (1998) believes that the reluctance of women for indulging in risky behavior is deeply linked to restrictive parental practices regarding women. Powell and Ansic (1997) conducted an experiment by choosing the students of a business school as their subject of study. It was a conscious effort not to associate the gender bias with the effect of non-specialist background within the sample. Their results revealed that females did not assume much risk rather adopted different strategies to invest to manage risk. However, these strategies also fail to significantly improve their performance in overall investment.

Education Factor

Education plays vital effects on the risk tolerance level of the investor (Terrence et'al, 2004). However, it is also believed that an individual's general academic qualification is less important than his financial knowledge. One's financial knowledge influences one's risk-

taking behavior. People more equipped with the professional qualification or any higher level education are more likely to assess the market conditions in a better way and thus are ready to assume the risk.

An investor equipped with more technical tools to calculate and assess the market dynamics, business environment, economic conditions, firm performance etc would be more confident about his decisions and thus would take more bare decisions to invest in bonds and securities (Haliassos and Bertaut, 1995; Guiso et al, 2003; Qureshi et al. 2020). On the other hand, simply high school qualified investor or the one without any professional qualification would be hesitant to invest in risky securities because he would be either following other's decisions or making decisions without proper assessment of the situation.

Different studies have found risk-taking behavior a result of different factors. Risk-taking behavior and its variability was a combination of education, financial knowledge, income and occupation (Grable, 2000). Education was also proved as a strong factor affecting financial risk tolerance by Grable and Joo (1999). People with high-risk tolerance are more engaged in financial deals which improve their vision and experience. This, in turn, may contribute to enhancing their financial knowledge and help them to take more strong decisions (Ulla.Y, 2000).

Age Factor

Age plays a key part in shaping risk behaviors. There exist a direct relationship between age and risk aversion. Risk aversion increases with an increase in age (Morin and Suarez, 1983) and vice versa. This argument challenges the applicability of constant life-cycle risk aversion hypothesis and that remains no more accepted phenomenon (Hui and Sherman, 1997). Considering other studies done in the same area, it has been revealed that age is not the only factor in determining risk aversion attitude (Grable 2000, Hariharan, Chapman, & Domain, 2000).

Wallach and Kogan (1961) are considered among the pioneers to initiate the idea that there exists some relationship between age of investor and his risk tolerance level. Lewellen et.al (1977) investigated age, income and marital status as the factors affecting risk tolerance. Their results showed that age and income moves in a positive direction with risk tolerance however marital status and risk tolerance is negatively related to each other. Morin and Suarez (1983) found evidence of increased risk aversion with age although the households appear to become less risk-averse as their wealth increases.

The study conducted by Yoo (1994) held that investment pattern or holding and disposing of risky securities keeps on changing throughout the life of an individual. According to him, individuals tend to increase their investment in risky assets throughout their working life but as they get retired, they want to play safe and thus reduce the chances of risk by making safe investments. Sung and Hanna (1996) also found that as long as the people are away from their retirement, some 30 years or more, they are more aggressive and risk taker but as they near the retirement their risk-taking ability decreases.

Although a number of studies have proved the relationship of risk tolerance and age of investor that as age increases people get more risk-averse (Brown, 1990; Palsson, 1996; Bakshi and Chen 1994; Wallach and Kogan, 1961; Grable, 2000) still there are studies who have negated this idea by finding no significant relationship exists between age and ratio of equities in total portfolio (Cutler, 1995; Poterba, 2001), Also Grable and Joo (2000) and (1997), Grable and Lytton (1998), Wang and Hanna (1997) debated that this presumed negative relationship of age and risk tolerance might not necessarily be true.

Malkiel (1990) proposed that a percentage of investment in equities should reduce with the age. According to his suggestion, a 25 years old person should have 70% invested in equities whereas a person who is 70 years old shall have this percentage as only 30%. He also

proposed that risk attitude of investor shall be kept in mind while making investment however he failed to clarify how risk tolerance can be incorporated in portfolio construction.
However, there are different views regarding this age theory. Many studies have found that risk-taking increases with age (Summers et al, 2006) i-e ratio of investment in securities increases with the age. Yoo (1994) found that investors tend to hold more equities in their portfolio until they get retired. After retirement, the number of equities in their portfolio reduced.

Income/Wealth Factor

Income and wealth factor is considered as foremost indicators of risk tolerance (Schooley & Worden, 1999). Income and wealth have the ability to recover the loss as they possess sufficient income. However, this is also mentioned that income level and wealth often correlated with numerous factors e.g age etc.
Income of the individual is also highly affected by the number of its dependents and its marital status. A married person with a family has more financial responsibilities as compared to a single man. Thus with the same level of income, a married person may not be much risk tolerant whereas a single person can easily manage any probable losses and thus is more risk seeking. However the couples in which both the spouse are earning hands do not face this problem and they can be more risk tolerant as compared to other couples (Robert, 2005).
Cohn, Lewellen, Lease, and Schlarbaum (1975) held that financial risk tolerance increases with the wealth and income in hands of the investor. This relationship was then supported by Cicchetti and Dubin (1994), Schooley and Worden (1996), and Shaw (1996). Other than behavioral studies and logic, even economists are of the view that an individual's risk tolerance level depends upon changes in his wealth. Such type of economic studies held that as the income/wealth increases, a typical investor will find his risk premium falling, on a steady way (Ross, 1981).
Where all the studies have been finding out a relationship between risk tolerance and income/wealth level, Roszkowski (1998) commented that results actually measures the risk capacity of the investor. When income increases, the capacity to bear risk also increases and vice versa. Robert (2005) has documented that there is a difference between relative and absolute risk tolerance. It is believed that absolute income invested in securities has a positive relation with risk tolerance but relative risk tolerance is positively related to income or not is still not decided. However, some evidence of this phenomenon has been found by Cohn, Lewellen, Lease & Schlarbaum (1975).
Malkiel (1996) in his study proposed that “The risks you can afford to take depends on your total financial situation, including the types and sources of your income exclusive of investment income”.

Nature of Work Factor

The source of earning to a person counts a lot in determining his income and financial status. Since there exists a direct relationship between income and financial risk tolerance, and nature of work determines the income level, risk tolerance level varies with the nature of work (Roszkowski et al, 1993). People engaged in public sector jobs are not much risk tolerant due to their fixed income and hand to mouth living conditions. On the other hand, people engaged in private sector jobs, or are self-employed or salespersons are more risk tolerant (Leonard, 1995). It has also been found that professionally employed people have higher degrees of the risk tolerance as compared to the people doing non-professional jobs (Grey & Gordon, 1978; Haliassos & Bertaut, 1995; Masters, 1989).

Development of Hypotheses

Since each factor impacts individuals' financial risk tolerance level in a different direction, a separate hypothesis has been formulated for each factor under study.

Gender Factor

The literature reviewed has established that men are more risk taker than women as they do not worry much for their investments. The men are comparatively risk taker as compare women. The women being risk averse take financial decisions as per their financial position. They thoroughly analyze their family conditions and check out whether they are in a position to make a heavy investment? Also, the profit from that investment is their primary consideration. This difference in attitudes of both the genders helps us in formulating our first hypothesis as:

H1: Gender of Investor significantly impacts its financial risk tolerance level.

Education Factor

The level of Individuals' education serves as an indicator of an individual's earning power. It is generally believed that highly qualified people get good jobs and are highly paid in the circle. Investment has also been identified as a function of income of the individual. On the basis of literature found in this regard, we can sufficiently hypothesize that financial risk tolerance level is the function of education and there exists some relationship between these two variables. This gives us our second hypothesis as:

H2: Education level of investor significantly impact its financial risk tolerance level.

Age Factor

Human energies and thought process keep on changing with time. As the person grows old, his priorities in life also change because a general approach develops that now they are short of time in life this approach makes an individual earn from safe sources and they avoid to take more risk and thus prefer to invest in fixed income securities (Bodie and Crane, 1997). All these evidence found in literature makes this study to hypothesize that financial risk tolerance level can also be defined as the function of the age of investor as people of different age groups have different investment and risk-seeking patterns.

H3: Age of individuals has a significant impact on financial risk tolerance level.

Wealth/ Income Level Factor

Some studies found a significant relationship between financial risk tolerance level and Income or wealth of investor. Income is the primary thing that governs the investor attitude as it directly relates to the survival of an individual. A negative relation between wealth and risk tolerance lends further support to Bowman's (1982) proposition that troubled firms prefer and seek risk. As in the case of gender and age, there seems to be a general agreement as to a negative relationship between wealth and risk aversion. The hypothesis to be tested in this study has been formulated as:

H4: Investor's wealth is a significant factor in determining individual financial risk tolerance level.

Nature of Work Factor

Some studies suggested that different working classes have different financial risk tolerance based on their earning level and responsibilities in life. It has been identified in the literature that investors employed in private firms, self-employed, or working as sales marketing persons are not comparatively better paid than public sector employees and thus can tolerate more risk. But another aspect could be that such people have no job security and can be declined any time so they might hesitate to invest inequity rather prefer to hold fixed income securities. Businessmen are relaxed in this regard. Their business is in their hands and they can cover any losses occurred to them in the long run thus they are more risk takers than any other class. This difference is the nature of work and accordingly, the mindsets of the investor from each class give us our last hypothesis as:

H5: Nature of work significantly affects the financial risk tolerance level of Investors.

3. METHODOLOGY

Standard Dow Jones and Company questionnaire used by Jasim Y (2008), with few amendments as per Pakistani context, has been employed for the study. The questionnaire consists of two parts with a total of sixteen questions. The first portion comprises of five questions related to investor's demographic characteristics specifically. The second portion comprises of eleven questions that are concerned with risk attitudes of investors. The main link questions comprising the second part of the questionnaire, first eight questions highlights the investment patterns of investors and remaining three questions points out the investor's risk preference that while making investment how the investor perceived risk. This provides us the basis to measure the financial risk tolerance level of an investor by calculating the respective scores for each individual.

The data sample regions contain Karachi, Islamabad, and Lahore, in order to measure the financial risk tolerance level of individual investor in Pakistan, comprise of the investors actively indulged into investing activities in Karachi Stock Exchange, Islamabad Stock Exchange, and Lahore Stock Exchange. Total 157 questionnaires were circulated through brokerage houses in Karachi Stock Exchange, Islamabad Stock Exchange, and Lahore Stock Exchange as it was not possible to personally approach all the active investors. The Standard Dow Jones and Company questionnaires scale adapted also have used by Jasim Y (2008), with few amendments as per Pakistani context, has been employed for the study in order to investigate the various factors that matter in financial risk tolerance level in the context of Pakistan. Respondents have been asked about their financial risk tolerance level with regard to five main dominant factors; gender, education, age, monthly income and nature of work.

Calculation of Financial Risk Tolerance Level

Questionnaires to measure risk attitude has been designed in a manner that options for each question in the second part of the questionnaire have been ranked according to risk preference, ranging from conservative to aggressive approach. In order to calculate the financial risk tolerance level of investors, the weights of each alternative to the investor have been summed up. On the basis of the aggregate total of preferences, investors have been classified as conservative, moderate or aggressive risk takers according to the scale used by Jasim (2008).

Univariate Analysis

In order to measure the risk tolerance level of investors and to check out the impact of individual investor's demographics on risk tolerance, univariate analysis has been made of each variable. This provided us the individual importance of each variable in assessing the risk tolerance level of investor.

Multivariate Regression Analysis

In order to investigate the five dominant factors; gender, education, age, monthly income and nature of work that matters in individual financial risk tolerance level, multivariate regression analysis has been employed. Multivariate regression analysis has provided the impact of each factor like gender, education age, income and nature of work on investor financial risk tolerance level. The multivariate regression equation used in this regard is as follows:

$$Y = a + \beta 1\ X1 + \beta 2\ X2 + \beta 3\ X3 + \beta 4\ X4 + \beta 5\ X5 + €$$

Where:

β	=	Coefficient of Variable
X1	=	Gender
X2	=	Education
X3	=	Age
X4	=	Monthly Income
X5	=	Nature of Work
€	=	Error term
Y	=	Risk Tolerance Level

Correlation Analysis

Correlation analysis was conducted in order to find the association between an investor's financial risk tolerance level and investor's gender, education, age, income and nature of work. Pearson correlation coefficient has been calculated for this purpose as follows:

$$\rho_{X,Y} = \operatorname{corr}(X,Y) = \frac{\operatorname{cov}(X,Y)}{\sigma_X \sigma_Y} = \frac{E[(X-\mu_X)(Y-\mu_Y)]}{\sigma_X \sigma_Y},$$

4. DATA ANALYSIS

Response Rate of Questionnaires

Total 157 questionnaires distributed in Karachi Stock Exchange, Islamabad Stock Exchange and Lahore Stock Exchange in this study in which 116 questionnaires received back, complete and valid in all respects have been included in this study. The sample size is confined by the obstacles to accessing investors and adverse economic and market conditions. Also, the investors seem reluctant to share their personal details which resulted in less sample size in the research study.

Descriptive statistics

Table I below shows the descriptive statistics of Pakistan for the factors like gender, education, age, income, and nature of work being independent variables and financial risk tolerance level as a dependent variable. The table shows that the highest mean value occurs for the education (among independent variables) i-e 2.3017 whereas the second highest mean value is for income i-e 2.1724. Lowest mean value found is for gender i-s 1.2845 but also the standard error of gender is the lowest among all independent variables i-s 0.0421. Standard errors for income and age are quite close to each other i-e 0.0851 and 0.0828 and are highest and second highest respectively among all. The highest standard deviation (SD) of 0.9163

was observed for monthly income which also has second highest mean i.e. 2.1724. This depicts that there exists a high level of volatility among the responses signify that monthly income play a significant role in making investment decision of some respondents whereas in case of some investors monthly income does not play a significant role.
The highest mean of 2.3017 was observed for education with the SD of 0.5782 which is high but lower than SD for monthly income. The highest value for mean shows that investors perceive education is considered an important factor of the risk tolerance level. The lowest mean value of 1.2845 and standard deviation i-e 0.4531 was observed in case of gender thus highlighting it as a least important factor. Series for financial risk tolerance level (dependent variable) shows the mean value of 16.3362 with a standard error of 0.2816 which is quite higher. The standard deviation of series is also very high i-e 3.0330 which shows the high dispersion exist among the series and mean financial risk tolerance level of investors varies a lot within the given series.

Table 1: Descriptive Statistics

	Gender	**Education**	**Age**	**Income**	**Nature of Work**	**Risk score**
Mean	1.2845	2.3017	2.0690	2.1724	2.1293	16.3362
Standard Error	0.0421	0.0537	0.0828	0.0851	0.0730	0.2816
Median	1	2	2	2	2	16
Standard Deviation	0.4531	0.5782	0.8917	0.9163	0.7861	3.0330
Minimum	1	1	1	1	1	11
Maximum	2	3	4	4	4	24
Count	116	116	116	116	116	116

Univariate Analysis
Univariate analysis is the simplest form of quantitative analysis. This section analyses each variable under study in detail to have a clear picture of the presumed relationship.

Gender
Table 2-A below shows the univariate Analysis for the series of gender for a sample in Pakistan. The figures show that the majority of the investors are men i.e. 83 (71.55%) and 33 (28.245%) are women. The mean value for the financial risk tolerance level of men is 16.46 points, whereas 16.00 points for women. This indicates that although men and women are statistically different but that both have moderate financial risk tolerance. Therefore, we can infer that men are less risk averse investors as compare to women.

Table 2-A: Univariate Analysis for Gender

	F	**%**	**Mean**	**F-stat**
Male	83	70.80	16.46	
Female	33	29.20	16.00	
Total	116	100		1.18

Figure 2-A below again shows the same results for gender in the sample from Pakistan. A graphical comparison of two series for males and females has been made which clearly shows that percentage of men is higher in the sample as compared to women and also the average financial risk tolerance score is higher for the men as compared to women however the difference is very less but still value for male financial risk tolerance level is higher than females i-e 16.46 >16.00.

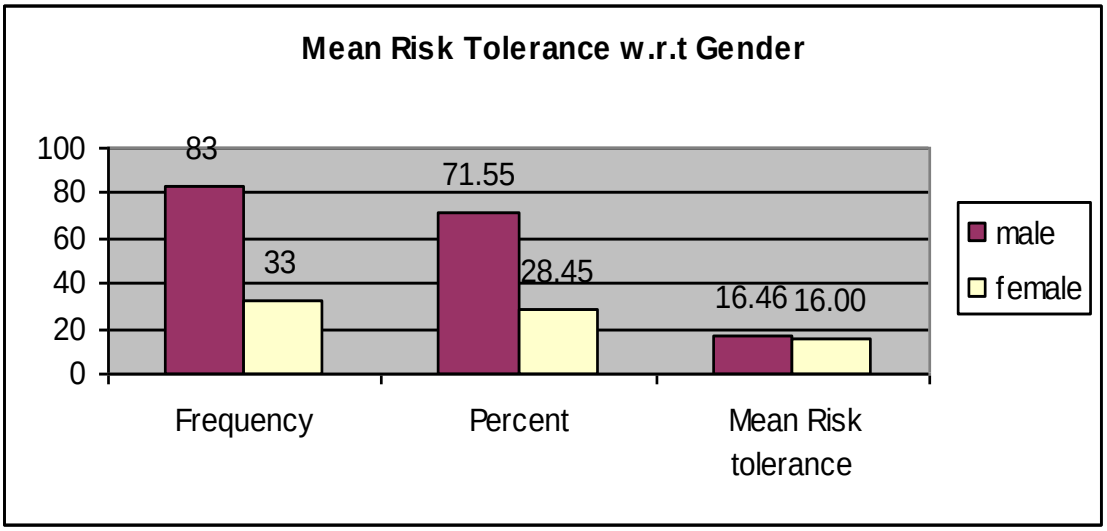

Figure 2-A: Graphical presentation for Gender

The above mention statistics support the notion that risky assets are less likely to hold by women. Generally, in the case of Pakistani society men have all major financial responsibility, therefore in order to fulfill their financial obligation, they make decisions related to investments. Another reason might be that women used to earn less as compare to men in Pakistan as they possess low profile jobs. This leads to the fact that women have less capital to invest. This fact is also supported in (Hartog, Ferrer-I-Carbonell and Jonker, 2002) thus concluded that women are less financial risk tolerant than men.

Education

Table 2-B below shows the univariate Analysis for the series of education in the sample from Pakistan. The figures show that 7 (6.03%) of the investors have gained education till intermediate level 57.76 % are graduates and 36.21% investors have obtained the professional qualification or masters degree. Mean financial risk tolerance for inter, graduate and post-graduate investors are 15.14, 16.07, and 16.05 respectively. These figures indicate that most highly qualified investors are the high financial risk tolerant as we hypothesized.

Table 2-B: Univariate Analysis for Education

	Frequency	**Percent**	**Mean Risk tolerance**	**F-test**
Intermediate	7	6.03	15.14	
Graduate	67	57.76	16.07	
postgraduate/prof. qual	42	36.21	16.95	
Total	116	100		0.79

In this table, it is demonstrated that high qualification persons are more risk taker than lower level educated persons. The financial risk tolerance means for an intermediate investor is 15.14 that is comparatively less than graduate investor i.e. 16.07. The reason for the

difference in the values is that investor with intermediate education is not mature enough and is in a stage to establish his life, that is why he avoids risk-taking in case of investment. The postgraduate degree holder investors having had the highest value for mean financial risk tolerance and the reason behind that is they are settled in lives and have enough knowledge and know-how for the stock market.

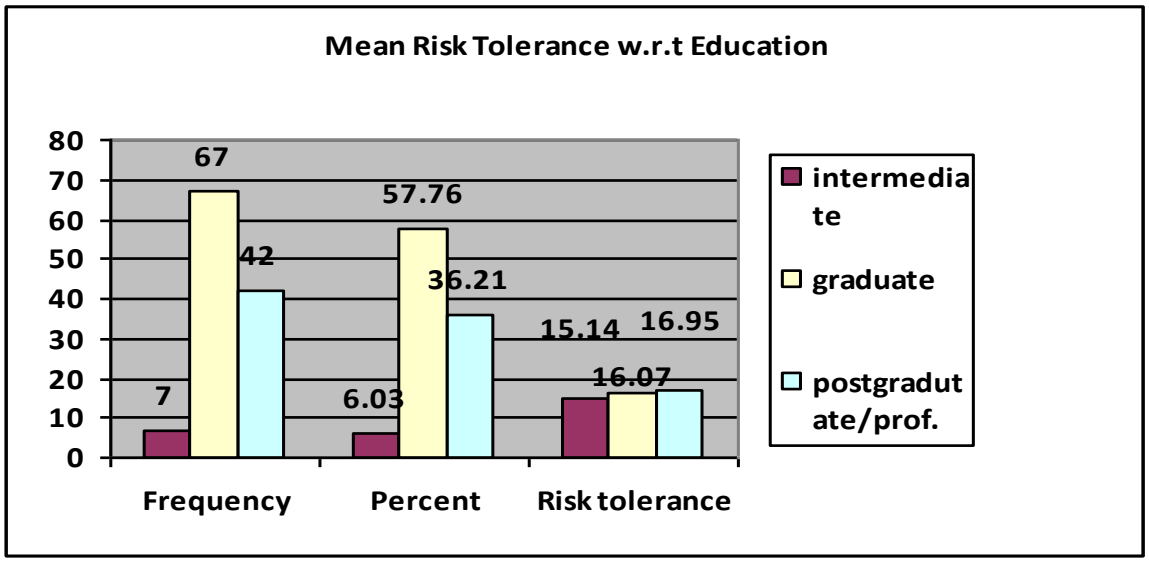

Figure 2-B: Graphical Presentation for Education

These results are not surprising as in the labor market the professional qualifications and university degrees holders are highly valued and are in short supply that makes attractive in the job market for both public and private sectors. As educated persons hardly affect their standard of living that is why losses in the investments will not be as much serious as compare people with less education. In case of losses highly educated investors can compensate them from their income as they hold strong job positions having higher salaries.

Age

Table 2-C shows that investors with age group more than 50 years are financial risk tolerant as compare to investors belonging to any other class. Investors between 40 to 49 years old have a mean value of 15.62 which is the lowest among all classes. Investors between the age group 30 to 39 years are lesser financial risk tolerant as compare to age group between 20 years and 29 years. The second highest mean financial risk tolerance for age between 20-29 years has been found as 16.50 points. These are complex results not giving any clear picture to infer any decision.

Table 2-C: Univariate Analysis for Age

	Frequency	Percent	Risk tolerance	F-test
20years - 29 years	34	29.31	16.50	
30 years- 39years	48	41.38	16.35	
40 years - 49 years	26	22.41	15.62	
50 years and more	8	6.90	17.88	
Total	116	100		0.91

Figure 3-C below shows the same position graphically making it easier to understand the situation. It again shows the mean risk tolerance scores very close to each other. Its only for people more than the age of 50 years that risk tolerance is high. Means as the person grows up he becomes more risk tolerant. These results do not prove our hypothesis however more appropriate results can be seen through regression.

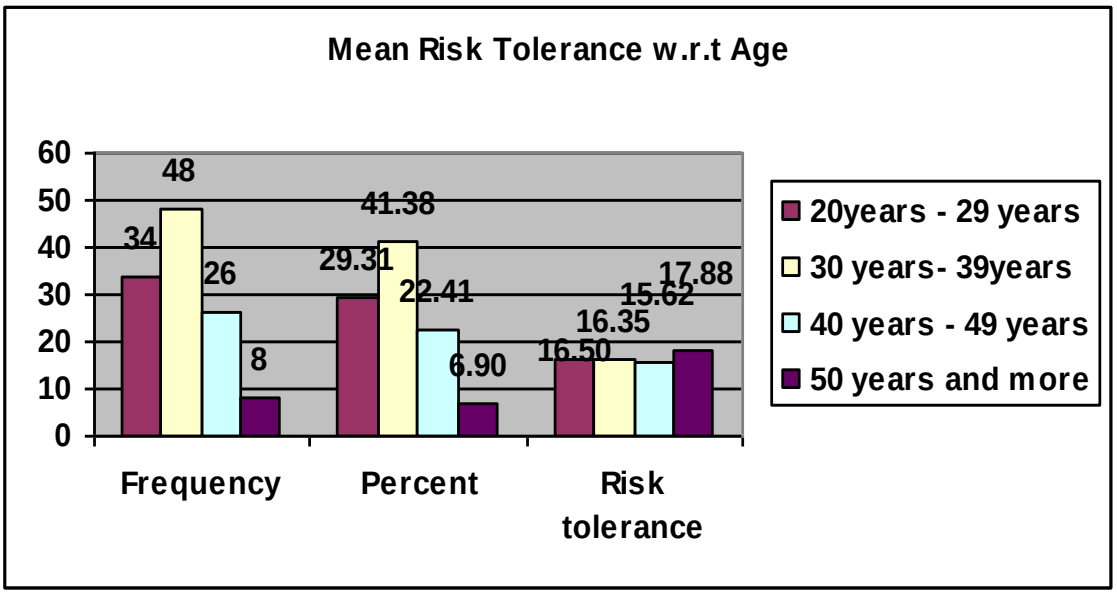

Figure 2-C: Graphical Presentation for Age

The survey results do not show a clear direction for the effect of age on risk tolerance, even though the risk tolerances of each age group are significantly different.

Persons who show more tolerance for risk belong to early working life and are not married, whereas the people who are married and have children had shown the change in attitudes toward risk change thus leading them to less-tolerant. Similarly when people have less responsibility in the case of their children's future and they are relatively secure financially then they have more tolerance toward risk. In our findings, age has complex effects for which more appropriate tools of analysis are required.

Monthly income

In this section, it is demonstrated that people with higher level income convinced toward more risky investment, while people with lower level income convinced toward less risky investments.

Table 2-D: Univariate Analysis for Monthly Income

	Frequency	Percent	Risk tolerance	F-test
less then 20000	29	25.00	15.69	
20000 - 35000	49	42.24	16.27	
36000 - 50000	27	23.28	16.30	
more then 50000	11	9.48	18.45	
Total	116	100		0.89

Figure 2-D below shows that there is no significant difference in the mean risk tolerances of the investors belonging to different earning classes. A very minor difference occurs between people earning 20000 to 35000 and people earning 36000 to 50000 with the mean risk values of 16.27 and 16.30 respectively. The however a major part of the sample is covered by the people who belong to the income group 20000 – 35000 which are shown by the highest frequency and percentage i-e 42 and 42.24% investors in a sample.

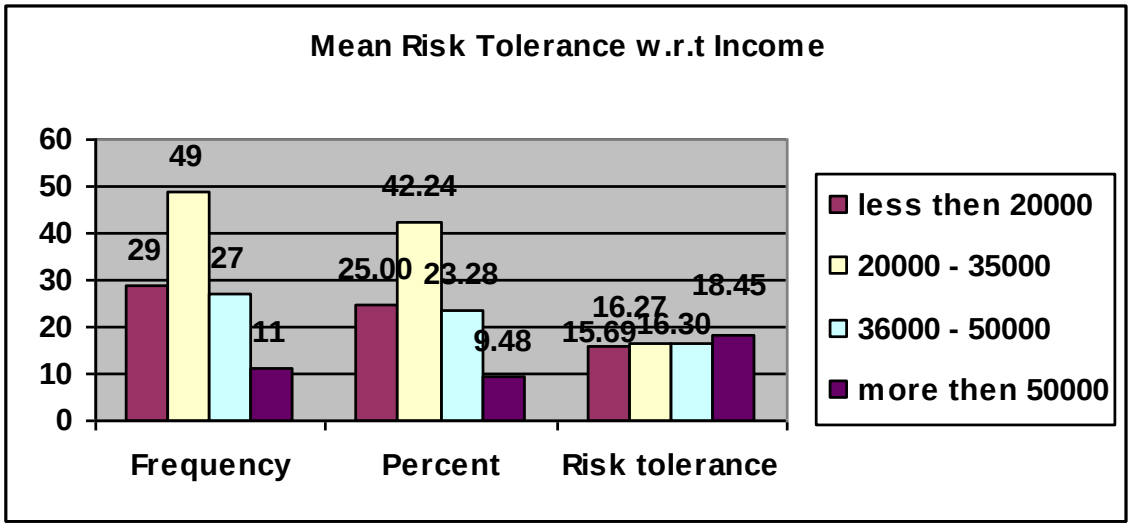

Figure 2-D: Graphical Presentation for Monthly Income

Pakistan is a developing country and people here generally earn just to meet their bread and butter and incomes are also not very high. So these type of results is not surprising in this scenario. Our results are supported by the existing literature that individuals having more wealth are risk-averse and manifest more investment willingness in equities (Clark and Strauss, 2008).

Nature of work

Table 2-E presented below shows that in this study 22(18.97%) investors are related to the public sector, followed with 55 (55.17%) of the private sector, 23 (19.83 %) are self-employed investors and 7(6.03%) are retired officers. This shows that the highest mean risk tolerance was observed for retired officers. This is supported by the fact when are retired they received funds, and thus invest a portion of their funds in stocks. The results presented below also shows that lowest risk tolerance occurs for the investors belonging to the public sector that is 16.02. these results are in accordance to our hypothesis apparently still mote test is required.

Table 2-E: Univariate Analysis for Nature of Work

	Frequency	Percent	Risk tolerance	F-test
public sector	22	18.97	16.02	
private sector	64	55.17	16.23	
self-employed	23	19.83	16.83	
Retired	7	6.03	17.57	
Total	116	100		1.37

Figure 2-E clearly identifies the highest percentage of investors working in the private sector with the highest percentage as well. There is no significant difference in the percentage of investors working in the public sector and investors who are self-employed. The gradual increase among the risk tolerance can also be observed clearly with the highest value for retired persons.

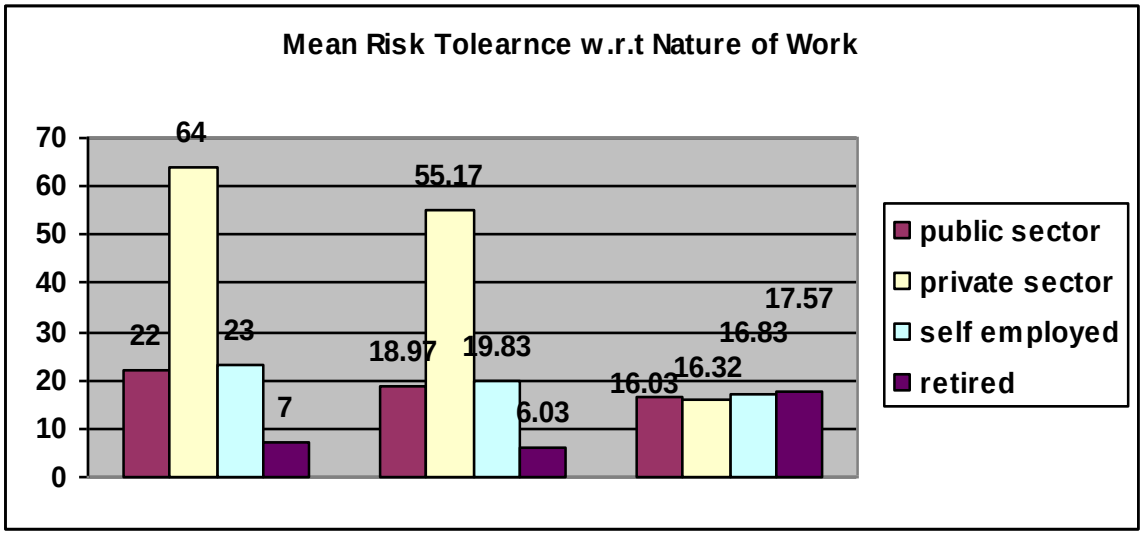

Figure 2-E: Graphical Presentation for Nature of Work

Retired people generally do not have financial responsibilities. At this stage of life their family is settled enough, therefore they are in a position to take risk comparable to private sector having risk tolerance point of 17.57. As in the case of private sector, there exists no job security, therefore people take less risk in this sector. However, in case of public sector and self employed investors take the risk due to job security, and self-employed investors know that the can easily recover the loss.

Correlation Analysis

Table 3 presented below shows the results for correlation analysis between Gender, education, age, income, nature of work and financial risk score in Pakistan. The table depicts that financial risk score is highly correlated with income (r = 0.6011) that means with an increase in income, financial risk tolerance level also increases. Another strong and significant correlation is found between age and income showing that with the increase in age, income level also increases (r = 0.5068). Education and income are also found significantly correlated in the positive direction with r = 0.5800. A weak correlation is found between the nature of work, age, and income. These relationships are found positive but insignificant. Income and gender also show the negative weak correlation with each other.

Table 3: Correlation Analysis

	Gender	**Education**	**Age**	**Income**	**Nature of Work**	**Risk score**
Gender	1					
Education	0.0346	1				
Age	-0.0920	0.0774	1			
Income	-0.2029	0.5800	0.5068	1		
Nature of Work	-0.0798	-0.0483	0.4213	0.3189	1	
Risk score	-0.0702	0.1698	0.0010	0.6011	0.1056	1

Multivariate Regression Analysis

Table 4 shows the significantly positive relationships exist among age, age and nature of work of investors with their financial risk tolerance level. It means that as the increase in education and age as well as improvement in the nature of work, there is also an increase in financial risk tolerance level. It is found that there exists an indirect relationship age and gender with individual financial risk tolerance level. The value of R square is 12 percent, shows that only 12% of the financial risk tolerance level explained by these factors in individuals.

Table 4: Regression analysis

	Coefficients	***t -Stat***
Intercept	13.5627	8.1601*
Gender	-0.2551	-0.4078
Education	0.7907	1.6194**
Age	-0.5848	-1.6391**
Monthly income	0.7195	1.9662**
Nature of work	0.4359	1.1051
R Square		0.1237
Observations		116
F value		2.0105

*significant at 95% level of confidence
**significant at a 90% level of confidence.

This study explained that there are numerous factors on which investment decisions are basing other than, demographics. It is also mentioned in the portion of the literature review that demographic, sociological, psychological perspective affects one's level of financial risk tolerance. These results reasonably provided us the basis to accept the H1, H3, and H4 that Education, age and income, respectively, has significant impacts over the financial risk tolerance levels of the investors. On the other hand, since values of the coefficients for gender and nature of work are not found significant, this study may reject H2 and H5 that difference in genders and nature of work impacts the financial risk tolerance level of investors.

Based on these findings, we can conclude that age and the ability to take risks have an immediate connection between them. This is based on the fact that in Pakistani society people receive retirement benefits when they resign. Take the opportunity to put this measure of cash in existence. People in Pakistan take advantage of the opportunity to put resources in inventory once when they have finished with their household obligations and when they have no obligation to them. This statement is reinforced by writing that shows that the relative capacity to withstand risks decreases as individuals age (i.e., the degree of net wealth increases resources in increments of hazardous resources according to the individual's age) when different factors are maintained. In this way, random resistance increases with age (Wang and Hanna, 1997).

5. CONCLUSION

This study explored the various factors that matter in financial risk tolerance level of individual investors in the Pakistani context. The Dow Jones and Company questionnaire used by Jasim Y (2008) has been used for data collection and scale of (Bodie et al., 2007) utilized for analysis. Findings of this study concluded that there is comparatively more

chance of Male risk-taking in place of Female, more literate person's risk taker than less literate, earlier age persons are high-risk taker than elder investors, rich persons are more risk taker than poor investors, and retired persons are more risk taker than jobbies persons.

Changes in the investor's attitude towards financial risk explain the fluctuations in asset prices. The study implies that the investor's attitude from being risk-averse to risk tolerant is governed by not only his sentiments but also the demographic and socioeconomic factors plays their role. Investor's subsequent risk attitude get reflected in the overall market behavior driven through the investor behavior, trading patterns, and composition of active investors. The risk attitude of active individual investors determined by age, gender, education, wealth and nature of work makes the market volatile enough to obtain high returns. Policy makers may observe the market conditions in light of effective risk attitude and devise the risk management strategies for maintaining the pace of the market.

The results found may be improved by enhancing the sample size to get more realistic and exact results. Also, the data has been collected by questionnaires distributed in Karachi Stock Exchange, Islamabad Stock Exchange, and Lahore Stock Exchange through a broker and researcher was not there in person to help the investors to get them filled. This may affect the quality and understanding of the questionnaire by the investor. Overcoming the limitations of this study, future research may focus on the reasons as to why women are less financial risk tolerant than men. Also, the risk attitude of investors may be tested with the market volatility and returns realized by investors to more closely observe the relationship between investor sentiment and market forces.

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