DETERMINANTS OF INDIVIDUAL INVESTORS INVESTMENT DECISION IN PAKISTAN STOCK EXCHANGE

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A thesis submitted in fulfilment of the
requirements for the award of the degree of
Doctor of Philosophy

Azman Hashim International Business School
Universiti Teknologi Malaysia

APRIL 2019

DEDICATION

This thesis is dedicated

To

My Parents 'Mr. and Mrs. Ghulam Hussain (late)'

without whom none of my success was possible. They always remained staunch supporters of education. May Allah grant their souls Al-jannatul Firdaus.

My Wife 'Umara Noreen'

for her continued and unfailing love, support and understanding during my pursuit of Ph.D. degree. She was always around at times I thought that it is impossible to continue, she helped me to keep things in perspective.

My Children 'Fatima and Taha'

For coping with the undue paternal deprivation during the course of my study.

ACKNOWLEDGEMENT

First, I wish my sincerest gratitude to the Almighty Allah and His beloved Prophet Muhammad (peace be upon him). This thesis is the culmination of my PhD journey, which was just like climbing a high peak step by step accompanied with encouragement, hardship, trust, and frustration. When I found myself at top experiencing the sense of fulfilment, I realized that although only my name appears on the cover of this dissertation, a great many people including my supervisors, my family members, well-wishers, my friends, colleagues, and various institutions have contributed to accomplishing this huge task.

At this moment of accomplishment, I am greatly indebted to my main thesis supervisor Dr. Suresh A/L Ramakrishnan for his encouragement, guidance, criticism and friendship during the course of my study. This work would not have been possible without his guidance and involvement, his support and encouragement from the start of the project to completion. Under his guidance, I successfully overcame many difficulties and learned a great deal. His own zeal for perfection, passion, unflinching courage and conviction has always inspired me to do more. I am also very thankful to my co-supervisor Dr. Dewi Fariha Binti Abdullah for her unconditional support, advice and valuable feedback. Moreover, I wish to give earnest credit to my first supervisor Dr. Melati Binti Ahmad Anuar (late) who accepted me as her PhD student and offered me her mentorship. She was a good human being; may Allah grant her soul Al-jannatul Firdaus. For all these, I sincerely thank my supervisors from bottom of my heart and will be truly indebted to them throughout my lifetime.

No research is possible without infrastructure and requisite materials and resource. For this, I extend thanks to Universiti Teknologi Malaysia (UTM) for providing me with the requisite institutional facilities throughout my research tenure. I also greatly appreciate the administrative staff at Azman Hashim International School, UTM for their cooperation and support. Moreover, I am thankful to UTM library staff for their help and assistance in supplying the relevant literature. I greatly appreciate and acknowledge the support received from Pakistan Stock Exchange (PSX) for my data collection. The results described in this thesis would not have been obtained without their support. I am equally thankful to the administration of Kalej Dato Onn Jafar (KDOJ) for providing good accommodation and a healthy environment.

My parents (late) deserve special tribute for their endless contribution and prayers throughout my life. May Allah grant their souls Al-jannatul Firdaus. I owe thanks to a very special person, my wife, *Umara Noreen* for her continued love, support and prayers. I appreciate my kids, *Fatima, and Taha* for abiding my ignorance and the patience they showed during my PhD. I am also grateful to my parents in law, *Mr. and Mrs. Hafiz Muhammad Yousaf*, my brothers *'Zeeshan and Nouman*' and sisters *"Tanvir, Naheed, Samina, Rahila and Humaira"* for their moral support. My sincere appreciation also extends to all other family members and well-wishers for their kind prayers. I am extremely thankful to all those researchers, academicians, and practitioners who contributed towards my understanding and thoughts. My fellow postgraduate student should also be recognized for their support. I am also thankful to all my friends who have provided assistance at various occasions. Their views and tips are useful indeed. Finally, I would like to thank everybody who played an important role in the successful realization of this thesis.

ABSTRACT

Financial wellbeing of individual investor is driven by sound investment decision making ability. This study investigates the determinants influencing investment decision making behaviour among individual equity investors. Primarily, the study investigated the direct impact of financial literacy, behavioural and environmental factors on investment decision making behaviour and financial risk tolerance. The study further highlighted the mediating effect of financial risk tolerance in the relationship between financial literacy, behavioural factors, environmental factors and investment decision making behaviour among individual equity investors. Finally, the study explored the moderating impact of financial experience in the relationship between financial literacy and financial risk tolerance. Using quantitative research design and multi-stage random, and convenience sampling, a survey questionnaire collected data from 382 registered individual investors of Pakistan Stock Exchange. The measurement model was tested by using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) techniques. Structural model tested the relationships between the constructs and revealed a positive and significant impact of financial literacy, behavioural and environmental factors on investment decision making behaviour and financial risk tolerance among individual equity investors. Similarly, financial risk tolerance mediated the relationship between the determinants such as financial literacy, behavioural factors, environmental factors, and investment decision making behaviour. Moreover, the research discovered slightly increased but insignificant contribution of financial experience as moderator between the relationship of financial literacy and financial risk tolerance. Hence, this study adds empirically by discovering mediating role of financial risk tolerance between the constructs of the model. This study suggests different measures to policymakers for improving financial literacy among individual investors. It also proposes significant functional insights for stockbrokers, investment advisors, and financial managers through examining the investment decision making behaviour of individual equity investors.

ABSTRAK

Kesejahteraan kewangan pelabur individu didorong oleh kebolehan dalam membuat keputusan pelaburan yang baik. Kajian ini menyelidik penentu yang mempengaruhi tingkahlaku dalam membuat keputusan pelaburan di kalangan pelabur ekuiti individu. Kajian ini pada awalnya akan menyelidik kesan langsung faktor celik kewangan, faktor tingkah laku dan alam sekitar terhadap tingkah laku membuat keputusan pelaburan dan toleransi risiko kewangan. Kajian ini juga menekankan peranan pengantara toleransi risiko kewangan dalam hubungan antara celik kewangan, faktor tingkah laku, faktor persekitaran dan tingkahlaku dalam membuat keputusan pelaburan di kalangan pelabur ekuiti individu. Akhirnya, kajian ini meneroka kesan penyederhanaan pengalaman kewangan dalam hubungan di antara celik kewangan dan toleransi risiko kewangan. Kajian ini menggunakan kaedah penyelidikan kuantitatif dan persampelan rawak berlapis, dan persampelan mudah, di mana kajiselidik dikutip daripada 382 pelabur individu berdaftar di Bursa Saham Pakistan. Model pengukuran diuji dengan menggunakan teknik Analisis Faktor Penerokaan (EFA) dan Analisis Faktor Pengesahan (CFA). Model struktur menguji hubungan tersebut dan mengesahkan kesan positif dan signifikan terhadap faktor celik kewangan, tingkah laku dan alam sekitar terhadap tingkah laku pengambilan keputusan pelaburan dan toleransi risiko kewangan di kalangan pelabur ekuiti individu. Analisis ini juga mengesahkan peranan pengantara toleransi risiko kewangan dalam hubungan antara penentu seperti literasi kewangan, faktor tingkah laku, faktor persekitaran dan tingkahlaku dalam membuat keputusan pelaburan. Tambahan pula, penyelidikan ini menemui sedikit peningkatan sumbangan pengalaman kewangan namun tidak signifikan sebagai penyederhana antara hubungan celik kewangan dan toleransi risiko kewangan. Oleh itu, kajian ini secara empirikal menyumbang dengan menemui peranan pengantara toleransi risiko kewangan ke atas hubungan antara celik kewangan, faktor tingkah laku, faktor persekitaran dan kebolehan dalam membuat keputusan pelaburan di kalangan pelabur ekuiti individu. Kajian ini mencadangkan pelbagai langkah kepada pembuat dasar untuk meningkatkan celik kewangan di kalangan pelabur individu. Kajian ini juga mencadangkan pemahaman yang penting kepada broker saham, penasihat pelaburan, dan pengurus kewangan melalui penelitian tingkah laku membuat keputusan pelaburan bagi pelabur ekuiti individu.

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AGFI	–	Adjusted Goodness of Fit Index
AMOS	–	Analysis of Moment Structure
AVE	–	Average Variance Extracted
BF	–	Behavioural Factors
CFA	–	Confirmatory Factor Analysis
CFI	–	Comparative Fit Index
CMIN	–	Minimum Chi-Square
CR	–	Composite Reliability
DF	–	Degrees of Freedom
EF	–	Environmental Factors
EFA	–	Exploratory Factor Analysis
FE	–	Financial Experience
FL	–	Financial Literacy
FRT	–	Financial Risk Tolerance
GFI	–	Goodness of Fit Index
IDMB	–	Investment Decision Making Behaviour
MSV	–	Maximum Shared Variance
NCCPL	–	National Clearing Company Pakistan Limited
NFI	–	Normed Fit Index
PCA	–	Principal Component Analysis
PFL	–	Perceived Financial Literacy
PSX	–	Pakistan Stock Exchange
RMR	–	Root Mean Square Residual
RMSEA	–	Root Mean Square Error of Approximation
SECP	–	Security and Exchange Commission of Pakistan
SEM	–	Structural Equation Modeling
SPSS	–	Statistical Package for the Social Sciences
TLI	–	Tucker Lewis Index
UIN	–	Unique Identification Number

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CHAPTER 1

INTRODUCTION

1.1 General Overview

Decision making is a complex process that occupies a pivotal place in the field of behavioural finance. Investor behaviour is based on various psychological and behavioural biases other than market volatility and opportunities for profit maximization (Kim and Nofsinger, 2008; Puaschunder, 2017b). The variations in behavioural biases, financial awareness, market participation and experience are some of the major causes of dissimilarity and divergence in investment decisions of individuals (Lusardi and Scheresberg, 2013). The modern finance theories explained the importance of both traditional and behavioural finance in investment decision making process (Olsen, 1998).

In the case of traditional finance, theorists argued that individuals are rational in their financial choices and investment decisions; therefore, they utilize and analyse all available market information for making investment decisions (Shiller, 1999). Traditional finance researchers also believe that financial markets are efficient (Statman, 1999). Several theories have supported this viewpoint including the theory of investment by Modigliani and Miller (1958), capital asset prices theory by Sharpe (1964), theory of efficient capital markets by Malkiel and Fama (1970), theory of rational option pricing by Merton (1973) and foundations of portfolio theory by Markowitz (1991). An eminent theory of finance, the Efficient Market Hypothesis (EHM) developed by Eugene Fama in 1970 describes that prices of stocks completely reflect all available market information; therefore, investors behave rationally. Moreover, EHM states that markets are efficient; hence, analysis of the stocks are worthless (Ackert, 2014). In addition, Shiller (1999) explains that in EMH, individuals cannot produce unusual returns without taking extreme investment risk.

Alternatively, behavioural finance researchers investigated that investors are not as rational in investment decision making as believed by the traditional finance researchers. Schindler (2007) demonstrated that behavioural finance investigates psychological, cognitive and social aspects of investors behaviour and their effects on financial decisions. Therefore, investors may improve the capability of decision making, financial performance and risk tolerance by identifying their behavioural biases (Waweru et al., 2008; Agarwal et al., 2016). Behavioural finance researchers also challenged traditional finance theories and their notion about investment decision making. In this regard, several theories and articles were presented by the behavioural finance theorists such as Psychology of stock market by Selden (1912), The powerful consumer: a risk aversion in the small and in the large by Pratt (1964) and The prospect theory by Kahneman and Tversky (1979). Thereafter, in mid-1980s, the idea of behavioural finance emerged tremendously (Kim and Nofsinger, 2008). Eventually, in late 1990s and after 2000, the concept of behavioural finance made an incredible space in the field of research and developed as a core requirement for financial research. In recent years, behavioural finance has a substantial position in investment decision making of individuals (Olsen, 1998; Kim and Nofsinger, 2008; Checkley et al., 2017).

1.2 Background of the Study

Behavioural researchers believe that investors generally behave irrationally while deciding their investment options (Kahneman and Tversky, 1979). Recent evidence suggests that investors' decision making is massively dependent upon different internal and external behaviors and factors (Shefrin and Statman, 2000; Shleifer, 2000). Over the past decade, investigation of these factors and behaviours remained the main focus of behavioural researchers. Considerable existing research examined the impact of behavioural and cognitive biases on investors' decision making behaviour. For instance, subsequent studies debated the significance of numerous factors including psychological, behavioural, environmental, financial literacy, experience, and risk for investment decision making of individuals (Lusardi and Scheresberg, 2013; Elmassri *et al.*, 2016; Yew *et al.*, 2017; Asad *et al.*, 2018; Bhat, 2018; de Goeij *et al.*, 2018; Shah *et al.*, 2018).

Furthermore, the issue of financial literacy has received considerable attention in investment decision making process (Ahmed *et al.*, 2017; Clark *et al.*, 2017). Recent investigations evidenced that financial literacy is one of the leading causes that affect investment decisions of individuals (Lusardi and Tufano, 2015). It develops financial concepts and understanding of financial products (Becchetti *et al.*, 2013). Moreover, it shapes investors' confidence and increases their participation in equity markets (van Rooij *et al.*, 2007, 2011). Therefore, adequate financial literacy is necessary for making sound and informed investment decisions (Yew *et al.*, 2017).

Additionally, the literature highlighted the impact of behavioural factors on investment decisions. Various studies investigated the effect of behavioural factors such as heuristics, prospect, herding, market variables and overconfidence on investors' decision making behaviour (Ghalandari *and* Ghahremanpour, 2013; Blake *et al.*, 2017; Asad *et al.*, 2018; Shah *et al.*, 2018). The behavioural factors including heuristics and herding are the most influential factors leading to irrational financial behaviour of individuals (Chandra and Kumar, 2012; Pompian, 2012). Moreover, individuals' investment decisions are hugely dependent on heuristics and market variables (Chandra and Kumar, 2012). Similarly, herding, market, overconfidence and anchoring ability have a significant and positive impact on investor's decision making behaviour (Luong and Ha, 2011; Kengatharan and Kengatharan, 2014).

Despite the huge significance of behavioural factors, researchers have also explored the significance of environmental factors in financial decisions. The environmental factors play an important role in the usage of capital, investment methods, risk avoidance and strategic investment decisions of investors (Elmassri *et al.*, 2016). In addition, a stable political, economic and security environment has a positive impact on equity markets and their investors. Various other studies also reported a positive impact of environmental factors including political, economic, security and social environment on investment decisions of investors (Carr *et al.*, 2010; Kan, 2017; Mnif, 2017; Tsai, 2017; Markoulis and Katsikides, 2018).

Furthermore, the importance of financial experience and risk tolerance in money management, retirement planning and financial decision making of individuals is also highlighted by several previous studies (Mandell, 2008; Chou *et al.*, 2010; Roszkowski and Davey, 2010; Lusardi and Tufano, 2015; Awais *et al.*, 2016). The individuals' financial behaviour has substantial dependence on financial experience (Mandell, 2008; Dvorak and Hanley, 2010). Moreover, the financial experience is positively related to risk tolerance capability (Frijns *et al.*, 2014). Also, the individuals' greater involvement in financial activities is a process of self-learning which makes them more financially knowledgeable. Consequently, individuals acquire more financial capability for better risk tolerance. The financial experience also has a significant role in risk handling capability of investors (Sohn *et al.*, 2012). Similarly, the participation in financial activities leads to financial experience that further leads to better financial risk tolerance (Mandell, 2008; Chou *et al.*, 2010; Roszkowski and Davey, 2010).

In conclusion, previous literature highlighted that psychological, behavioral, environmental, financial knowledge, financial risk and experience are increasingly important determinants for investment decision making behavior of investors. To get insight of investment decision making determinants, most of the research surveys were conducted in developed markets because of well-established financial institutions, an easy access to the data and respondents, and healthier research environment (Caparrelli *et al.*, 2004; Brunton, 2006, 2009; Van Rooij *et al.*, 2011; Arrondel *et al.*, 2013). However, some studies have also been conducted in developing markets to examine the decision making behaviour of investors (Al-Tamimi and Kalli, 2009; Jariwala, 2015; Chu *et al.*, 2016; Ghaffar and Sharif, 2016).

1.3 Background of the Problem

Investment decision making behaviour is multifaceted phenomena driven by various determinants. The proper recognition of investment decision making determinants may lead to informed and lucrative investment decisions. In this regard, financial literacy has been identified as one of the fundamental determinants for investment decision making. Clark *et al.* (2017) indicated that financial literacy emerged as a central problem for individual investors in the last decade. The financially literate individuals have a competitive edge in investment management, financial decision and retirement planning (Ahmed *et al.*, 2017; Gupta and Gupta, 2018).

Existing evidence indicated that most of the work on financial literacy in terms of actual (basic) has been done in developed countries such as US, Europe, Japan, New Zealand and Australia, (Hilgert *et al*., 2003; Moore, 2003; Brunton, 2006, 2009; Christelis *et al*., 2010; Lusardi and Mitchell, 2011). Conversely, some studies on basic financial knowledge have been conducted in developing markets i.e. China, UAE, India and Pakistan (Al-Tamimi and Kalli, 2009; Chu *et al.*, 2016; Ahmed *et al*., 2017; Gupta and Gupta, 2018). It is evident that financial literacy level in developed countries is sufficient but still lower than the needed level; whereas, in developing countries, it is far behind the required level. The developed markets have various organizations for assessment and improvement of financial literacy. For instance, Brain Arts Productions (BAP) is US based organization focusing on financial literacy for toddlers to high school seniors. The National Endowment for Financial Education (NEFE) is another organization dedicated to the improvement of financial education among individuals and households in the USA. Organization for Economic Cooperation and Development (OECD) is also working on the improvement of financial literacy among the individuals of its member countries such as US, UK, Germany, Italy, Australia, France and Japan. On the other hand, the developing countries are facing many issues such as no proper financial literacy organizations, lack of financial literacy surveys and improvement techniques.

Figure 1.1 presents that top 10 positions are captured by the developed markets and Norway is at the top in global financial literacy ranking with financial literacy score of 71. Moreover, only the top 14 countries have literacy score greater than 50 and none of the developing nations is near to this average score; however, Sri Lanka is in 67th position with financial score of 35. Therefore, in forthcoming scenarios, sufficient financial literacy is necessary for investors to deal with complex financial products (Lusardi and Mitchell, 2014; Allgood and Walstad, 2016).

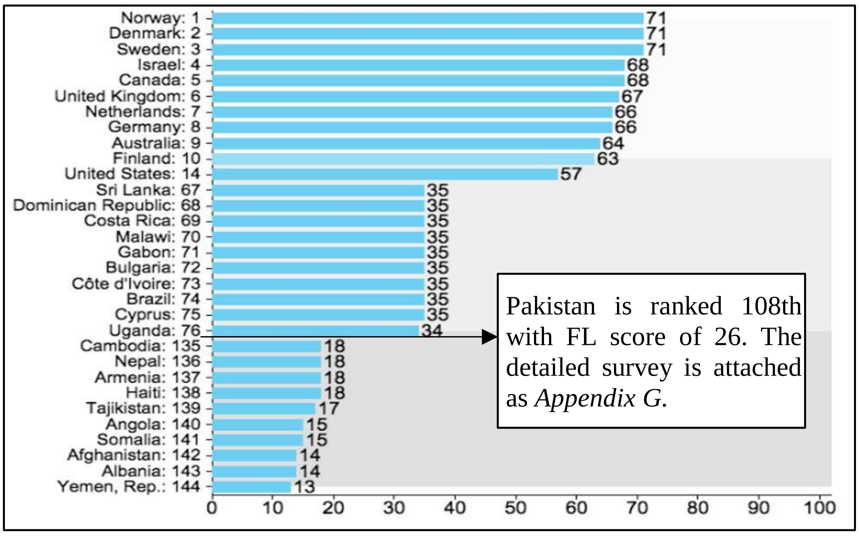

Figure 1.1 Global Financial Literacy Ranking (Global S&P FL Survey, 2016)

Along with basic financial literacy, advance financial literacy is also important for investment financial making (Van Rooij *et al.*, 2011). The actual advance financial literacy significantly affects financial decision making; hence, those with low advance financial literacy are much less likely to invest in stocks (Lusardi and Mitchell, 2011; Van Rooij *et al.*, 2011). Therefore, investigation of advance actual financial literacy is imperative to determine the true impact of actual financial literacy on investment decision making of investors (Allgood and Walstad, 2016). In addition, perceived financial literacy has a significant effect on investment decision making, as over or under assessment of financial knowledge can make investors over or under confident (Huzdik *et al.*, 2014). Perceived and actual financial knowledge are positively associated with investors' confidence and effective financial planning (Parker *et al.*, 2012). Additionally, perceived and actual knowledge are equally important to make informed investment decisions (Allgood and Walstad, 2016). The prior discussion is evidence that majority of the researchers have examined only the basic concepts of financial literacy; therefore, financial literacy in terms of perceived and actual (basic and advance) remained overlooked that might have understated its influence on investment decisions (Lusardi and Mitchell, 2011; Yew *et al.*, 2017; de Goeij *et al.*, 2018). Allgood and Walstad (2016) argued that both perceived and actual financial literacy determine the true level of financial knowledge and its real impact on investors’ decision making.

In addition to financial literacy, various studies also indicated that behavioural factors i.e. herding, heuristics and market variables are the most influential behavioural biases with significant impact on investors' decision making (Luong and Ha, 2011; Blake *et al.*, 2017; Chawla *et al.*, 2018; Shah *et al.*, 2018). Herding and heuristics have a significant and positive impact on investment performance of stock investors (Puaschunder, 2017a). Moreover, investors with herd behaviour follow the investment decisions of a dominant group of investors (Fang *et al.*, 2017). Heuristics is also very significant for investment decisions of investors (Shah *et al.*, 2018). Moreover, investor's reaction to market variables such as stock price changes and past market trends is crucial for investment decisions and financial performance (Waweru *et al.*, 2008; Phan and Zhou, 2014a). The evidence from different developed and developing markets i.e. United States, Japan, Italy, Spain, China, India, Taiwan, Sri Lanka and Pakistan identified a significant role of herding behaviour in developing markets, while having a minimal role in developed markets (Economou *et al.*, 2011; Lao and Singh, 2011; Luong and Ha, 2011; Asad *et al.*, 2018). The developed markets are well-established and display entire market information, whereas the developing markets are uncertain and exhibiting asymmetric information. Therefore, investors in developing markets are more dependent on behavioural biases than the developed markets.

Despite the behavioural factors, researchers also highlighted substantial importance of environmental factors for financial activities. The environmental factors including political and economic and security situations have attracted significant attention from financial investors, economists and policymakers (Elmassri *et al.*, 2016; Tsai, 2017; Douglass, 2018). Various forces of economic environment i.e. inflation, gross domestic product, interest and exchange rate have a significant impact on financial activities and market performance (Cheung and Ng, 1998; Schumpeter and Backhaus, 2003; Ho, 2017). In respect of developed and developing markets, the economic forces are directly related to market performance and volume of investment in Europe (Horobet and Dumitrescu, 2009). Similarly, domestic or global discrepancies in economic environment apply huge pressure on stock returns; hence, effect investors' decisions (Deb and Mukherjee, 2008). Suvitsakdanont (2000) also observed huge dissimilarities in investment decisions of Thai and American stock investors due to different economic environments of the two countries. The impact of economic environment on developing markets is greater than the developed markets because of more uncertain economic conditions.

The political environment is another important aspect of environmental factors. Both stable or unstable political environment has significant impact on investment activities in the market (Julio and Yook, 2012). Some evidence from developed and developing markets indicate that political environment has a significant impact on investment activities. For instance, individuals usually avoid investing during election period because of greater political uncertainty and market volatility (Bernhard and Leblang, 2006). Similarly, political news applies significant pressure on stock prices, trading volume and financial activities (Pástor and Veronesi, 2013). Politically active individuals also have greater market information than their inactive counterparts, and hence are able to make better investment decisions (Bonaparte and Kumar, 2013). Likewise, political affiliation and government policies significantly influence investors' behaviour in the market (Bonaparte *et al.*, 2012; Hong and Kostovetsky, 2012). Security challenges including terrorism have gained huge importance due to their long-term impact on economic conditions, medium-term on investor confidence and short-term on financial markets (Barry Johnston and Nedelescu, 2006; Markoulis and Katsikides, 2018). Type and pattern of security unrests and terrorist incidents such as location, timing, frequency and intensity significantly influence the financial market performance (Aslam and Kang, 2015; Larson *et al*., 2016). The discussion reveals that the developing markets have received considerable attention due to greater uncertainty in environmental factors. In addition, environmental factors remained a continuing concern for researchers in different domains i.e. market performance, volume of investment and stock returns. However, investigation of environmental factors with respect to investment decision making behaviour of individual stock investors needs further consideration.

This study would like to choose one of the developing nations i.e. Pakistan. Pakistan stock exchange (PSX) is extremely important to investigate investment decision making determinants of individual investor. The PSX is a key driving force for economic growth in the country; however, facing many issues i.e. high volatility, uncertain economic, political and security conditions, massive heterogeneity among investors behaviour and poor financial awareness (Amjad, 2010; Shafi, 2014; Ishfaq and Anjum, 2015; Ghaffar and Sharif, 2016; Tabassam *et al.*, 2016). For instance, Figure 1.2 indicates that the disqualification of Prime Minister of Pakistan by the Supreme Court on August 20, 2017 has generated huge political and economic uncertainty. In response, the market dropped by 14,000 points from 52,000 to 38,000 (Ahmad, 2017; Waseem, 2017). Moreover, the common individual investors of PSX are also uncomfortable to invest in the market due to the supremacy of big individual and institutional investors (Asad *et al.*, 2018). For example, the total number of registered individual investors is almost 0.23 million, whereas there are almost 31.5 million bank and fixed deposit holders (NCCPL, 2018; PSX, 2018; Express Tribune, 2018). This indicates that PSX remained unsuccessful to attract a major portion of investors base.

Financial literacy is increasingly recognized as a serious issue for stock investors in Pakistan. The Pakistani researchers and policymakers did not pay proper attention to this issue (Bhabha *et al.*, 2014). The individual stock investors have insufficient financial literacy; therefore, institutional investors dominate and hold a major portion of stocks (Ghaffar and Sharif, 2016). Similarly, due to the lack of financial awareness, investors are more interested to invest in fixed deposits than stocks (Bashir *et al.*, 2013a). Figure 1.1 is validating the argument that Pakistan is ranked 108th with literacy score of 26, which is far behind the required level of financial literacy. This also verifies that financial literacy is one of the key issues for Pakistani investors in investment decision making. Moreover, behavioural factors have been recognized as major contributing factors for investment decisions in Pakistan (Mahmood *et al.*, 2016). Herding behaviour has significant and positive impact on investment decisions (Khan, 2014). Likewise, there is a positive correlation among herding, heuristics and perceived investment decisions (Qureshi and Hunjra, 2012; Ishfaq and Anjum, 2015). Moreover, a massive heterogeneity among behavioural biases of Pakistani equity investors has been identified by the researchers (Shafi, 2014; Ishfaq and Anjum, 2015). Hence, due to the immense contribution of behavioural factors, it is necessary to investigate the effect of behavioural factors on investment decisions of PSX investors.

Nevertheless, the significance of environmental factors for market performance and investment decisions has also been explored by some studies in Pakistan (Gul *et al.*, 2010; Ali *et al.*, 2013; Aslam and Kang, 2015; Tabassam *et al.*, 2016). Pakistani investors have faced economic and political instability over the years; therefore, they are reluctant to invest in stock market (Tabassam *et al.*, 2016). Similarly, political uncertainty, weak economic conditions, corruption and energy crises have disheartened the local and foreign investors for many years, which resulted into low investment rate (Ali *et al.*, 2013). Terrorism remained another issue for Pakistani market. The location, timing, intensity and frequency of terrorist incidents exerted a significant impact on Pakistani market (Gul *et al.*, 2010; Aslam and Kang, 2015). However, the decreasing trend in terrorism over the past few years has had a positive impact on the market (Aslam *et al.*, 2015). Similarly, Hyder *et al.* (2015) stated that security measures have created an enabling environment for investment. Hence, the literature clearly indicates the significance of financial knowledge, behavioural and environmental factors for investor behaviour and market performance in Pakistan. Therefore, investigation of financial literacy, behavioural and environmental factors with respect to investment decision making behaviour among individual investors is momentously needed. Thus, the first intention of this study is to investigate the impact of financial literacy in terms of perceived and actual (basic and advance), behavioural factors and environmental factors on investment decision making behaviour among individual investors of Pakistan Stock Exchange.

Figure 1.2 Trends in PSX 100 index 2007-2017 (www.psx.pk)

Recent studies further highlighted the significance of various determinants for financial risk tolerance of individual investors. The financial risk tolerance has also been termed as risk-taking, risk acceptance and risk behaviour by the researchers. The evidence from developed and developing markets demonstrated the importance of financial literacy for risk perception and financial risk tolerance of individuals behaviour (Huzdik et al., 2014; Gustafsson and Omark, 2015). For instance, financial literacy increases financial risk tolerance of Swedish investors (Gustafsson and Omark, 2015). A higher financial literacy is also associated with the increased financial risk tolerance of investors in Europe (Grable, 2000; Hallahan et al., 2004). Moreover, investors with adequate financial literacy have extremely different financial risk perceptions and more positive risk-taking attitude than inadequate financially literate investors (Sjoberg and Engelberg, 2009; Yao et al., 2011). Therefore, to investigate the factual effect of financial literacy, it is crucial to examine all terms of financial literacy i.e. perceived and actual (basic and advance) with regard to financial risk tolerance.

Along with financial literacy, researchers also indicated a strong impact of behavioral and psychological biases on financial risk tolerance of individuals (Shefrin and Statman, 2000; Kutasi *et al.*, 2018). In view of developed and developing markets, the US investors with herd behavior are generally risk-averse and keen to invest in the stocks that have attracted attention in recent past (Odean, 1999; Fang *et al.*, 2017). Moreover, investors with herding behavior follow the investment decisions of leading investors to avoid risk factor. Furthermore, pension funds only display a strong herding effect in the United Kingdom (Blake *et al.*, 2017). The heuristics approach also leads to greater risk tolerance and risky investment decisions in India (Humra, 2016). In addition, the overall behavioral biases have significant contribution for risk tolerance of investors in the Indian market (Pandey and Jessica, 2018). The reaction to market variables i.e. stock price changes, market information, stocks trends and preference of investors also affect risk behavior of individual equity investors in Vietnam and Nigeria (Waweru *et al.*, 2008; Luong and Ha, 2011; Phan and Zhou, 2014). In recent years, behavioural biases have an increasing effect on risk tolerance in developing markets because of greater uncertainty, volatility and risk. Therefore, investors are more dependent on behavioural biases i.e. herding and heuristics in developing markets to tolerate the risk.

Together with financial literacy and behavioural factors, researchers also discussed the importance of environmental factors for equity investors' financial risk tolerance (West and Worthington, 2012; Narayan *et al.*, 2018). Stable economic and political environment leads to better risk tolerance capability of investors (Schumpeter and Backhaus, 2003; Ho, 2017). The investigations from developed and developing markets also display a huge significance of environmental factors for risk tolerance. For instance, change in economic environment leads to a relative change in risk behavior of Australian households (West and Worthington, 2012). Similarly, the economic environment has a significant impact on the risk tolerance of Australian equity investors (Santacruz, 2008). Moreover, individuals' high-risk behavior is caused by two major economic forces i.e. monetary growth and GDP (Harlow and Brown, 1990; Gerrans *et al.*, 2015). In addition, a stable economic growth has a positive effect on financial risk tolerance of investors in South Africa (Ho, 2017). The undesirable variations in inflation and interest rate also exert huge pressure on stock returns; hence, investors avoid purchasing risky securities. Political uncertainty also has a significant impact on stock volatility, as it generates risky investment conditions. Therefore, investors willingness for risk decreases and they postpone their investing activities (Boutchkova *et al.*, 2012; Baker *et al.*, 2015; Kan, 2017). The security challenges like terrorist incidents are major financial risk contributor and have significant impact on investors' risk tolerance in six different financial markets e.g. New Zealand, Australia and India etc. (Arin *et al.*, 2008; Ranga and Pradhan, 2014). Generally, the developed markets are more capable to absorb terrorism without exhibiting adverse economic and investment consequences (Gaibulloev and Sandler, 2009). Hence, the environmental factor may have greater impact on the investors of developing markets than the developed; therefore, it is receiving considerable attention from researchers.

In addition to the issues discussed earlier, Pakistan Stock Exchange (PSX) carries a very high-risk factor, which is higher than the neighboring markets i.e. India, Bangladesh and Sri Lanka (Amjad, 2010; Asad *et al.*, 2018). Moreover, PSX investors have extremely low financial literacy and are therefore facing ineffective risk management (Ghaffar and Sharif, 2016). Furthermore, a major proportion of female working class prefers to deposit their savings in banks to avoid financial risk due to lack of financial knowledge (Bhabha *et al.*, 2014). It is also evident that adequate financial knowledge is advantageous for investors' financial risk tolerance (Awais *et al.*, 2016). In addition, equity investors in Pakistan are highly dependent on different behavioral biases including herding and heuristics, and these biases have significant effect on risk tolerance behavior of investors (Ali *et al.*, 2016; Mahmood *et al.*, 2016; Najaf and Ashraf, 2016). Various studies also revealed that environmental factors such as economic conditions, political environment and security challenges have deterred equity investors and intensified financial risk in Pakistan (Ali *et al.*, 2013; Awais *et al.*, 2016). Likewise, the impact of political and economic forces on Pakistani investors and financial markets is greater during instability and increases the inherent risk factor of investment (Husain and Mahmood, 2001; Nishat and Shaheen, 2004; Ihsan *et al.*, 2007). However, stable political and economic environment and reducing trend of terrorism exert positive impact on investors' risk tolerance in PSX (Ihsan *et al.*, 2007; Aslam *et al.*, 2015).

Based on earlier discussion, financial literacy, behavioral and environmental factors have huge significance for financial risk tolerance; therefore, there is a dire need to explore the impact of these determinants on financial risk tolerance among individual equity investors of PSX. Hence, secondly this study investigates the influence of financial literacy in terms of perceived and actual (basic and advance), behavioral factors and environmental factors on financial risk tolerance among individual investors of Pakistan Stock Exchange.

The extant literature has widely discussed the role of financial risk tolerance in various domains (Van de Venter *et al.*, 2012). Financial risk tolerance plays an important role between financial literacy and investors' decision making (Awais *et al.*, 2016). In view of developed and developing markets, financially literate investors are highly risk tolerant and more willing to invest in risky assets in Australia (Nguyen *et al.*, 2016). The financially literate investors have better risk assessment and tolerance in decision making process (Sachse *et al.*, 2012; Gustafsson and Omark, 2015; Gupta and Gupta, 2018). Financial literacy also has significant effect on investment risk perception which leads to better decision making (Sachse *et al.*, 2012). In view of behavioral factors, investors usually try to minimize the investment risk through herding by following the recent trends in market, good decisions of peers, financial experts and fund managers (Odean, 1999; Kallinterakis *et al.*, 2010). The heuristics bias significantly affects the risk behavior in decision making process (Farooq and Sajid, 2015; Shah *et al.*, 2018). Accordingly, reaction to stock price changes and investor's preference deeply affect risk behavior of individual equity investors when making investment decisions (Waweru *et al.*, 2008). In respect of environmental factors, stable macroeconomic environment changes the attitude of Australian households for risk tolerance when making investment decisions (West and Worthington, 2012). Similarly, the investors have better attitude toward risk-taking during stable economic and political environment and are willing to make more investments (Yao, 2011). Conversely, the investors have an adverse attitude toward risk tolerance during an unstable economic and political environment, and therefore avoid making investments (Bloom *et al.*, 2007; Baker *et al.*, 2015; Bhat, 2018). Moreover, risk aversion and risk taking attitudes toward investment are strongly influenced by security unrest, as it makes investors risk-averse and unwilling to trade in financial markets (Levy and Galili, 2006). However, improved security conditions have positive impact on risk tolerance when making investment decisions. (Aslam *et al.*, 2015). Hence, the discussion indicates that financial risk tolerance may facilitate the association between investment decision making determinants and investor behaviour.

In relation to Pakistan, adequate financial knowledge is valuable for financial risk tolerance when making investment decisions (Awais *et al.*, 2016). Moreover, the investors risk tolerance attitude during investments activities is hugely dependent on behavioral biases (Mahmood *et al.*, 2016; Najaf and Ashraf, 2016). In addition, the economic and political environment is uncertain, which puts the investors in protective mode (Ihsan *et al.*, 2007; Aslam *et al.*, 2015; Awais *et al.*, 2016). Therefore, investors are compelled to think to what extent the risk can be taken, and risky investment can be made. Moreover, an unstable security situation and greater risk factors for many years have made Pakistani stock investors less risk tolerant (Aslam and Kang, 2015). Recent literature suggests that financial risk tolerance underlies the relationship between financial literacy, behavioral and environmental factors and investment decisions of investors. However, to what extent it mediates the relationships is required to be explored. According to the best knowledge of researcher of this study, only a review based study conducted by Awais *et al.* (2016) has argued the mediating role of financial risk tolerance in the relationship between financial literacy and investment decisions. Therefore, to fill the gap, the third main aim of the current study is to investigate the mediating role of financial risk tolerance in the relationship between financial literacy, behavioral factors, environmental factors and investment decision making behavior among individual investors of Pakistan Stock Exchange.

Furthermore, financial experience has been recognized an increasingly important factor for financial risk tolerance of individual investors by the researchers (Roszkowski and Davey, 2010; Sohn *et al.*, 2012; Frijns *et al.*, 2014; Huang, 2015; Lusardi and Tufano, 2015). The functional knowledge or experience of different financial activities affects investors' risk attitude (Johnson and Sherraden, 2007). Moreover, experienced investors can have good or bad experience which assists them to handle risky situations for better returns (Roszkowski and Davey, 2010; Bradbury *et al.*, 2014). Similarly, experienced investors have greater capability to hold risky stocks to achieve desired financial objectives. Likewise, a greater financial experience leads to better risk tolerance ability (Frijns *et al.*, 2014). In addition, individuals with financial knowledge and market participation have enough functional knowledge and experience to manage the risk (Mandell, 2008). Financial experience at an early age is also very crucial for individuals because such experiences have significant role in shaping financial behavior (Sohn *et al.*, 2012). However, less financially literate and inexperienced individuals have to face more risky situations than their counterparts (Gine *et al.*, 2013). In contrast, researchers also argued that financial and investment experience of investors did not necessarily influence financial risk tolerance to enhance investment returns (Chevalier and Ellison, 1999; Agarwal *et al.*, 2009; Tan and Chen, 2012). Thus, discussion reveals that financial experience may boost the risk tolerance capability of financially literate investors.

In respect to developed and developing markets, the US investors with adequate financial knowledge learn more functional knowledge and tolerate risk effectively (Frijns *et al.*, 2014; Lusardi and Tufano, 2015). Similarly, risk anticipation is largely based on past investment experience of Taiwanese investors (Fang and Chiu, 2010). Likewise, individuals working in UAE financial institutions like banks, investment companies and stock markets have greater financial experience to tolerate risk factor while making investments (Al-Tamimi and Kalli, 2009). Moreover, the level of financial literacy varies due to investors' prior financial experience and vice versa (Volpe *et al.*, 2002). The early age financial experience of Chinese individuals has positive impact on risk acceptance to get greater returns (Zhao *et al.*, 2010). In case of Pakistan, greater financial literacy and investment experience lead to higher financial risk tolerance among the investors (Awais *et al.*, 2016). Thus, while financial experience may have an increasing role in financial risk tolerance, the investors of developing markets have less financial experience due to limited market participation.

In this debate, most of the prior studies are consistent with the argument that financial experience significantly increases the financial risk tolerance of financially literate investors. This suggests that financial experience may have a moderating impact on financial risk tolerance of investors. According to the best knowledge of the researcher of this study, existing studies did not address the moderating impact of financial experience in the relationship between financial literacy and financial risk tolerance. Therefore, to find this knowledge gap, current study lastly investigates moderating role of financial experience between financial literacy and financial risk tolerance among individual investors of Pakistan Stock Exchange.

In summary, a considerable amount of research has been conducted on investment decision making determinants such as psychological, behavioral, environmental, financial knowledge, financial risk and experience in various developed and developing markets. However, an in-depth investigation of the determinants is needed especially in developing markets like Pakistan. In this relation, Attari et al. (2012), Awais et al. (2016), Ghaffar and Sharif (2016) and Asad et al. (2018) argued that small economies like Pakistan are dealing with high volatility, huge risk factor, less financially literate investors and uncertain political, economic, and security environment. Therefore, investigation of investment decision making determinants is more appropriate and required in Pakistan Stock Exchange (PSX). Hence, this study investigates the impact of investment decision making determinants on investor behaviour among individual investors of PSX by introducing financial risk tolerance as mediator and financial experience as moderator.

1.4 Problem Statement

Keeping in view the background of the study and background of the problem, this research intends to highlight the issues related to investment decision making behaviour of equity investors in Pakistan Stock Market. First, the existing research has discussed the impact of basic financial literacy (Van Rooij *et al.*, 2011; Lusardi and Mitchell, 2014; Clark *et al.*, 2017; de Goeij *et al.*, 2018; Gupta and Gupta, 2018), behavioural factors (Waweru *et al.*, 2008; Luong and Ha, 2011; Agarwal *et al.*, 2016; Asad *et al.*, 2018; Pandey and Jessica, 2018; Shah *et al.*, 2018) and environmental factors (Carpentier and Suret, 2015; Elmassri *et al.*, 2016; Mnasri and Nechi, 2016; Ho, 2017; Kan, 2017; Mnif, 2017; Tsai, 2017; Douglass, 2018) on financial markets and investors in different domains such as retirement planning, wealth management, saving, and financial performance. The previous researchers examined the impact of basic financial literacy and behavioural factors on investors decisions, whereas in-depth investigation of environmental factors remained ignored in this regard. Similarly, empirical investigation of financial literacy in terms of perceived and actual (basic and advance) remained unexplored which understated its impact on investor behaviour. Therefore, current research aims to investigate the direct impact of financial literacy including perceived and actual, behavioural factors and environmental factors on investment decision making behaviour among individual equity investors of Pakistan Stock Exchange.

Second, numerous studies have been carried out on factors influencing risk tolerance of investors. For instance, subsequent studies investigated that level financial literacy largely influences the risk-taking and risk tolerance of investors (Almenberg and Säve-Söderbergh, 2011; Huzdik *et al.*, 2014; Lodhi, 2014; Gustafsson and Omark, 2015; Awais *et al.*, 2016; de Goeij *et al.*, 2018). Similarly, literature identified the influence of behavioural and environmental factors on selection of risky portfolios, risk-taking ability, effective usage of capital and strategic investment decisions among the investors (Waweru *et al.*, 2008; West and Worthington, 2012; Ali *et al.*, 2016; Elmassri *et al.*, 2016; Asad *et al.*, 2018; Bhat, 2018). However, current study aims to investigate the impact of financial literacy in terms of perceived and actual (basic and advance), behavioural factors and environmental factors on financial risk tolerance among individual investors of Pakistan Stock Exchange.

Third, Awais *et al.* (2016) reviewed the role of financial risk tolerance between financial literacy and investment decisions which needs further in-depth empirical investigation. Similarly, West and Worthington (2012) and Nguyen *et al.* (2016) discussed the role of financial risk tolerance among the relationship of financial literacy, financial advice and economic activities. However, the mediating role of financial risk tolerance among the relationship of financial literacy, behavioural factors, environmental factors and investment decision making behaviour remained untapped in the literature. Hence, this study intends to introduce the financial risk tolerance as mediator in the relationship between the determinants including financial literacy, behavioural factors, environmental factors and investment decision making behaviour among individual investors of Pakistan Stock Exchange.

Lastly, many researchers highlighted the importance of financial experience for money management, risk-taking behaviour and risk tolerance (Roszkowski and Davey, 2010; Lusardi and Mitchell, 2014; Lusardi and Tufano, 2015; Awais *et al.*, 2016). Similarly, investigators identified that financial experience increases the ability of risk management, confidence to invest in risky stocks and market participation (Roszkowski and Davey, 2010; Lusardi and Tufano, 2015). However, review of the comprehensive literature indicated that moderating impact of financial experience in the relationship between financial literacy and financial risk tolerance is yet to be explored. Therefore, this research investigates the moderating impact of financial experience in the relationship between financial literacy and financial risk tolerance among individual investors of Pakistan Stock Exchange.

1.5 Research Questions

1. Do financial literacy, behavioural factors and environmental factors influence investment decision making behaviour among individual investors of Pakistan Stock Exchange?
2. Do financial literacy, behavioural factors and environmental factors influence financial risk tolerance among individual investors of Pakistan Stock Exchange?
3. Does financial risk tolerance mediate the relationship between financial literacy, behavioural factors, environmental factors and investment decision making behaviour among individual investors of Pakistan Stock Exchange?
4. Does financial experience moderate the relationship between financial literacy and financial risk tolerance among individual investors of Pakistan Stock Exchange?

1.6 Research Objectives

1. To examine the direct impact of financial literacy, behavioural factors and environmental factors on investment decision making behaviour among individual investors of Pakistan Stock Exchange.
2. To examine the direct impact of financial literacy, behavioural factors and environmental factors on financial risk tolerance among individual investors of Pakistan Stock Exchange.
3. To examine the mediating impact of financial risk tolerance in the relationship between financial literacy, behavioural factors,

environmental factors and investment decision making behaviour among individual investors of Pakistan Stock Exchange.

4. To examine the moderating impact of financial experience in the relationship between financial literacy and financial risk tolerance among individual investors of Pakistan Stock Exchange.

1.7 Significance of the Study

This research provides an important opportunity to the author for empirical contribution and policy implications. In empirical perspective, this research adds to existing body of knowledge by investigating the impact of financial literacy in terms of perceived and actual (basic and advance), behavioural factors and environmental factors on investment decision making behaviour and financial risk tolerance among individual investors of Pakistan Stock Exchange.

Moreover, this study makes a major contribution in existing literature by investigating financial risk tolerance as mediator among the relationship of financial literacy, behavioural factors, environmental factors and investment decision making behaviour. Previously, Awais *et al.* (2016) reviewed the role of financial risk tolerance between financial literacy and investment decisions. Similarly, West and Worthington (2012) and Nguyen *et al*. (2016) discussed the significance of financial risk tolerance among the relationship of financial literacy, financial advice and economic activities. Therefore, according to author's best knowledge, this is the ground-breaking study to undertake financial risk tolerance as mediator in the relationship between financial literacy, behavioural factors, environmental factors and investment decision making behaviour among individual investors Pakistan Stock Exchange.

In addition, current study contributes to the body of knowledge by introducing financial experience as a moderator between financial literacy and financial risk tolerance, as majority of the research identified financial experience as an advantage for financially literate investors for risk management and risk tolerance

(Corter and Chen, 2006; Chou *et al.*, 2010; Roszkowski and Davey, 2010; Lusardi and Tufano, 2015; Awais *et al.*, 2016). Hence, this study aims to establish the moderating role of financial experience in the relationship between financial literacy and financial risk tolerance among individual investors of Pakistan Stock Exchange.

The research also extends the role of financial literacy by empirically investigating the effect of financial literacy on investment decisions of individual equity investors in Pakistan. Past literature is evidence that most of the investigations on financial literacy are descriptive in nature; however, a few researchers in developed markets examined it empirically e.g. (Moore, 2003; Lusardi and Mitchell, 2007, 2011; Van Rooij *et al.*, 2011; Allgood and Walstad, 2016). The researchers focused only on developed markets; therefore, developing markets i.e. Pakistan remained unaddressed. Hence, according to the best of our knowledge, this is the first study which empirically measures all topographies of financial literacy i.e. perceived and actual (basic and advance) to investigate the factual effect of financial literacy on investment decision making behaviour among individual investors of Pakistan Stock Exchange.

In relation to policy implications, this research suggests different measures to policymakers, security brokers and PSX authorities for the improvement of financial literacy and market participation among individual and institutional investors. Current study offers a path to individual investors for wealth accumulation by attaining maximum savings that has an ultimate impact on national savings, poverty reduction and stable macroeconomic environment of the country. Moreover, this study is a strategy document for policymakers who wish to increase national savings by improving financial knowledge and macroenvironment understanding of individual and institutional investors.

Furthermore, this research is a guideline for academia to improve the level of financial literacy among students of Pakistan; the future investors. It also proposes multidimensional functional insights for stock brokers, money managers, investment advisors and financial managers of companies listed at PSX through examining decision making behaviour of individual equity investors in a larger perspective ranging from personal financial knowledge and behaviour to macro environmental factors. The study also offers some important insights of financial knowledge, behavioural biases, environmental factors, financial experience and financial risk tolerance which may facilitate the relevant stakeholders to guide individual investors accordingly.

1.8 Scope of the Study

The primary objective of this study is to get key insights from different perspective to develop an understanding of the determinants that effect investment decision making behaviour of individual equity investors. Therefore, this study investigates the impact of financial literacy in terms of perceived and actual (basic and advance), behavioural factors in terms of heuristics, herding and market variables, and environmental factors in terms of stable economic and political environment, and decreasing terrorism on investment decision making behaviour of individual equity investors. In addition, the study examines financial risk tolerance as mediator in the relationship between the determinants including financial literacy, behavioural factors, environmental factors and investment decision making behaviour among individual investors of Pakistan Stock Exchange (PSX). It also investigates the impact of financial experience as moderating in the relationship between financial literacy and financial risk tolerance among individual equity investors of PSX.

Moreover, the current study investigates financial knowledge, behavioural biases and macroenvironmental understanding of individual stock investors; therefore, it is not generalizable to other groups of investors such as institutional investors, money managers and investment experts and financial consultants. The stated segments of investors display different type of financial knowledge and behavioural biases and adopt a different approach to cater to environmental factors. Moreover, the portfolio management and trading behaviour of these segments differ widely among individual equity investors.

Furthermore, the scope of this study is comprised of 384 registered individual investors out of total of 225,354 investors of Pakistan Stock Exchange (PSX). The investors are registered through security brokers licensed by Security Exchange Commission of Pakistan (SECP) and contain Unique Identification Numbers (UIN). In addition, the study uses a survey questionnaire for collection of data from registered individual investors of PSX and then processes the data by using statistical software i.e. SPSS and AMOS. It further employs structural equation modeling (SEM) technique to find the causal relationships among the constructs of the study. To this end, the study is generalizable to the other developing markets with respect to their own influential behavioural and environmental factors.

1.9 Operational Definitions of the Variables

This section of the study presents precise definitions of the important terms regularly used in the study. The operational definitions of the important terms are as follows:

- **Investment Decision Making Behaviour:** Investment decision-making behaviour is the process of selecting a particular alternative from multiple alternatives in order to reach a conclusion on certain given issue.
- **Financial Literacy:** Financial literacy is the procedure which increases financial awareness, improves concepts and empowers people to make educated financial decisions by avoiding mistakes.
- **Actual Financial Literacy:** Actual financial literacy means what people actually know about finance and their ability for making financial decisions.
- **Perceived Financial Literacy:** Perceived financial literacy is individual's self-assessment and self-trust in their financial knowledge.
- **Behavioural Factors:** Behavioural factors are the biases governing the behaviour of individuals in making financial decisions.
- **Heuristics:** Heuristics are basically rules of thumb which lead to easier financial judgments.

- **Herding Effect:** Herding effect can be defined as the investment decisions taken by a group of investors on particular information by ignoring appropriate and relevant information.
- **Market Variables:** Reaction of investors to stock market characteristics which govern the investor behaviour.
- **Environmental Factors**: Environmental factors can be defined as the macroenvironmental conditions cause investor behaviour in making a decision.
- **Economic Environment:** Economic environment is an economic scenario developed by various economic forces in a country and affects investor behaviour.
- **Political Environment:** Political environment is the occurrence of accidental or scheduled political events that generate stable or instable political conditions, and influence investors' behaviour.
- **Terrorism:** Terrorism is the cause of public terror which damages their emotions; therefore, investors tend to perceive the consequence irrespective of real outcomes of investment decisions. However, decreasing terrorism may have positive outcomes.
- **Financial Risk Tolerance:** Financial risk tolerance is an utmost level of uncertainty that an individual is agreed and willing to accept while making an investment decision.
- **Financial Experience:** Financial experience is prior functional knowledge of financial products and characteristics of different financial choices.

1.10 Organization of the Study

This study consists of five chapters. The first chapter includes the background of the study and problem, problem statement, questions, objectives, and scope of the research. Chapter two deals with review of theoretical and empirical literature about investor behaviour and insight into the factors (i.e. financial literacy, behavioural and environmental factors) affecting investor behaviour. It also represents research framework and hypotheses. Chapter three includes research methodology being used for the investigation of this study including a brief introduction to research design, an overview of target population, sampling and data collection technique, construction of instrument, pilot and pre-testing, measurement of variables and tools used for data analysis.

Chapter four incorporates the results attained after statistical data modeling to answer the research questions. The chapter elaborates initial data screening, exploratory and confirmatory factor analysis, measurement modeling, testing of hypothesis for structural model through structural equation modeling and hypothesized relationships among the variables. Chapter five comprises discussion on findings such as research overview, discussion on each objective with respect to the findings determined through analysis, empirical and policy implications, limitations and future recommendations of the study.

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