International Journal of Advanced Research in Economics and Finance
e-ISSN: 2682-812X | Vol. 3, No. 4, 55-72, 2021
http://myjms.mohe.gov.my/index.php/ijaref

The Relationship between Psychological Factors, Risk Perception and Social Media on Investment Decision Making

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Accepted: 15 November 2021 | Published: 1 December 2021

DOI: https://doi.org/10.55057/ijaref.2021.3.4.6

Abstract: *The purpose of this paper is to examine the determinants of investor's investment decision-making in Indian stock markets. The hypothesized direct and indirect effect of psychological factors (anger, positive mood, fear and stress) and risk perception on investment decision making are based on the Behavioural Economic theory. However, the Cultivation theory is used as the basis to test the moderating effect of social media on investment decision-making. The data for the present quantitative study was collected using online survey questionnaire distributed to stock market investors in India. The samples were collected using convenient and snowballing sampling. The research hypotheses were tested and analysed using Partial Least Squares approach for direct and indirect effect test and Product Indicator approach for moderation analysis. Risk perception found to be significant in mediating the relationships between psychological factors such as anger, positive mood and stress towards stock market investment decisions. However, social media does not moderate the relationships between all the tested psychological factors and stock market investment decisions among Indian investors. The findings are beneficial for the stock market investors to be aware of the effect of positive and negative psychological factors on their judgment on risk perception and investment decision making. Despite the claim that social media might strengthen the effect of psychological factors on investment decision-making, this was found to be insignificant in this research.*

Keywords: Risk-perception, stock markets, decision-making, investment, social media, cultivation theory

1. Introduction

The traditional finance theories suggest that investors' decision making is based their analysis of data and investor is fully rational while making investment decisions (Prosad et al., 2015). Moreover, the traditional finance theories indicate that the stock prices are expected to incorporate all the available information in the market and expected to be priced fairly. But with the presence of investment bubbles, overreaction and underreaction to any news in stock markets, behavioral finance theory indicates that investors are not only dependent on available data in the market, but also sentiments and emotions (Prosad et al., 2015).

The behavioral finance theory deals with the influence of psychology of investors in the investment decisions (Statman, 2014). This theory highlights the importance of psychological biases and their outcomes in decision making. Behavioral finance concept indicated that investors are both bias and there is a tendency for psychological manipulation (Statman, 2014).

Based on Shefrin (2006), psychological factors are affecting the investment decisions of investors, traders and financial commentators in media and currency exchange brokers. Moreover, past events, beliefs and preferences also drive investment decision making, which leads the investors to mimic what everyone else is doing and become irrational thinkers (Baker & Ricciardi, 2014). Psychological factors like anger, stress, positive mood and fear affected the investment decision making in stock markets (Abdul Moueed & Ahmed Imran, 2020).

On the other hand, social media has a framing effect that provides the mental filters, hence has also affected investment decision making among investors. Social media that occasionally stirs the issue on economic instability and political crises presented sentiments either positive or negative has affected the investors decision making in stock (Boda & Sunitha, 2018). However, frequently, investors are not aware of the influence of psychological factors and social media adverse effect on investors' risk perception while investing in stock markets. Unaware of this affects will eventually leads to poor decision making and potential of make losses (Li et al., 2020). Therefore, on top of the Behavioral Finance theory, this study is also conceptualized based on the Cultivation Theory, which says that people who follow media for long period believe the world as shown on media and this affects the audience thinking, behavior and attitudes.

To understand the factors that influence decision making in investment, this study aimed to examine how social media affect risk perception and how psychology factors such as anger, fear, positive mood and stress effect on investors' decision making while investing in Indian stock markets. Consequently, leads to the following research questions:

1) Do psychological factors (anger, fear, positive mood and stress) have a direct effect on stock market investment decisions among the Indian investors?
2) Do psychological factors (anger, fear, positive mood and stress) have a direct effect on risk perception on stock market investment decisions making among Indian investors?
3) Do risk perception mediates the relationship between psychological factors (anger, fear, positive mood and stress) and stock market investment decisions among the Indian investors?
4) Do social media moderates the effect of psychological factors (anger, fear, positive mood and stress) and risk perception on stock market investment decisions?

The findings of this study will confirm or refute the assumption about the social media effect on psychology and risk perception of Indian investors. Indian stock markets investors are the subject of the study. The reason being, Indian stock markets is the top-10 worlds' biggest stock markets in terms of capital. Thus, studying Indian stock markets provides some benchmark about how investor behave and can be useful for investors in the worldwide markets.

The next section discusses on the past researches in this area. Then, followed by the methodology used for data collection and data analysis. The next section will be discussing on the findings of the research and followed by conclusion.

2. Literature Review

2.1. Investment and media

Investment refers to use of funds with the objective of achieving additional income or growth in value (Deeksha, 2018). Investing ensures present and future financial security (Bridget, 2016). Increase in investments boosts aggregate demand which in turn fuels economic growth.

Various investments options like bank fixed deposits, recurring deposits, real estate, gold, governments bonds, stocks are available to investors. Stock market investment is one of the famous investment options. Buying a stock allows an investor to participate in the company's growth but it involves risk and can affect the future wealth management. Stock market investors must deal with risk, dynamic and uncertain environments (Lucey & Dowling, 2005).

Stock price analysis needs to be done using either technical indicators or fundamental indicators. Technical indicators are quantitatively derived from historical data of a stock. Support levels, resistance levels, exponential moving averages, stock price, trading volume etc. are some of the technical indicators. Fundamental analysis is derived from macroeconomic indicators, overall trend in an industry. Analysis of earnings, expenses, assets and liabilities is part of fundamental analysis and most of this data is of unstructured nature (Devi & Bhaskaran, 2015). Therefore, investors need to extract information from different sources and perform data analysis to predict the future performance of a stock.

Mass media, including newspapers and television play a vital role in distributing information, including stock market investors (Fang et al., 2009). Studies on the relation between media and stock market has been on the rise among researchers. Study by Klibanoff et al., 1998 argued that country-related news published on the first page of NewYork Times newspaper has affected the prices of close-ended country funds. Thus, the individual investors face difficulties in selecting a stock from a large poll of stocks in the market. Subsequently, individuals choose attention-grabbing stocks which are mentioned in the news (Chan, 2003).

Tetlock (2007) studied the content of the media and suggested that pessimistic content in media results in downward movement of a stock price. Another study by Tetlock (2008) suggested that negative words used in news predicts stock returns. Stock related messages in mass media predict market volatility. Companies with large advertising expenditures have more activity on their stocks (Grullon, Kanatas & Weston, 2004). Meschke (2004) found that stock price experience upward movement or reversal after CEO interviews on CNBC.

2.2. Social media and investors

In today's digital world, social media is a vital platform of communication, for create and share content. Out of 7.8 billion people on the planet, 4.5 billion use internets, while 3.8 billion people use social media. World's internet users spend cumulative 400 million years on social media in the year 2020 (Simon, 2020). Facebook, Twitter, Snapchat, Instagram are some of the present day famous social media platforms.

Social media has a significant role for providing information to investors, it has become a vital tool for investment decision making (Shakerin, Nair, Radha Sham, Rohana Wahab, Siti, 2018). There exists a significant relation between the information available in social media and stock market investment decisions. Popular social media, Twitter & Facebook, have significant influence on stock market prediction (Bollen, 2011). Top executive's direct communication on their personal social media account can influence the stock market. For example, the stock price of Tesla went up from $343 to $379 on August 7th, 2018 in response to the tweet on funding by Elon Musk, the Tesla CEO. Stocks with large social media attention have volatility and high trade volume in the next month. Compared to a stock with no social media buzz, the attention-grabbing stocks on social media experience an increase of volatility of about 50% and increase in trading volume by about 25%.

A firm's image on social media affects its stock prices. Investors who purchase stock of reputed firms make huge returns (Brammer, 2004). Social media usage in direct-assertive impression management has positive relation with a firm's financial performance (Schniederjans, 2013). Product recalls shared on Twitter and Facebook help lower negative

market response because it gives an impression that the firm is taking steps for damage control (Lee, Hutton, Shu 2015).

Communication behaviors of online community affects the stock market investment decisions (Shakerin et al., 2018). Investors leverage on the online communities to share information and opinions on stocks. Social media helps the investors to improve their financial literacy about stock markets (Eric Tham, 2018). However, a happy and calm mood on online communities have a high correlation with stock prediction (Devi & Bhaskaran, 2015).

2.3. Indian Stock Markets

Stock trade in India happens on two exchanges: the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE). Many companies are listed commonly both on BSE and NSE. Stock market capitalization of 50% and more of a country's GDP indicates a well-developed stock market. Stock market capitalization as percentage of Indian GDP stands at 75.81% in the year 2019. This number was 45.93% in the year 2003 and reached maximum of 149.1% in the year 2007 (Global economy, 2019).

BSE limited was established in the year 1875 and it is Asia's oldest stock exchange. In 1957, BSE was recognized under the Securities Contracts Regulation Act. In 1986, BSE SENSEX index was introduced to reflect the performance of the stock exchange. In the year 2000, derivatives market was introduced trading BSE SENSEX future contracts followed by BSE SENSEX options in the year 2001. Today, over 5000 companies are listed on BSE with over 5 crore registered investors (PTI, 2020). In the year 2019, BSE reached tenth rank in the world with market capitalization of 2056 Billion USD (Wikipedia, 2019).

National Stock Exchange (NSE) was established in the year 1992 with electronic trading system. Today, more than 1600 companies are listed on NSE and NSE reached eleventh position in the world with 2030 billion USD market capitalization (Wikipedia, 2019). NIFTY 50, a 50-stock index was started in 1996 by NSE.

2.4. Cultivation Theory

Cultivation Theory is the third-most frequently referred theory among the mass-communication journals (Bryant & Miron, 2004). Cultivation theory helps to explain how exposure to television, with repetition of images, can change our assumptions on the world (Riddle, 2009). In the 1970s, Gerbner and associates proposed 'cultivation theory' which alleged that people would grow more fearful and experiencing more subjective risk with an increased amount of TV viewing, as they would see the world more as it was on the screen than it was (Wahlberg & Sjoberg, 2000).

In recent development, the cultivation theory is used in explaining the effect of media in different settings. Hammermeister et al. (2005) analyzed the effect of TV viewing on psychosocial health of people who view TV for more than 2 hours per day and those who do not view TV at all. Shanon and Morgan (1999) analyzed the convergence of Television and the internet. This research argued that online news articles target specific audience by gathering their data and these act as extension to Television. Beullens et al. (2012) argued that the alcohol use in music videos affect the perception of the viewers towards alcohol. Behm-Morawitz and David Ta (2014) researched on the effects of video games, using cultivation theory, on White students' opinion on Black and Asian individuals. Anita Atwell Seate and Dana Mastro (2016) confirmed that negative messages in the news about immigrants influence anxious feeling towards the immigrants. All these studies indicate that exposure to media has an influence on ones' emotion and psychology.

On the other hand, Morgan et al. (2015) applied cultivation theory into computer media influence study. This research argues that the computer media use narrative and these affect the viewers. Croucher & Stephen (2011) applied cultivation theory to study the effect of social media on cultural adaptation This research has proved that the immigrants form a perception of the host country through social media before adapting to the culture of the host country. Mina Tsay-Vogel, James Shanahan, and Nancy Signorielli (2016) conducted a study using cultivation perspective, on the impact of Facebook on the perceptions of privacy, resulting in increased self-expression both in online and offline environments.

2.5. Conceptual Framework of Research

Based on the behavioral finance and cultivation theory, below is the conceptualized framework of the present study. Stock Market Investment Decision is the Dependent Variable (DV) and psychological factors, such as Anger, Fear, Positive Mood and Stress, are Independent Variables (IV). Risk Perception is the Mediator Variable and social media is the Moderator Variable.

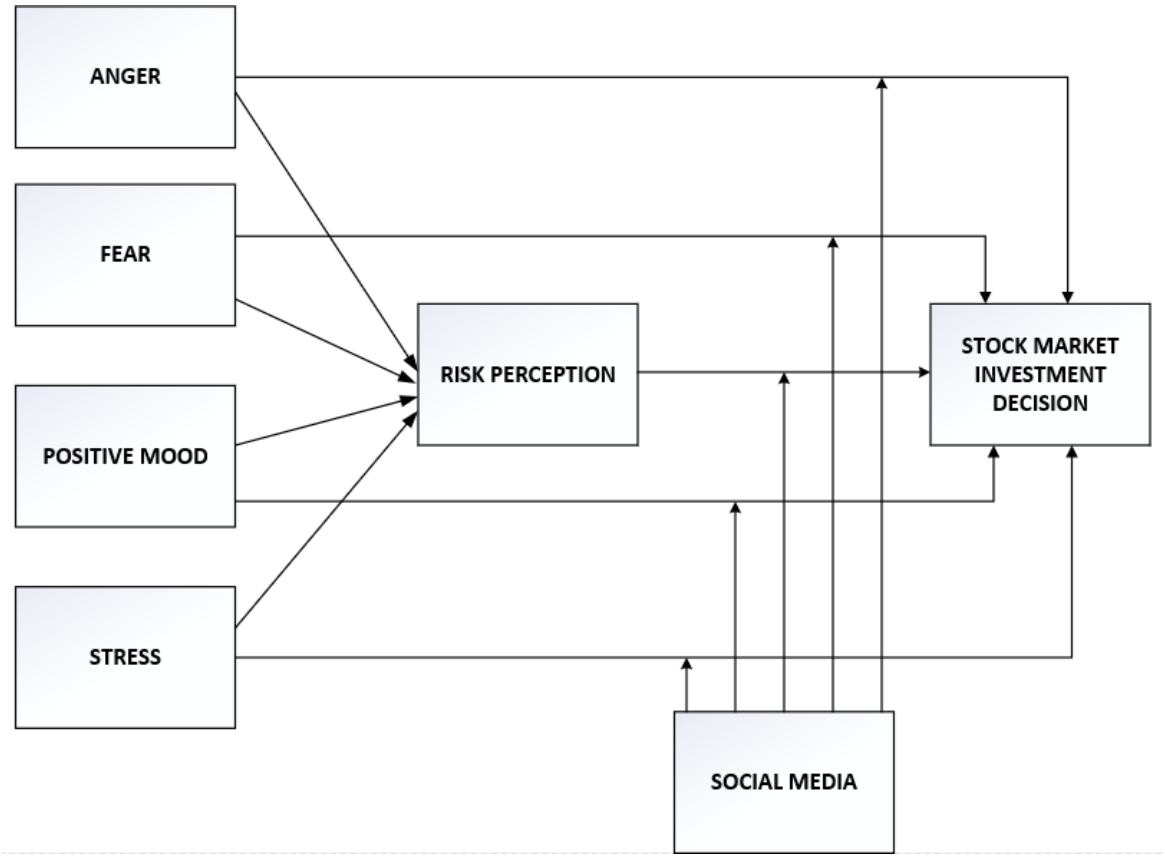

Figure 1: Conceptual Framework

2.6. Variables of Study

2.6.1. Stock market investment decision

For companies, stock markets give an opportunity to raise capital which in turn helps in growing their businesses and create jobs in the economy. For investors, investing in stocks is an opportunity to earn part of company (Han Tan, 2020). Some of the advantages that stock markets offer to investors are:

1) Gains: Historically, stock market investment returns outweigh the other investments such as bank deposits etc.

2) Diversification: Investors can invest in diversified stocks across various sectors and different geographical locations.
3) Income: Some stocks provide dividends as income though stock has lost value. These dividends can be reinvested and provide income.
4) Control: Investors have flexibility to choose which companies to invest. Moreover, investors can cast votes in company activities.

Historically, investments in Indian stock markets gave close to 12% annual returns while bank deposits gave 7% return and inflation was around 5% to 6% (Sugandha, 2019).

2.6.2. Psychological Factors

(a) Anger

Anger can have positive or negative outcome depending on the situation (Abdul Moueed & Ahmed Imran, 2020). Impact of anger on financial decision-making can be dramatic. Anger can cause improved analytical ability (Szasz, Hofmann, Heilman & Curtiss, 2016). Gambetti and Giusberti (2012) explored the effect of anger in financial investment by conducting research on 214 working adults.

(b) Fear

Fear of losses can inhibit investments in stocks, even though generally stock market gives higher expected returns (Benartzi & Thaler, 1995). Individuals favor investments in which they have knowledge and are biased to choose investment options that are close to status quo (Cao, H. & Han, Bing & Hirshleifer, David & Harold, 2007).

(c) Positive Mood

People read their feelings before taking a decision and positive mood results in more favorable decisions (Schwarz & Clore, 2003). Positive moods show good effects on problem solving, reasoning and decision making (Isen, 2001). Positive mood leads to efficient thoughts and it encourages variety seeking (Pham, 2007).

(d) Stress

Stress might hamper the ability to take financial decisions, where rational and deliberate thinking is essential (Porcelli & Delgado, 2009). Study by Porcelli and Delgado (2009) suggested “reflective-effect” in financial decisions under stressful conditions, whereby conservative choices are reported in decisions related to “profit” choices and risky decisions are reported in “loss” choices.

2.6.3. Risk perception

Risk perception in investment is influenced by media and/or an investor’s lack of knowledge. How an investor feels the extent of risk associated with a behavior contributes in risk-taking behaviour (Sitkin & Pablo, 1992). Risk perception is a cognitive activity involving the analysis of external and internal conditions (Roszkowski & Davey, 2010).

2.6.4. Social media

Social media is a major platform for communication and information sharing. Facebook, Youtube, Pinterest, Instagram, Twitter, Snapchat and LinkedIn are some of the famous social media platforms. Close to 4billion users worldwide use social media. India has close to 300million users (Sandhya, 2020). Companies use social media for brand reputation and to work with stakeholders. In recent times, stock investments are no longer based on financial

statements. Information on social media, though may be inaccurate sometimes, are guiding the investor's stock market investments (Hoteit, 2015).

2.7. Hypothesis Development

2.7.1. The Effect of Psychological factor on stock market investment decisions

In stock investment, anger predicts risky decisions and is positively associated with investing in different kind of stocks. Another study on 288 university students suggests that angry people are more interested to invest in stocks (Bernaola, Willows & West, 2020). Literature suggests that fear in financial decisions drives investors either to maintain status quo or drive more investments. Fear can drive people to avoid losses by diversifying their investment portfolio in the stocks (Abdul Moueed & Ahmed Imran, 2020). Study on U.S stock market suggests positive mood positively affects decision making under risk (Gabriele, 2015). People in good mood make more optimistic judgements about equities (Dowling, Lucey, 2004). A study on 47 healthy volunteers suggests that stress directly affects the financial decision-making (Robinson, Bond & Roiser, 2015). Study by Preston, Buchanan, Stansfield, and Bechara (2007) report gender differences in financial decision making under stress. This study suggests female participants performed well in Iowa Gambling Task (IGT) than male participants. Laboratory study confirms that under stressful conditions, participants are less interested to explore all available options (Liam, Fink, Harmon, 2014). The above discussion on psychological factors and stock investments leads to the hypothesis:

H1: Anger positively affects stock market investment decisions.
H2: Fear positively affects stock market investment decisions.
H3: Positive mood positively affects stock market investment decisions.
H4: Stress negatively affects stock market investment decisions.

2.7.2. The Effect of Psychological factor on Risk Perception

People with anger-prone temperament interpret high familiarity and so take greater risks. Gambetti and Giusberti (2009) study found anger to be positively related to mortgage risk and prefer adjustable interest rates. In three out of four studies done by Lu, Xie and Ruogu Zhang (2013), it was found that both anger and fear positively affect the risk perception. Fear increases risk perception in a subsequence situation (Lerner & Kelner, 2001). Fear influences investor's risk perception and it affects their rational decision making (Lee & Andrade, 2011). Mood is a transient affective state that can show dramatic influence on a person's daily life. Positive mood helps in gathering more information about a situation and this greater familiarity reduces the perceived risk (Slovic, Fischhoff, & Lichtenstein, 2005). A study in mid-western USA suggests that a positive mood leads to higher risk tolerance (Grable & Roszkowski, 2008). Positive mood helps to assess the investment option properly according to risk and return criteria (Sushmita, Brijeh, Aneesya & Avnish, 2020). Exposure to stress is proved to influence risk-taking in financial decisions. Individuals under stress take riskier choices due to increase biases and lower-level processing (Porcelli & Delgado, 2009). People in the stressed condition perceive the risk as higher in comparison to controlled condition (Sobkow, Traczyk & Zaleskiewicz, 2016). Stock trader's risk-taking behavior might be affected by the stress hormone cortisol (Joseph Stromberg, 2014). Thus, the above discussion leads to the following hypothesis:

H5: Anger positively affects stock market investor's risk perception.
H6: Fear positively affects stock market investor's risk perception.
H7: Positive mood positively affects stock market investor's risk perception.
H8: Stress negatively affects stock market investor's risk perception.

2.7.3. The Effect of Risk perception on investments

Nosic and Weber (2010) conducted a study to measure risk perception in financial domain using lottery approach with cash prize. This study concluded that risk taking in investment is affected by risk perception and expected profits. Another study on 151 investors in Bahrain concluded that financial portfolio management is depends on risk perception. There is direct relation between risk perception and investment behavior of employees while investing in their organization's stocks (Shafi, Akram, Hussain, 2011). Rian and Hunjra (2015) and Abdul Moueed & Ahmed Imran (2020) conducted studies on effect of risk perception between psychology and investment decisions. Thus, the above discussion leads to the following hypothesis:

H9: Risk perception positively affects stock market investment decisions.

H10: Risk perception positively mediates between Anger and the stock market investment decisions.

H11: Risk perception positively mediates between Fear and the stock market investment decisions.

H12: Risk perception positively mediates between Positive Mood and the stock market investment decisions.

H13: Risk perception negatively mediates between Stress and the stock market investment decisions.

2.7.4. The moderation effect of social media on anger and investment decision making

A study on 2,00,000 users of Chinese social media service found that anger messages were more likely to spread faster compared to other emotions (Christina, 2013). Stock price of companies which faced anger on media, like Facebook for data breaching, Volkswagen for emission scandal, outperformed their peers in the following year (Richard, 2018). The above discussion on anger, social media and stock investments leads to the hypothesis:

H14: social media moderates the effect of anger on stock market investment decisions.

2.7.5. The moderation effect of social media on fear and investment decision making

Fear of Missing Out (FOMO) refers to the feeling of missing out on fun, experiences that make their life better. People with FOMO think that others are enjoying than they are (Thompson, 2011). FOMO drives people to invest in stock market (Sunny, 2020). When someone misses a market rally, it is with FOMO they will enter the stock market without having much knowledge. Facebook, Snapchat, Twitter & Instagram are associated with FOMO (Kyla, 2016) (Krasnova, Wenninger Widjaja, Peter, 2013) (Ayoko, 2019). Millennials use of social media is affecting their investment decisions as they are exposed to FOMO than previous generations (Ben Stupples, 2018). Social media provide many benefits for investors, platforms like e-Toro allows users to copy other investors' decisions. Apart from advantages to the investors, social media can provide opportunities for fraudsters. Fraudsters can indulge in spreading false and misleading information about a firm and eventually affecting its stock price (SEC, 2015). The above discussion on fear, social media and stock investments leads to the hypothesis,

H15: Social media moderates the effect of fear on stock market investment decisions.

2.7.6. The moderation effect of social media on positive mood and investment decision making

Literature suggests that social media platforms like Facebook, Twitter help reduce the stress and can create positive mood. Study on university confirms that Facebook is helpful for depressed user (Ellison, Steinfield & Lampe, 2007). Intense Facebook use positively affects

students' life satisfaction, civic engagement and social trust (Valenzuela, Park & Kee, 2009). Study on 1027 American adults suggests that long term use of social media leads to social well-being (Bekalu, McCloud & Viswanath, 2019). Social media when used to stay in touch with people helps in reducing depression (Bessiere, Pressman, Kiesler & Kraut, 2010). The above discussion on positive mood, social media and financial decisions leads to the hypothesis,

H16: Social media moderates the effect of positive mood on stock market investment decisions.

2.7.7. The moderation effect of social media on stress and investment decision making

Social media platforms like Facebook, Instagram, Snapchat, Twitter can help strengthen social ties, but there is proof that such platforms lead to stress (Kathleen, 2019). Prolonged use of social media leads to depression, anxiety and stress (Reilly, Dogra, Whiteman, Hughes, Eruyar & Reilly P, 2018) (Reilly. M, 2020). People are getting more addicted to social media (Robert, 2019). Checking the viral content on social media is affecting the quality of sleep and this affects the productivity next day. People try to copy other's characters with whom they interact on social media. This results in stress in some cases, for example copying other's lifestyle may create stress on financial position (Lena, 2019). The above discussion on stress, social media and financial decisions leads to the hypothesis,

H17: Social media moderates the effect of stress on stock market investment decisions.

2.7.8. The moderation effect of social media on Risk Perception and investment decision making

Some of the recent studies apply cultivation theory in explaining the effect of social media on risk perception. Study by Ruixia Han and Jian Xu (2020) confirms that social media affects pro- environmental behavior through environmental risk perception. Dingde Xu, Zhuang, Xin Deng, Qing and Yong (2020) explored the effect of earthquake information in the media on the disaster risk perception. The findings of the study by Choi et al. (2017) shows that social media positively affects the risk perception of MERS disease. The above discussion leads to the hypothesis,

H18: Social media moderates the relation between risk perception and stock market investment decisions.

3. Methodology

3.1. Sampling

In this study, the sampling involves investors in Indian stock market. The sampling strategy used is convenience sampling and snowballing sampling, where sampling is done from a group of people who are convenient to respond to the survey and they are requested to share the survey among their contacts. Following the G* Power analysis with 0.05 significance level as 0.8, the minimum number of sample size for this study is 146. However, in total 230 data samples are collected, among which 171 samples are valid and considered for further analysis.

3.2. Survey Questionnaire

The survey questionnaire consists of three parts. Section A seeks to know the demographic information of the respondent such as gender, age, marital status, salary range and education. Section B seeks information on social media usage and stock market investment. Section C measures the variables of the theoretical framework. Some of the questions are adopted from the study done by Abdul Moueed & Ahmed Imran (2020) on stock market investments. Each item is measured on a five-point Likert scale from Strongly Disagree (1) to Strongly Agree (5).

Pre-testing of the questionnaire is done by content validity and face validity. Content validity is tested by giving the questionnaire to academicians who are expert in financial markets. No issues are pointed out related to clarity of words, readability, and adequacy of the questionnaire for the intended measurements. Face validity is tested by sending the questionnaire to three stock market investors and asked them to give feedback on whether the questions are designed properly.

4. Findings

4.1. Respondents' Profile

Online questionnaire survey was conducted among the individual investors in Indian stock markets. After elimination invalid responses, a total of 171 responses were used for further analysis. Majority respondents were from age 21-30 years (43%), 94% were Male, 40% were bachelor's degree holders while 56% were master's degree holders. All the respondents are full-time employees with 25% earning less than 5 Lakhs and 30% earning 5-15 lakhs of Indian rupees per year. 89% were married while 82% were unmarried. Table 1 shows the respondents' profile.

Table 1: Respondents' Profile

Variables		Frequency	Percentage
Age Group			
	21-30	74	43.27
	31-40	72	42.1
	41-50	18	10.52
	51 & above	7	4.09
Gender			
	Male	162	94.73
	Female	9	5.26
Education			
	Diploma	1	0.58
	Bachelor's Degree	70	40.93
	Master's Degree	96	56.140
	Doctorate	4	2.33
Employment Status			
	Full Time	171	100
	Part Time	0	0
	Retired	0	0
Yearly Income (Indian Rupee)			
	< 5 Lakhs	44	25.73
	5-15 Lakhs	52	30.40
	15-25 Lakhs	34	19.88
	> 25 Lakhs	41	23.97
Marital Status			
	Married	89	52.04
	Single	82	47.95

4.2. Partial Least Square Analysis

The data collected from the survey was analyzed using Smart PLS version 3.2.2 to test the hypotheses via the partial least squares approach (Ringle, Wende, & Becker, 2015). Since theindependent variables are higher order constructs, Smart PLS is suitable to analyze such models(Ringle, Sarstedt, & Straub, 2012). PLS-SEM is a two-step process whereby the measurementmodels and the structural model are evaluated separately. Firstly, the reliability and validity ofthe measures are assessed according to the criteria for formative and reflective specifications. Only those measures that sufficiently represent the constructs must be used to examine the structural relationships in the model. Next, the structural model estimates are assessed when the above measures are considered significantly adequate to perform such assessment. Beforeusing PLS, the data was tested for common method variance using Harman's one-factor test using SPSS software. For the collected data, the total variance explained by any single factor was 32%, which is less than the threshold of 50% (Podsakoff, Mackenzie & Lee, 2003).

4.2.1. Internal Consistency and Convergent Validity

The measurement model assessment was done using internal consistency reliability, convergent validity, and discriminant validity tests. The factor loadings for all measurement items, Cronbach's Alpha, composite reliability, and average variance extracted (AVE) of the first order constructs are shown in Table 2. Based on Table 2, The outer loadings for the measurement items are above 0.7 (Hair Jr, Hult, Ringle, & Sarstedt, 2016), except for A4, A5, F1, F2, F4, M3, M4, M5, S1, S3, S5, S6, S7, RP2, SM4, SM5, SMID2, SMID3 and SMID6. The items with outer loadings below 0.7 are removed for further data analysis. Cronbach's alpha coefficient was chosen as the tool to measure internal consistency and reliability as this study had multiple Likert questions.

The larger Cronbach's alpha (CA) coefficient implied the possibility of measuring same concept and covariance were higher (Chelsea, 2015). As a rule of thumb stated by Ursachi, Horodnic, & Zait (2015), CA value ranged between 0.6 to 0.7 were satisfactory reliability result, 0.8 or above indicated very goodlevel of internal reliability. Based on Table 1, all constructs in this model exceeded this requirement except the variable Stress, implying there were consistent responses for items in the questionnaire.

The composite reliability (CR) of all the constructs is greater than the threshold of 0.7 (Hair Jr et al., 2016), which means that the items measure the constructs reliably. The average variance extracted (AVE) for all the constructs are greater than the minimum threshold of 0.5 (Hair Jr et al., 2016).

Table 2: Measurement Model Results

Constructs	Items	FL	CA	CR	AVE
InvestmentDecision (SMID)	ID1	0.771	0.667	0.818	0.600
	ID4	0.810			
	ID5	0.741			
Social Media (SM)	SM1	0.801	0.814	0.877	0.641
	SM2	0.844			
	SM3	0.824			
	SM6	0.727			
Anger (A)	A1	0.773	0.880	0.910	0.631
	A2	0.874			

	A3	0.878			
	A5	0.657			
	A6	0.737			
	A7	0.824			
Fear (F)	F3	0.859	0.747	0.886	0.795
	F5	0.923			
Positive Mood (P)	M1	0.839	0.629	0.843	0.729
	M2	0.869			
Stress (S)	S2	0.887	0.536	0.807	0.678
	S4	0.754			
Risk Perception (RP)	RP1	0.745	0.787	0.876	0.704
	RP3	0.906			
	RP4	0.858			

4.2.2. Discriminant Validity

The heterotrait-monotrait (HTMT) ratio of correlations approach was performed to examine whether the constructs discriminate well empirically (Henseler, Ringle, & Sarstedt, 2015). Asshown in Table 3, the HTMT ratio for all the constructs is less than the threshold of 0.85. So, we can conclude that all the constructs are different from each other and the items are good measurement of the constructs.

Table 3: HTMT (0.85)

	1	2	3	4	5	6
Anger (1)						
Fear (2)	0.151					
Investment Decision(3)	0.369	0.270				
Positive Mood (4)	0.254	0.124	0.569			
Risk Perception (5)	0.394	0.135	0.888	0.596		
Social Media (6)	0.595	0.150	0.499	0.263	0.384	
Stress (7)	0.588	0.101	0.634	0.681	0.572	0.514

4.3. Structural Model Analysis

Smart PLS software was used to test the hypothesis of this study after obtaining adequate measurement model and multicollinearity results. To assess the structural model, the path coefficient, t-statistics, P-values, and the Coefficient of Determination (R2) were used for thisstudy. PLS bootstrapping resampling of 5000 method was used to test the significance of all the paths in the research model.

4.3.1. Path Estimates

Tables 4 presents the output from the bootstrapping analyses done in Smart PLS software. According to Table 4, the direct effect of the psychological factors during the stock market investments is not supported and the moderating effect of social media on the psychological factors during the stock market investments are not supported. The mediation effect of risk perception on the anger and positive mood during stock market investment is supported.

Table 4: Structural Model Result (alpha=0.05)

Hypotheses	Relationship	t-stat	p-value	Decision
Direct Effects				
H1	Anger → SMID	0.520	0.603	Not supported
H2	Fear → SMID	0.818	0.413	Not supported
H3	Positive mood →SMID	1.020	0.308	Not supported
H4	Stress → SMID	1.149	0.251	Not supported
H5	Anger → Risk Perception	2.956	0.003	Supported
H6	Fear → Risk Perception	1.281	0.200	Not supported
H7	Positive Mood → Risk Perception	4.522	0.000	Supported
H8	Stress → Risk Perception	1.984	0.047	Supported
H9	Risk Perception → SMID	6.034	0.000	Supported
Indirect Effects				
H10	Anger-> Risk Perception → SMID	2.521	0.012	Supported
H11	Fear -> Risk Perception → SMID	1.240	0.215	Not supported
H12	Positive Mood→ Risk Perception → SMID	3.449	0.001	Supported
H13	Stress → Risk Perception → SMID	1.946	0.052	Supported
Moderation Effects				
H14	Social Media moderates Anger on SMID	1.786	0.074	Not supported
H15	Social Media moderates Fear on SMID	1.006	0.314	Not supported
H16	Social Media moderates Positive Mood on SMID	0.502	0.616	Not supported
H17	Social Media moderates Stress on SMID	0.148	0.882	Not supported
H18	Social Media moderates Risk Perception on SMID	0.514	0.607	Not supported

5. Conclusion

This study fills the research gap in existing literature on exploring the effect of social media in Indian stock market investments from psychology and risk perception perspective. Firstly, the findings demonstrate that psychological factors such as anger, fear, positive mood, and stress do not directly affect the stock market investments among Indian investors. Secondly, anger, positive mood, stress effect on stock market investments with risk perception playing mediating role. Thirdly, social media does not play a role on psychological factors and risk perception while investing in Indian stock markets. According to behavioural finance theory, investors are not always rational. There could be several factors such as psychology, risk perception and social interaction on an investment decision. The results of the study help stock market investors to be aware of the effect of psychology and social media on their investment decision. This will be beneficial for the individual investors to avoid wrong decisions in stock markets. Apart from the individual investors, these findings help guide the shareholders, fund managers and financial advisors in making right investment decisions in stock markets.

Despite achieving it objectives, this study has few limitations. Firstly, this study has been conducted during the Covid-19 pandemic. The Covid-19 pandemic has shown negative effects on people's psychology and the investors thought process might be different while completing the survey questionnaire. Secondly, only 171 data samples are collected for this study. Future studies need to conduct similar survey on a greater number of investors. Thirdly, there is need to explore if demographics such as age, gender, education has any effect in finding the effect of social media on psychology and risk perception during stock market investments. Moreover, 94% of the respondents are male, future studies can include a greater number of females in the survey. Furthermore, all of the respondents have full-time job. There is a need to find whether part-time job holders and retired people show different results. Finally, it would be interesting to conduct this study on stock markets in other developing countries, to confirm whether the result is consistent with the findings of this study.

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