PSYCHOLOGY OF INVESTMENT-SENTIMENTAL BASED LITERATURE REVIEW

Kanwal Nayan Kapil, Management Development Institute Gurgaon India

ABSTRACT

Considering the market-based approach, the purpose of this paper is to do sentimental based literature review. gauged sentiment components have been studied to study the influence of sentiments on the Stock Market variables. Researchers have checked the significance of sentiment components in forecasting the the index return. In Indian context the index is CNX Nifty Index & Nifty returns. Researchers have tried to gauge the investor sentiments after separating the fundamental component from the proxies. There are several defined number of proxies used in previous literature. Out of which three proxies are quite popular. Firstly, OLS regression along with newey-west method has been used to capture the impact of sentiments present in proxies on the dependent variables . Researchers have studied how Sentiment Index is constructed with same three proxies, using Principal-Component Analysis, in order to remove idiosyncratic components, present in the proxies & to capture the common sentiment component present in proxies. In several studies newey-west method and Granger Causality test are conducted to check the influence of sentiment index on dependent variables and to study the nature of causality among them, respectively.Studies have found that constructing the sentiment index is a better way of gauging the common sentiments prevailing in the market as it doesn't account for the idiosyncratic/proxy-specific components present in the proxy variables. And Granger Causality results depict the bi-directional causality among the dependent variables and sentiment index. Therefore, the sentiment index thus formed is capable of forecasting the dependent variables. Overall the researchers have utilized that sentiment component with two different approaches to study the impact of sentiments on stock market variables and deciding which of the two approaches, can serve the purpose more accurately.

Keywords: Stock Markets, Market-implicit Proxies, Sentiment Index, Principal-Component Analysis.

INTRODUCTION

As per the traditional finance theories, investors tend to make investment decisions based on certain criterion which had their own significance in the financial world. Over the years, various path breaking theories have evolved with their contribution towards investment decision-making strategies, namely; the EFFICIENT MARKET HYPOTHESIS (EMH) by Eugene Fama (1970), which states the relevance of all the available information while pricing of assets as information is reflected through asset prices. The implication of this theory is that by adjusting for risks consistently won't be enough to beat the market as price of market assets can only be affected by the new information. Other than this, Markowitz's THEORY OF PORTFOLIO SELECTION (1952) & William Sharp's (1965) theory of classical CAPITAL ASSET PRICING MODEL (CAPM) have their own importance in the field of traditional finance. The two main assumptions which had been the building block of various financial

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theories are; First, investors are rational towards their investment decisions. Secondly, investment decisions are made in such a manner that maximum amount of risk could be avoided. Even if, an investor takes some risk then it is always the case that he/she expects higher returns. Hence, it won't be wrong to say that above mentioned theories along with many others are based on these two major assumptions in the world of traditional finance.

In later years, it was found that there are certain issues which cannot be resolved through the traditional theories. The EMH & the rational expectations couldn't explain the returns from stocks & the behaviour of investors regarding the trading volumes in the developed as well as the emerging markets. A new form of finance, popularly known as behavioural finance started gaining importance which simply emphasized on the fact that, investors cannot be rational all the time. Irrationality in investors' decision making is in fact, inevitable. This group of researchers focussed on the fact that investors can't be utility maximisers all the time and too are prone to certain behavioural & cognitive biases/errors. Behavioural finance studies the impact of psychology on the investors' behaviour as well as how these behavioural biases impact the traditional decision making. Investors could be optimistic, pessimistic, overconfident, lack self-control as well while decision makings.

Behavioural Finance possess certain traits,

- Investors should be treated as "normal" instead of being treated as "rational".
- Investor decisions are influenced because of their own biases.
- Self-control while making decisions can be limited, at times.
- Their wrong decisions are results of the cognitive errors they committed.

According to Shleifer & Summers (1990) and later explained by Barberis & Thaler (2003) cognitive psychology & limits to arbitrage are the two building blocks of behavioural finance. Psychology looks at the set of factors that can affect the investors' investment decisions while the second pillar of limits to arbitrage assumes that arbitrageurs are incapable of reducing or eliminating the possibility of mispricing every time as it is suggested by EMH.

Psychology gained significant attention when there had been certain international stock markets crashes, namely;

- The Black Monday (October 1987)
- Asian Crisis (1997)
- The Dotcom Bubble Burst which lasted from March 2000 till October 2002
- The Global Financial Crisis.

All of these events won't have reached at such severe level if the investors had been rational in decision making. This implies that investor sentiments are capable of inducing systematic risk & too can affect the price of assets in equilibrium. Therefore, certain degree of irrationality in investor's decision-making can impact economy and financial markets on large extent.

Also, as per the asset pricing model, there exists a correlation between the market related risks (usually called as market beta) and the returns from the stocks. But later, there were situations when researchers were emphasizing on the size of the market, firm's common stocks' book value, other idiosyncratic risks and various other dimensions which too had their influence over the returns on investment. Therefore, traditional theories failed to explain such phenomenon & another school of thought in this field had become a necessity.

In this regard, various authors have come up with their different approaches to explain

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the impact of investor sentiments on different elements of stock markets (i.e., trading volumes, market returns, stock prices etc). Some authors have tried to perform empirical analysis on a macro scale. Baker & Wurgler (2007) through their most influential work by creating a sentiment index & utilizing "top-down" approach tried to measure the aggregate investor sentiments' impact on the stock returns. Their results are capable of challenging the traditional finance theories which ignored the presence of investors' sentiment in the cross-section of stock prices. Hence, they got success in proving that cross-section of stock prices is actually & significantly impacted by investors' sentiments. Not only this, there are various other authors, who tried to explain the functioning of human psychology, their feelings and sentiments through the foundations of "animal spirits" which came into picture because of John M. Keynes (1936) in his "The General Theory of Employment, Interest and Money". There are research papers which suggest that human psychology is the driver of any economy & this also stands true for the financial markets. While other set of authors have tried performing their analysis through survey-based measures in which primary data is collected via questionnaires to have a better understanding of individual's views towards the investment decision they are making. The third method of studying the investor sentiments includes event-based studies in which authors analyze how & why a certain event had its impact on the stock markets. Certain events in Indian stock markets which led to market crash includes; Harshad Mehta Scam (1992), Demonetization (2016), Corona virus pandemic (2020) etc. Likewise, there can be other ways too, for capturing investor sentiments & their impact on stock markets.

Even though investor sentiments are not easily observable & quantifiable but identification of appropriate proxies & quantification of impact of sentiments on the asset prices has its own importance. Therefore, it provides immense opportunity to study investor sentiments as an important area for research in the field of finance. Since, the research work considers the Indian Stock Market, the section below briefly explains what all factors can play a role in driving the Indian Stock Markets.

Factors Affecting Indian Stock Markets

In today's global economy stock markets are considered as one of the most vital sectors.

As per the report from World Bank, in 2015 the ratio of Annual Stock to GDP was 55.2%.

Many people, group of researchers, policy makers and analysts consider stock markets as the fastest growing and emerging markets of the world. India is also, one of those countries where the contribution of stock markets to growth and GDP of the economy is really high. Nowadays, stock trading has become much easier and convenient because of online trading boom. In addition to this, there is little less risk of manipulation in stocks by brokers because of the transparency involved. Investors have much faith in stock markets now. Although, risk of stock market investments still prevails because of bunch of factors affecting the stock prices, dividend premiums, causing volatility in the stock market etc. Theoretically, company's performance should be the only reason behind fluctuations in the stock market but in the real-world theories have just been a matter of fundamental setup. In reality, there are factors affecting stock markets other than company's performance.

Price Rigging: Generally, stock markets are the matter of making money. That's the reason why scammers are attracted to it. Price Rigging is one of the illegal actions taken by scammers

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like; Harshad Mehta & Ketan Parekh in order to earn more profit at expense of other consumers/investors by inflating the market price of stocks and creating an illusion in the stock market.

Regulatory Actions: The way in which stock markets are regulated and monitored plays an important role in gaining or losing investors' trust. SEBI, being the regulator of Indian stock markets ensures transparency in the market. The regulator has introduced discount brokerage and various other initiatives in order to increase participants in the market.

RBI Monetary Policy: Time to time, the central bank keeps on revising repo rate & reverse repo rate on basis of which level of liquidity in ensured in the economy. The changes in policy made by RBI has its own implications on the stock markets in India.

Market Sentiments: Market participants don't follow the fundamentals, they follow herds. Price declination means soon traders and speculators on larger scale are going to sell their stocks which may further leads to price decline of a particular stock. Likewise, there are many other behavioral factors affecting stock markets.

Weather Conditions & Natural Calamities: Bad weather doesn't create chaos only in commodity market, it has its impact on stock markets too. Likewise, earthquakes, droughts, cyclones, floods and various other natural factors does create a mess in the stock market.

Political Scenarios & Government Policies: Soon after election results are announced a change in stock prices can is visible. Elections have their impact on the fluctuations in market prices. Also, policies formed by government do have impact on the economy as a whole. Since, stock markets are major constituent of the economy the policies like; GST, Demonetization, Budget announcements have their impression on the market prices.

Company Announcements: As per various announcements made by company regarding dividends, bonus, split or just a management change, investors' reactions can be experienced in the stock markets.

Global Incidents: Any kind of global event has its impact on the stock market prices. Example - oil crisis, change in export-import policies, wars etc.

Out of all these factors affecting the stock markets, the focus of our research work focuses on the market sentiments and how sentiments have their influence on the stock markets.

Market Psychology

Fundamentals drive market activity, but investor sentiment can override fundamentals, pushing markets, or individual stocks or sectors of the market, in unexpected directions. Sometimes, investment decisions and trading opportunities don't rely upon fundamentals. Financial and technical analysts use various indicators like; trend and patterns to analyze the state of market psychology. Economist Amos Tversky and psychologist and Nobel prizewinner Daniel Kanheman through their work pioneered the field of Behavioral Finance. Their Prospect Theory which counters the expected utility theories and very well explained how

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individual actually assess their perspectives towards their losses & gains asymmetrically. Till now, their work on stochastic errors in individual decision making which includes anchoring, loss aversion etc are widely accepted in the area of finance & are applied in trading, investing as well as portfolio management strategies. Now-a-days, stock markets are considered as a major source of wealth creation. Investors/traders look for opportunities to create their wealth. But these investing and trading approaches don't rely on fundamental assessment all the time. Analysts use trends, market indicators, patterns etc to predict the position of the market. Various investing decisions rely on taking the advantage of shifts in psychological patterns of market in order to generate profits and create wealth.

LITERATURE REVIEW

For several decades, traditional finance theories existed in the economy which worked on the principle of market efficiency & rationality of investors i.e all the investors in financial markets are rational. Hence, investors conduct their investment decisions & maximize their wealth. In other words, markets themselves are efficient enough to fulfill its requirements and any kind of externality whether positive or negative doesn't have its impact on the decision-making process. Such assumptions meant that markets will be less volatile in terms of returns, trading volumes and other factors in the financial markets. These theories also assumed that investors can offset any mispricing in the asset markets with the help of unlimited arbitrage opportunities. This theory given by Eugene Fama (1970) was one of the most celebrated theories in the field of finance and is popularly known as Efficient Market Hypothesis (EMH).

Despite this, there were situations when EMH failed due to lack of explanation for the volatility in trading volumes & stock returns, both in developed as well as emerging markets. One of the examples of failure of EMH includes, January Effect which reveals the abnormality in the distributions of returns in the month of January, in which the mean returns are significantly higher than in the remaining 11 months of the year. Likewise, there had been number of researches which challenged the EMH & tried to target the deficiencies of the hypothesis. The main challenge targeted the rationality of investors, where researchers tried prove that investors, in some cases are biased in their decision making as a consequence of which, there are occurrence of unfavorable outcomes.

There exist certain inconsistencies on the market, solutions to which stand unanswered in the traditional finance theories. Such inconsistencies include; Size effect, shown by Banz (1981) tells that the stocks which, on average have smaller market capitalization, gain larger risk-adjusted returns than those with large market capitalization , financial distress i.e. firms with higher possibility of financial distress, might have lower expected returns showed by Campbell et al (2008), total accruals, the firms which carry huge level of accruals make significantly lesser returns than those who have lower accruals, as argued by Sloan (1996), etc.

The controversies of EMH made inclusion & incorporation of behavioral and psychological factors in the macro-economic models is a necessity because, humans cannot be rational all the time. Individuals are prone to behavioral biases. Now came the time when most of the researchers went back to Keynes' The General Theory of Employment, Interest & Money (1936) which encouraged the field of behavioral economics. The theory simply turned the importance from rationality to the irrational behavior and psychological factors. Following this trend many authors in one way or the other tried to incorporate behavioral biases in their works to prove that actually, it is human psychology which drives the economy.

Amongst many, Shiller (1981) argued that investment decisions cannot be made out of

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rationality all the time. Therefore, stock prices are even impacted by factors other than fundamental values. Similarly, work done by Tversky & Kahneman (1979) popularly known as the Prospect Theory, too proved that decisions taken is not always optimal. Individual's choices determine his/her willingness to take risks. Tversky & Kahneman theory again supports the fact that fundamentals are not only the basis on which investment decisions can be made. Black (1986) & De Long et al (1990) believed that anomalies in the markets are can also be caused by traders who react to the noise in the market & are popularly, known as Noise Traders. According to Black, noise traders don't have access to inside information & hence, they act irrationally. As per theoretical work of De Long, investor sentiments are an intrinsic factor which can impact the prices of assets in equilibrium. In literature, theory of "Noise Traders" suggests that if some investors react to noisy signals and take investment decisions on the basis of such signals which are unrelated with fundaments then the value of assets gets deviated from their intrinsic value. Thus, investor sentiments are capable of impacting stock returns and the market volatility. On the other end, De Long et al 1990 also argued that the influence of noise traders can be reduced tremendously, if rational arbitrageurs enter in, in order to balance the irrational activities of noise traders. But the rational activities of the arbitrageurs are limited because of huge cost to arbitrage, that prevents the rational arbitrageurs to enter after certain extent & consequently, limits to arbitrage causes price of securities to move away from fundamentals. Influenced by the noise trader model more researches like; Brown & Cliff (2004), tried to offer prominent proof of investors' sentiment existence and its relationship between with the stock market return, mispricing & market volatility.

Now, researchers in the field of behavioral finance started focusing on finding answers to the criticisms & challenges raised against the traditional finance theories. Therefore, a conclusion occurred that financial models should no longer assume that all investors are rational.

One of the findings in the field of behavioral finance is also states that a certain proportion of the returns & volatility in the stock markets is attributed to investors' moods and emotions. For example, Wright and Bower (1992) through their research claimed that there exists a direct link between stock prices and mood of investors. During good moods, investors are much more optimistic about their investment decision-making process & vice-versa.

Andrei Shleifer (2000) in his book Inefficient Markets: An Introduction to Behavioral Finance mentioned behavioral finance as an alternative approach, in order to study the financial markets. He mentioned that psychological factors contradict the assumptions of investor's rationality & that of perfect arbitrage. The book worked as a foundation for various other theories and fundamentals that actually work for real-world analysis. Just like the work of Barberis and Thaler (2003), researchers should incorporate the two main attributes of behavioral finance i.e., psychology and the limits of arbitrage.

Behavioral finance has raised various questions on the individual's rationality in financial markets. Number of studies suggested, individuals being subjected to cognitive biases. There are situations where the individuals are overconfident about their judgment & to overestimate their abilities of decision-making. As per Akerlof & Shiller (2009), human psychology is the driver of economy in one way or the other. This research work is limited to psychological factors affecting the economy and stock markets specifically.

Behavioral Biases

There are various types of biases associated with the behavioral finance theory. An

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individual may neither have the ability nor time to arrive at an optimal decision when it comes to stock markets or any investment-decision. They tend to make best decisions on their behalf just by simplifying the choices available to them. They usually use the subset of all the information available & try discarding the best possible alternatives in order to choose from a small number. Decision-makers are content to accept the solution which can be considered "good enough" instead of finding the optimal solution. In doing so, they might make some biases unintentionally, which have a role to play during the entire investment process.

These biases include:

Denial: Many of the times, it is difficult for investors to believe that, the stock they have been holding since ages has now become under-performing & can be sold off. Constantly, there's a state of denial. Even if, the asset brings the overall portfolio returns down, investors are still reluctant in order to part with such ill-performing asset.

Emotions: Many behavioral anomalies stem from the extreme emotions of investors. This happens in situations where investors respond to their biases and don't make logical decisions. Past experiences, misconceptions, risk-aversion & misinterpretations can all combine to hinder the logical side of investor's mind & exposes their decisions to probabilities of losses and risks.

Loss Aversion: The risk-taking ability varies among investors. Some are welcoming towards certain degree of risks while some are very conservative. Among the conservative ones there are investors who fear the losses like anything. Such investors might be aware of potential gains but are much more intimidated by prospects of small losses of incur. Put differently, their aversion for losses is much higher than their excitement for gains.

Information processing errors: One of the biases in investor psychology & often known as the Heuristic simplification. Such people try to simplify their approach to solve problems instead of depending on logical reasoning. Such an approach which tends to omit crucial information in order to reduce complexity, is detrimental to investment decisions & can lead to inappropriate and flawed decisions.

Framing: As per the Modern Portfolio Theory, investment is not subjected to isolated evaluation. But, it should be reviewed in light of entire portfolio. Investors should possess a wider vision while managing their wealth instead of focusing on single asset. However, there are set of investors who individualize their assets out or a specific investment for evaluation. Such practice means "narrowing down of frame" while viewing things. It may lead to losses hence, investors need to view the holistic picture while evaluating with a "wider frame".

Anchoring: Many a time investors aren't welcoming towards new set of information. They "anchor" a particular belief and refuse to leave them. This makes difficult for investors to accept new information regarding the subject. For example; the situations when banks are involved in scams, then the negative information already in the economy has already received much greater intensity such that other set of positive information is not able to neutralize the impact of it.

Social influence/ herd mentality: Herding is not so popular phenomenon of stock markets. Such investors don't research while forming investment decisions & only follow the crowd sentiments. The Tech-bubble of early 90's, the 2008 subprime crises, the 2010 Eurozone crisis, even the scams in Indian banking sectors, these all examples have led to huge sell-offs. All such massive sell offs and rallies are the results of herding.

By understanding these biases, the professionals in the field of investment and finance can actually improve the economic outcomes. Hence, behavioral finance tries to incorporate investors' irrationalities while analyzing for their impact on the stock markets. Behavioral

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finance has its own impression in the stock market and in future as well this area will have its implications and will be required for many studies. There had been various approaches to include investor sentiments in the research models and behavioral finance's theories.

1. The first method incorporates "survey-based" approach which includes seeking and analyzing investors' views on stock markets. Later, resulting into a measure of investor's sentiment on the basis of mood investors possess.
2. The second method is the one where researchers try to analyze market sentiments by extracting information on investor's mood through social media platforms, blogs, new articles and various form of relevant theoretical information.
3. Third approach is to analyze the internet search behavior of people. Usually, people start their decision-making processes on the basis of their researches. Internet services do avail the publicly search data and many authors have tried to utilize that data in their own researches to study investor sentiments.
4. Fourth approach studies the impact of non-economic factors affecting the investor sentiments. Reasons for individual's irrational behavior can be related to weather conditions, health, rain etc. Some of the authors have even worked on the dependence between stock returns & lunar phases.
5. The fifth approach, empirical approach often known as financial markets-based approach, is the widely used approach and is going to be used in this research work too. In this approach researchers, try to construct the investor sentiment index with the help of various ratios available in the financial markets as a proxy & then analyzing the impact of sentiments on stock markets.

Researchers have focused on various developed and developing nations' stock markets in order to measure the impact of investors' emotions, beliefs & sentiments in one way or the other. There are papers which have also, paid attention to retail equity investors, different approaches & techniques are being adopted just to know & analyze the factors which actually have played a significant role in influencing the stock markets.

Brown & Cliff (2004) analyzed that investor sentiments are related to past stock returns significantly. They used principal component methodology in order to define their sentiment index. Most importantly, their work showed that the investors' sentiments possess little forecasting power for near-future returns in the stock markets. The proxies thus used to measure sentiments include advance & declining ratio, margin borrowings, put-call ratio, high and low ratio, short sales, short interest, odd lot sales to purchase, monthly forecasts of commodity market returns, NIPO, first day IPOs etc.

M. Baker & J. Wurgler (2007) used "top down" approach to measure the effect of aggregate investor sentiments & its impacts on the stock market returns. The paper revolves around the two main assumptions, namely; investor sentiments & limits to the arbitrage. The paper tries to prove that investors are very sensitive towards the stocks of startup firms or those with less capitalization, firms in financial distress, growth companies etc. In other words, stocks which are difficult to value or are difficult to arbitrage are more affected by the investors' sentiment. The proxies thus, used in their work to measure the sentiments include; number of IPO, turnover ratios, closed-end fund discounts, IPOs first day returns, dividend premiums & equity-debt ratios.

The study by Baker & Wurgler has been of great influence in various researches & analysis following which the investor sentiment index thus formed and further studies build various models and relate stock market elements like; stock returns, stock price volatility, trade volumes with investor sentiments by taking suitable proxies for optimism, pessimism, overconfidence etc.

Dhaoui (2015) attempted to explain the impact of rational expectations along with behavioral biases on the variability in trading. The analysis was conducted for five developed

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nations' capital markets US, Japan, U.K, France and Switzerland. Dhaoui analyzed that when it comes to investment decisions then rationality principle fails as investors' sentiments are the main drivers of decision-making process and further his findings suggest that all the macroeconomic models must incorporate in some way or the other investors' belief, sentiments & emotions to have better predictions about how things will work. The proxies used in the paper are inspired from the work of Dhaoui (2013), which tried to form sentiment index to capture the sensitivity of trading volume to behavioral factors. The author also presented trading volume as a function of rational expectations, optimism, pessimism & overconfidence. Proxy thus used for rational expectations is Market Trend. For optimism & pessimism, he used the direct approach, which clearly states, if the price of an individual stock is higher (lower) than average market stock price then the investor can be optimist (pessimist) about the stock. Index used to check for variability between individual stock prices and the average stock prices was CAC40 Stock Index. In case of overconfidence, the author presented trading volume as a function of historical returns i.e. Current period's trading volume (TVt) should be a function of previous period's returns (Rt-1). But it was difficult to incorporate other the variables in the model because of difficulty in analyzing them altogether. Therefore, Dhaoui used fuzzy logic in his methodology to represent the impact of behavioral factors along with rational expectations on trading volume.

Likewise, following the same framework, different researchers have targeted different economies. Some of the research works are Investors' sentiment and the stock market behavior: An empirical analysis of the Saudi stock market by Basmah Maziad Altuwaijri (2016). In his research his objective was focused on two things: First, he tried to measure the degree of impact caused by investors' sentiments for which an exclusive index was constructed using Principal Component analysis. Plus, a number of proxies were utilized like; trading volume, stock market volatility, stock returns, considering some controlling variables too, such as book-to-market & liquidity ratios. Second focus of the work was to study relationship between the mispricing in Saudi's stock market & the investors' beliefs.

Till now, the discussion has been more inclined towards the approaches and methodologies adapted in developed nations. For Indian context, no unique or specific investor sentiment index is formed to capture the impact of sentiments on stock market variables. Sehgal (2009) tried establishing the relationship between sentiments of investors and the performance of markets. Most of the respondents to their study believed that sentiments and market returns go hand-in-hand. The findings of this paper prove to be helpful in order to develop a sentiment index. Hence, the paper did pay attention to the importance of investor sentiments for understanding the patterns of Indian Stock Markets. Various studies have tried focusing on different aspects to gauge and measure the influence of investor sentiments on the Indian Stock Markets. Some of the works done in India to have a better picture of how sentiments can affect the stock markets are as follows:

Saumya Dash & Jitendra Mahakud (2012), attempted to examine the causal relationship aggregate stock market indices like; NSE Nifty and BSE Sensex and the sentiment index thus constructed using implicit proxies from the market. 12 different proxies had been put to use in order to study the causality between the two. Proxies include, ADR, dividend premium, fund flows, NIPOs, put-call ratio, Price to earnings high-low difference etc. The study concluded that investor sentiment is more of a short-run phenomenon and in long-run investment decisions, the risky effect of sentiments can be mitigated. Jaya M. Prosad (2014), conducted primary as well as secondary analysis to detect the presence and impact of biases like, herding, home bias,

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representativeness and overconfidence. For secondary analysis, proxies thus used include: Daily total returns, daily transaction volumes, daily high and low & daily closing prices. Pramod K. Naik & Puja Padhi (2016) tried exploring relationship between stock return volatility and the investor sentiments using NSE monthly data from July'2001 till Dec'2013. Sentiment index was constructed with help of PC analysis using 7 market indicators namely; Advance Declining ratios, NIPO, put-call ratio, PE ratio, Mutual fund net flow, turnover rates and trading volumes. The findings revealed that both positive & negative sentiments asymmetrically impact the excess return volatility. They too checked for causality between the sentiments & excess returns. The causality turned out to be bi-directional as per the Granger causality test. Divya Aggarwal (2017) studied the relationship between stock markets & investor sentiments, by using a fresh & different approach. In her research, she tried to capture the optimism and pessimism of investors, by making use of VIX (Volatility Index) & MMI (Market Mood Index). Her study revealed that, investor sentiments are significantly related with stock market returns statistically. Also, Changes in MMI have lower explanatory power in order to explain the changes in contemporaneous stock returns as compared to changes in VIX. However, a long-run relation has been established between MMI & stock returns.

Likewise, there are many other studies being done in India to capture influence of sentiments on stock markets. One of the reasons for considering empirical analysis in the study is that, Indian capital markets are highly being dominated by the investments from abroad, especially in the form of FIIs. Hence, other approaches used in forming sentiment index can't be relied upon especially, when it comes to survey-based approaches, the information collected is highly likely to be skewed towards the preferences to Indian equity investors. Hence, this study will use empirical approach for the study of impact of investor sentiments on stock market returns. In view of previous literature, the investor sentiments had been affecting the stock market elements in various ways and number of measures had been used in forming sentiment indices to study the impact of sentiments on markets and its elements. The main aim of this paper is studying the impact of sentiments on stock market returns by incorporating various market implicit proxies while forming the sentiment index. This analysis might be helpful in extending literature for developing and emerging economies like India.

Potential Proxies for the Study of Investor Sentiments

There are no rules of thumb when it comes to finding potential proxies for gauging sentiments or for formation of investor sentiment index. This is mainly because, the sentiments are unobservable and each group of interested individuals has their own way of forming sentiment indices and capturing the impact of sentiments. Many researchers tried forming their investor sentiment indices through direct surveys by collecting data from institutional investors as well as from individuals, just to know about their anticipations for the stock market movements. However, the data collected might have limitations too, which might make the analysis skewed or there might be some errors in data collection techniques, unscalability, problem in data processing, no or limited scope for generalization etc.

Recent studies, in order to avoid limitations of direct surveys, use market related proxies in order to form sentiment indices. Advantages of using market related proxies are: data can be extracted from reliable resources, can be generalized, such proxies represent the mood of the economy. However, the number of proxies, used in construction of sentiment index is not definite. Different research works, use different proxies depending on their studies Table 1.

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Table 1 LIST OF SENTIMENT PROXIES USED IN DIFFERENT STUDIES	
Studies	**Market related proxies used**
Brown & Cliff (2004)	Advance & declining ratio, margin borrowings, put-call ratio, high and low ratio, short sales, short interest, odd lot sales to purchase, monthly forecasts of commodity market returns, NIPO, first day IPOs etc.
Baker & Wurgler (2006, 2007)	Number of IPO, turnover ratios, closed-end fund discounts, IPOs first day returns, dividend premiums & equity-debt ratios.
Kumar & Lee (2006)	Buy – sell imbalance ratio
Dash & Mahakud (2012)	ADR, dividend premium, fund flows, Number of IPOs, put-call ratio, Price to earnings high-low difference, share turnover velocity, turnover volatility ratio, buy-sell imbalance ratio, cash to total assets in mutual funds market, equity issue to total issue, change in margin borrowings.
Dhaoui (2013)	Market trend = (Closing Price-Lowest Price)/(Highest Price – Lowest price) as a proxy for rational expectations, Past returns, average stock prices.
Huang, Yang, Yang & Sheng (2014)	Turnover rates, Number of IPOs, first day return on IPOs, equity issues in new issues, close-end fund discount
Jaya Mamta Prosad (2014)	Daily total returns index, daily high & low, daily closing prices, daily transaction volumes.
Naik & Padhi (2016)	Advance Declining ratios, NIPO, put-call ratio, PE ratio, Mutual fund net flow, turnover rates and trading volumes
Basmah Maziad Altuwaijri (2016)	Trading volume, stock market volatility, stock returns, considering some controlling variables too, such as book-to-market & liquidity ratios
Divya Aggarwal (2017)	India VIX , Market mood index (MMI)
Ahmed Bouteska (2019)	P/E ratio, Bull/Bear ratio, trading volume, liquidity ratio, market turnover, IPO returns, Number of IPO (IPO activity), investor satisfaction ratio

Price-to-earnings (P/E) ratio: This ratio reflects the price of the stock in the market along with the situation of the listed companies financially. The ratio is often related positively to the market sentiments. Hence, higher P/E ratio implies higher market sentiments too.

Number of IPOs (NIPO): It has been argued that, the demand for IPOs is highly correlated to market sentiments. It is often observed that, the demand for initial public offerings is sensitive towards the market conditions. Hence, it can be a good proxy for sentiment index construction.

Trading Volumes & Turnover rates: Both of these indicators reflect the liquidity situation in the market. The market with high liquidity, some group of investors become in irresistible and they do more trading in order to keep trading volume high which leads to increase in turnover rates too.

Advance-to-Decline ratios (ADR): The ratio represents the number of advances in the market to the number of declines. This ratio helps to analyze the market trends. Lower value of ADR means declining trend in the stock market while, higher value represents the upward/advancing trend in the market.

Put-Call Ratio (PCR): This ratio helps to analyze the trends in derivative markets. This ratio represents the ratio of volume of put options to call options. Higher PCR implies market is bearish while lower PCR implies market is bullish.

Volatility Index (VIX): It is the indicator of mood in the markets, especially in short-term. It has been argued that, when VIX is high i.e, market being more volatile then there is high

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probability of market being bearish in near term & vice-versa. Example- Over the years, the correlation between NSE's benchmark index Nifty 50 & India VIX has been negative, which is quite normal too. Hence, VIX can be a good proxy for quantification of market sentiments.

Mutual Fund Net Inflow (MFNI): Investors consider mutual funds as an opportunity to invest. Mutual funds act as a built-in diversification for investors hence, are less risky than other assets. Also, these are easy to buy and sell. Large inflow of mutual funds in the market represents the preference of investors towards this class of assets. Hence, large inflows represent the faith of in mutual fund markets.

Dividend premium: The dividend premium is defined as the difference between the average market-to-book value ratios of dividend payers and non-payers. As per Baker & Wurgler, such premiums are paid by the larger, more profitable and well-established companies which have low growth opportunities. Therefore, rise in dividend premium makes investors more cautious about the firm & generally represent negative investor sentiments.

Market Mood Index (MMI): MMI is a real-time indicator of investor sentiments that explains the current mood in the market. The index has been constructed by normalizing the components on the scale of 0-100, giving equal weights to them. Indicator value above 50 indicates greed in the market while value of index being below 50 indicates fear in the market.

Bull/Bear Ratio: The Bull/Bear ratio is a stock market or an economic indicator that helps analyzing or tracking market sentiment by means of surveying professional financial advisors. If the Bull/Bear ratio is less than 1 then there are higher bearish sentiments in the market as a greater number of advisors expect market to fall; and bullish market expectations are there when the ratio is greater than 1. Likewise, there can be other proxies too, which could help in quantifying the unobservable impact of investors' sentiments on the stock market. But the availability of data and various other factors narrow down the list.

CONCLUSION

The literature substantiates that several studies attempts to gauge the sentiments prevailing the market. The proxies do have certain amount of impact on the stock market variables, which is significant. Afterwards, Granger Causality test has been used to check whether the proxies selected can be used to forecast the stock market variables or not. The results for some proxies suggest that stock market variables Granger Cause the sentiment component in the proxies used, which is actually true because, investors do look into stock market variables and various other proxies and on the basis of that, they form their respective assumptions about the market. While, considering the Granger Causality tests for PER & ΔPER, then the sentiment component present in this proxy does impact the stock market variables because, every investor has his/her own judgment about the PER & while considering PER, investors do get biased and their expectations may vary. Sentiment Index explains that Sentiment Index does have a significant impact on the stock market variables as well as there is bi-directional causality among the stock market variables and the sentiment index, which explains that both are variables are capable of forecasting the other one. In India, there is no composite/defined sentiment index, therefore the number of proxies used for construction of such indices are not definite. that, stock markets are driven by behavioral biases, investor judgments, expectations present in the market.

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