CHAPTER 8

SUMMARY, FINDINGS, CONCLUSION

AND SUGGESTIONS

This concluding chapter summarizes the whole study. The main findings of the study are also reported in this chapter. It highlights the conclusion and discusses the limitations of the present study. Further, some suggestions to investors, portfolio managers, academicians and policy makers have also been given in this chapter. Finally, the directions for some future research have put forth in it. Basically this chapter presents the overall viewpoint i.e. the concluding remarks of the study.

8.1. Introduction

The traditional finance theories “(Capital Asset Pricing Model (CAPM), Markowitz management Portfolio Theory, Arbitrage Pricing Theory, Fundamental Analysis, Technical analysis, Efficient Market Hypothesis)” assumed investors are rational and evaluate investments based on trade-off between risk and reward. The traditional finance framework ignores that investors make systematic errors in the way they think and create distortions in the process. The underlying assumption of investor rationality is a flawed one and that alone has led to the capital markets across the globe witnessing major booms and busts. Behavior finance is a paradigm that has emerged in response to investor irrationality. The present study examines one such concept of behavior finance on investor herding in Indian stock market. Herding is characterized by mimicking the actions of other investors, which constitute the market consensus (Bikhchandani and Sharma, 2001). It prevails in the market because investors are concerned with what others think of their decisions (Scharfstein and Stein, 1990). It is an investment practice where investors imitate the actions of others and follow the "group" rather than their own information and take investment actions that are not incongruence with their information. Herding can be spurious when its outcome is efficient, i.e. when all investors take the same action because of the same information present with them. On the other hand, it can be intentional where an investor just follows the group without any thought to his information which may tell him to act otherwise (Banerjee, 1992). According to Devenow and Welch (1996)
“herding requires coordination in order to follow some signal or to observe the action of others”. Avery and Zemsky (1998) define “herding as the behavior which occurs when agents imitate the prior actions (buying or selling) of others”. Hirshleifer and Teoh (2003) also define herding “as any behavior similarity or dissimilarity brought about by the direct or indirect interaction of individuals”. There are various reasons why herding prevails with the most obvious one being the pressure of social conformity (West, 1988). Also the group knows something that an individual might be missing. “Herding in stock market make the prices move away from their fundamental value besides increasing volatility in their returns (Tan et al., 2010)”. It further has the tendency to weaken the financial markets which may make the entire financial system look fragile.

“As Indian stock markets have been long criticized as an inefficient and riskier due to the less educated investors, cultural differences, incomplete share market laws and their weak enforcement, poor reporting system of accounts and low level of information disclosure” (Akbar and Samii, 2004; Khanna and Palepu, 2000; Li, 2008; Zhang and Zhao, 2004). “These failures amounted to existence of herding and other market anomalies in emerging markets “(Chang et al., 2000; Demirer and Kutan, 2006).

There are few studies “(Jose, Varghese and Surendran (2018), Satish and K (2018), Banerjee and Padhan (2017), Kumar and Bharti (2017), Ganesh and Naresh (2016), Saxena (2015), Garg and Jindal (2014), Bhatt (2013), Prosad et al. (2012), Bhaduri and Mahapatra (2012), Lao and Singh (2011)” investigated the presence of herding in respect of the stock markets of emerging economies such as India as most of the studies pertain to developed markets. These studies didn’t determine herding for such a large sample and time period. Some studies determined herding on Nifty50, some for particular sector and so on. But, the present study tried to determine herding in Indian stock market by analyzing NSE 500 companies for the period of sixteen years i.e.1999-2014. The study also examined the impact of trading volume, firm size and industry group on herding. The data related to daily and monthly closing prices of NSE 500 companies have been taken from the PROWESS database. The values of daily and monthly closing index have been taken from the website of www.nseindia.com. The companies which were regularly traded for the whole study period were selected for the sample. Therefore, out of 500 companies only 270
companies were selected as the sample for study. Various hypotheses have been framed to achieve the objectives of the study. Two methodologies like “Christie and Huang, 1995 and Chang, Cheng and Khoranna, 2000” have been used to determine herding and non-linear pattern of herding in Indian stock market in varying market conditions (bull/bear) and time periods (pre-crisis, during crisis and after crisis).

The present chapter has been divided into six sections. In Section 8.2, summaries of all the chapters included in the study have been given. Section 8.3 provides the main findings of the study as per different objectives with the acceptance and rejection of related hypotheses. Section 8.4 gives the concluding remarks of the study. The limitations has been given in section 8.5. The section 8.6 provides the suggestions and implications of the study to investors, portfolio managers, academicians and policy makers. At the end, section 8.7 provides the scope for further research in the future. Section 8.8 provides the summary of the chapter.

8.2. Chapter Summary

While introducing the theoretical background of the study, Chapter One also discusses the issues of the investors i.e. need and types of investment, traditional and modern approach of investors, efficient market hypotheses, emergence of behavioral finance, meaning and types of herding, theories related to herding, need of the present study and objectives to carry out the research. It concludes with the organization of the study.

Since liberalisation, privatization and globalization of Indian economy, there has been tremendous change seen in the Indian stock market. Chapter Two provides the detailed analysis of the development of Indian stock market for the study period. Descriptive analysis of the yearly performance of Indian stock market have been empirically analysed using the daily closing prices of the NSE 500 Index. The regulatory framework concerning investors’ protection in India has also been discussed in this chapter.

Chapter Three provides the review of literature for the different objectives of the study. The chapter reviews the studies concerned to investigate existence of herding in securities markets of various developed and emerging economies. The studies related with investigating herding on the basis of trading volume, firm size and
industry type has also been reviewed in different sections. The review of literature has also been provided in the global as well as in Indian context separately. At the last part of this chapter, summary of studies has been provided in the tabular format.

**Chapter Four** explains the research methods used to examine herding in Indian stock market in different market situations and time periods and also find out the impact of turnover rate, size and industry group on the herding. The population and sample selection criteria for all the objectives of the study have been discussed. Further, the sources from where the data has been retreived, time period for which the study has been conducted and the framework of analysis has been discussed. Inclusive information about the dependent and independent variables of the study has been explained. The results of unit root tests, autocorrelation and heteroskedasticity of the error terms has also been reported in the chapter. It provides a quick look on the research methodology used to attain the objectives of the study. It also shows the tools and techniques adopted to fulfill the stated objectives.

**Chapter Five** presents the empirical analysis of the companies listed on Nifty500 index for the period of sixteen years i.e. 1999-2014 using the “Christie and Huang, 1995 model”. The non-linear relationship between market return and securities returns has also been analysed using the methodology of “CCK, 2000” in the present chapter. The third part of the chapter examines the herding in extreme market conditions like bullish and bearish market respectively. The next part of the chapter analyse the herding in pre-crisis (1999-2007), during crisis (2008-09) and after crisis periods (2010-2014).

**Chapter Six** reports the analysis of the impact of turnover rate and firm size on herding in the Indian stock market. The first section has provided with complete analysis of the high and low volume companies as per “CH (1995) and CCK (2000) models”. The non-linear relationships of high and low volume companies stock return dispersions and market return have also been analysed. The second part of the chapter provides the complete results of “large-cap, mid-cap and small-cap companies”. The sub-section one of part two of this chapter provides the analysis of herding in the period of market stress as a whole for the study period related to “large-cap,mid-cap and small-cap stocks” separately. The non-linear relationship, herding in extreme bullish and bearish market, pre-crisis, during crisis and after crisis periods have also been reported for different types of the companies as per their size.
Chapter Seven provides the complete analysis of herding in manufacturing and non-manufacturing sectors of the Indian stock market for different market periods and conditions using the “CH (1995) and CCK (2000)” models. The non-linear relationship between stock returns of manufacturing, non-manufacturing companies with market return during the whole period of study and during bull and bear phases have also been measured. The herding has also been determined during extreme up and extreme down market conditions and also in pre-crisis (1999-2007), during crisis (2008-2009) and after crisis periods (2010-2014) for both manufacturing and non-manufacturing companies.

Chapter Eight i.e. the present chapter comprehends the summary of all the chapters included in the study. The main findings as per different objectives of the study are also reported in this chapter. It highlights the conclusion and discusses the limitations of the present study. Further, some suggestions to investors, portfolio managers, academicians and policy makers have also been given in this chapter. Finally, the directions for some future research have put forth in it. Basically this chapter presents the overall view point i.e. the concluding remarks of the study.

8.3. Empirical findings of the study

The results of the present study have been bifurcated into four sections. Section 8.3.1 provides the results related with the complete and year wise analysis of Indian stock market for the period of sixteen years from 1999-2014. Section 8.3.2 presents the results of the herding in the Indian stock market in different market periods (pre-crisis, during crisis and after crisis) and conditions (bull/bear) for the study period i.e. 1999-2014. Section 8.3.2 provides the findings related to trading volume and herding. Section 8.3.3 and 8.3.4 present the results of impact of firm size and industry type on herding respectively.

8.3.1. Analysis of Indian stock market since 1999

Since the commencement of economic reforms in 1991, there have been considerable changes in the regulatory, structural, institutional and operational system of the securities market of a country. These changes helped in improving efficiency, promoting transparency, preventing unfair trade practices and promoting the standard of Indian stock market up to the International standards.
• NSE as of 2017 has gained the twelfth position in the world in terms of market capitalization.

• The Sensex, which has 5000 points in 1990s, raised to 20000 in 2008 and in 2017 it has reached to 34000 points.

• As per World Federation of Exchanges (WFE) measurements, NSE has been among top exchanges in terms of number of shares traded and total number of trades in equity shares in 2017.

• NSE performance in terms of total number of trades has been continuously increasing from 2014 to 2017.

• The average daily return of the NSE 500 index for the study period (1999-2014) is positive (0.073%) with a maximum of 16.23% and minimum of -12.09%.

• Investors in the short term earn the positive capital returns on their investment in the Indian stock market with high volatility i.e. with standard deviation of 1.60%.

• The study has analysed the characteristics of daily returns of the Nifty 500 index on yearly basis:

1. In year 1999, the average daily return of NSE 500 index was 0.28% having an increase of 41.5% at the end of the year. High returns in stock markets were combined with high volatility of 1.83% over the same year. The prices are really shoot up from 613.5 points to 1205 point in this year as FIIs and mutual funds have invested in the Indian stock market at a very large pace in this year.

2. The returns were negative (-0.08%) with high volatility (2.31%) due to various reasons such as Gujarat earthquake, diminishing the rupee value, increasing the dividend distribution tax from 10% to 20%, more interest rate and high inflation rates. The biggest scam in the history of Indian stock market happened in the year 2000 i.e. the Ketan Parek scam. The GDP rate was also declined from 6.4% to 6%.
3. The return (-0.09%) has also come negative in this year. With the introduction of rolling settlement system, trading in Index options, trading in options on individual securities and trading in future on individual securities in 2001 has attracted the FIIs and retail investors in the Indian stock market.

4. The returns were positive but it was very less i.e. 0.05%. There was a fall in prices by -21.06% from the last year. NSE has launched the Exchange Traded Funds (ETFs) in January.

5. The daily return was 0.28% as compared to the previous year (0.04%). The prices were doubled from the starting 689.20 to 1531.35 at the end of the year. There was 89.79% growth shown in the prices from the last year. It was the highest among all the years of the study.

6. There were many macroeconomic changes occurred like revival of new industries, lift up the investment level, enhancement in exports and imports policies etc. has made the Indian stock market more attractive to investors from all over the world.

7. This year also showed the positive returns (0.12%) on the daily basis to the investors in the national stock exchange having the volatility of (1.05%). The returns was also positive (0.13%) with high volatility of (1.62%).

8. History was created in the year 2007 with drastic changes in the prices from 3000 to 5000 points. The stock market in India has greatly affected by financial crisis and created the higher volatility (1.51%).

9. The returns were negative (-0.30%) with the highest level of volatility of (2.72%) showed the insecurity of investors in stock markets.

10. Due to the initiatives taken by RBI in 2008, the positive returns (0.28%) with high volatility (2.05%). The GDP rose from 6.7 % to 7.9% in 2009. This year also brings positive returns (0.5%) with standard deviation of (0.96%). The prices have increased at 20.07% on yearly basis. After the financial crisis, GDP of India grew at 8.5% making the Indian economy is one of the best economy among all the emerging economies.
11. With the increase in oil prices, FIIs outflow from the market, lesser growth in the trading sectors has again restricts the growth of Indian stock market. This year negative returns have been found (-0.12%). The prices have shown the negative trend of (-4.04%) on yearly basis.

12. Many investors came to the Indian stock market in this year as the Euro-zone crisis has affected almost all the developed economies. This has turned the negative returns of the previous year in to positive returns (0.11%). The volatility has also went down (0.93%) in this year.

13. The returns were positive (0.02%) with more volatility (1.02%) as compared to the previous year.

14. The year 2014 has reached to its maximum heights after the global financial crisis. It has broken all the previous records as it reached to 7000 points now. The return came positive (1.14%) with less volatility (0.84%) as compared to the previous year. The prices showed 41.63% growth on yearly basis. The market capitalization of NSE showed 36.4% growth in the year 2014. Thus, it can be said that the year 2014 has made history in the Indian stock market by reached at the maximum level i.e. 7000 points.

8.3.2. Herding in different market conditions (bull/bear) and periods (pre-crisis, during crisis and after crisis)

The present study has analyzed herding in the Indian stock market for different time periods (pre-crisis, during crisis and after crisis) and conditions (bull/bear) for a sample of 270 companies listed on the NSE 500 index for a period of sixteen years i.e. from 1999-2014. To analyse the herding in the stock market of India, two return dispersion models like “Christie and Huang, 1995 and Chang, Cheng and Khoranna, 2000” have been used. “CH (1995) used the cross-sectional standard deviation (CSSD) measure and CCK (2000) used the cross-sectional absolute deviation (CSAD) measure”. By using the software EVIEWS 8.0 regression equation given by “CH (1995)” for the daily and monthly datasets has been run to find out the relationship between equity return dispersion and extreme market movements. Extreme market movements have been decided at three criterions i.e. at 66%, 95%
and 99%. The non-linear relationship between the market return and individual securities return has been measured with CSAD method given by “CCK (2000)” model. Acc. to them, “if herding is there in the stock market there will be negative relationship between market return and individual stock return”. To analyse the herding in different market conditions like bull and bear market, the data has been divided into two markets i.e. bull/up market and bear/down market. “When the market return ($R_{m,t}> 0$), there is up market and when ($R_{m,t}< 0$) there is down market (CCK, 2000)”. “Financial crisis also has an impact on herding behavior in the stock markets (Chari and Kehoe, 2004)”. So, the present study has the following objectives:

1. To determine herding in the Indian stock market in different market periods and conditions.

2. To determine herding in the period of market stress as a whole i.e. 1999-2014.

3. To find out the non-linear relationship between market return and individual stock return for the period of study.

4. To find out herding in both bull and bear market conditions for the study period.


The empirical findings of these above stated objectives are as under:

1. Herding is not found in the period of market stress as a whole i.e. 1999-2014 by using the “CH (1995)”model.
   - The values of coefficients of $\beta_1$ (0.16, 0.42, 1.19) and $\beta_2$ (0.38, 1.12, 1.89) come out positive and significant respectively based on daily data.
   - The values of $\beta_1$ coefficients are 0.27, 0.46 and 0.17 and $\beta_2$ are 0.50, 2.86, and 2.54 respectively for the monthly data.

This shows that herding has not been detected in the short run as well as long run as both the daily and monthly datasets produced the positive and significant coefficient results (Prosad et al., 2012; Garg and Jindal, 2014; Saxena, 2015). Therefore, the hypothesis ($H_{1a}$: There is significant presence of herding in the period of market stress as a whole in the Indian Stock Market) stand rejected.
2. Non-linear relationship and herding has not been found even in CSAD model. There is a linear and positive relationship found between market return and individual stock return. The value of the square term of market return $\beta_2 (0.01)$ is positive and statistically significant at 10% level of significance only using daily data and the value of $\beta_2 (0.12)$ is also positive and significant at all levels of significance using monthly data shows the rejection of hypothesis ($H_{1b}$: There is significant non-linear pattern of herding in the Indian stock Market Indian Stock market) is rejected.

Therefore, the investors in Indian stock market made proper use of the traditional finance theories “(Capital Asset Pricing Model (CAPM), Markowitz management Portfolio Theory, Arbitrage Pricing Theory, Fundamental Analysis, Technical analysis, Efficient Market Hypothesis)”. They used their own personal information about the market and not merely mimic the actions of others. So, Indian investors are considered to be rational. This may be possible due to the stringent rules and regulations made by SEBI.

3. The herding is also absent in bullish and bearish market conditions.

- The coefficients of square terms of daily (0.01) and monthly (0.16) market returns ($R^2_{m,t}^{UP}$) for the up market are found to be positive and statistically significant at all levels of significance, which establishes absence of herding in rising market situations.

- Similarly, the positive and statistically significant coefficients at 5% level of significance and positive of the square terms of the daily (0.01) and insignificant but positive of monthly (0.04) market returns ($R^2_{m,t}^{DOWN}$) for the down market presents the absence of herding in the bullish market situation and rejection of hypothesis ($H_{1c}$: There is significant presence of herding in bullish market condition and bearish market condition in the Indian Stock market)

Investors are well educated and rational that they don’t seem to be creating panic and chaos during the extreme price movements. Rather they took rational and profitable decisions.

4. To examine the global financial crisis impact, pre-crisis period (1999-2007), during crisis (2008-09) and after crisis period (2010-14) have been analysed using the “CH (1995) model” and found no evidence of herding in either of the time periods.
• It has been found that the coefficients of $\beta_1$ (0.17, 0.28, 0.66) and $\beta_2$ (0.44, 1.24, 1.41) are positive and significant at all levels of significance in all three criterias, signify absence of herding in Indian stock market before financial crisis period.

• The values of the coefficients $\beta_1$ (0.60, 1.66, 2.66) and $\beta_2$ (1.10, 3.26, 3.25) are positive and statistically significant at all levels of significance during the crisis period.

• After the crisis period also the values of $\beta_2$ coefficient (0.29, 0.54, and 1.62) are positive and significant at all levels of significance for all the three criteria respectively. Hence, hypothesis ($H1_d$: There is significant presence of herding in pre-crisis, during crisis and after crisis periods in the Indian Stock market) is rejected.

The summary of hypotheses and results for the first objective:

Table 8.1: Summary of Hypotheses and Results for analyzing herding in the Indian stock market in different market conditions and time periods

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Impact</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>$H1$: There is significant presence of herding behavior in Indian stock market.</td>
<td>Positive and Significant</td>
<td>Rejected</td>
</tr>
<tr>
<td>$H1_a$: There is significant presence of herding in the period of market stress as a whole in the Indian Stock Market.</td>
<td>Positive and Significant</td>
<td>Rejected</td>
</tr>
<tr>
<td>$H1_b$: There is significant non-linear pattern of herding in the Indian stock Market.</td>
<td>Positive and Significant</td>
<td>Rejected</td>
</tr>
<tr>
<td>$H1_c$: There is significant presence of herding in bullish market condition and bearish market condition in the Indian Stock market.</td>
<td>Bullish market = Positive and Significant.</td>
<td>Rejected</td>
</tr>
<tr>
<td>Bearish Market = Positive and Insignificant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$H1_d$: There is significant presence of herding in pre-crisis, during crisis and after crisis periods in the Indian Stock market.</td>
<td>Before and During Crisis = Positive and Significant After Crisis = Positive and Insignificant</td>
<td>Rejected</td>
</tr>
</tbody>
</table>

Source: Researcher’s Own Compilation’
8.3.3. Trading volume and herding

The study also aims to determine the impact of turnover rate on herding in Indian stock market. For this, sample companies have been divided into high and low turnover companies on the basis of median turnover rate of the sample companies for study period. Companies having more turnover rate than the median turnover rate of a particular year have been considered as high turnover company (HTC) for that year and company having turnover rate less than the median turnover rate has been termed as low turnover company (LTC). In this way, for all the sixteen years HTC and LTC has been chosen and calculated high turnover standard deviation (HTSD), high turnover absolute deviation (HTAD), low turnover standard deviation (LTSD) and low turnover absolute deviation (LTAD) on the basis of “Lin and Fu (2010) model”. Using the models of “CH (1995) and CCK (2000)” separate regression equations have been run for the high turnover companies and low turnover companies respectively. The findings are as follows:

1. The mean average return of the HTSD is 3.36 and LTSD is 2.60 with the maximum and minimum of 5.13, 1.89 and 7.83, 1.21 respectively and standard deviation is more in the low volume companies (1.63) as compared to high turnover companies (1.13). “This shows the fact that low volume companies have the tendency to move away from the market return and herding is more likely to be detected in it (Lin and Fu, 2010)”.

2. Herding is neither found in high nor in low volume companies as per “Christie and Huang, 1995 model” for the whole time period i.e. 1999-2014.

- The positive and insignificant coefficients of $\beta_1 (0.92, 0.37, 0.37)$ and positive and statistically significant at 10% level of significance of $\beta_2 (2.07, 1.94, 1.94)$ across all the three criteria based on annual data of high turnover firms show that the equity returns dispersion in reality incline towards higher side as opposed to diminish amid extreme market movements.

- The values of $\beta_1$ coefficient (1.70, 2.34, and 0.48) are not statistically significant in all the three criteria but positive. The values of $\beta_2$ (0.97, 0.94 and 0.61) are also not statistically significant but positive in 66%, 95% and 99%, rejected the hypothesis $H_2$: There is significant presence of herding in high turnover rate companies in the Indian stock market.
Therefore, the present study shows that there is no herding found in the **low turnover stocks** in Indian stock market for study period.

3. As per “CCK model, 2000”, non-linear relationship has been found in the high and low turnover companies as the coefficient of the market return has been negative for both types of companies. The value of $\beta_1$ (**-0.50 and -0.71**) comes negative for **high turnover firms** and (**-0.71**) **low turnover firms**.

4. Herding has not been found as per “CCK (2000) model” also in high and low turnover companies as the values of $\beta_2$ (**0.23 and 0.55**) is positive and statistically significant at all levels of significance indicates the **absence of herding in high and low turnover** companies and also rejection of hypothesis “($H2_a$: There is significant presence of herding in high turnover rate companies in the Indian stock market and also $H2_b$: There is significant presence of herding in low turnover rate companies in the Indian stock market)”.

The summary of hypotheses and results for the second objective:

**Table 8.2: Summary of Hypotheses and Results for analyzing the impact of turnover rate on herding**

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Impact</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>$H2_a$: There is significant presence of herding in high turnover rate companies in the Indian stock market.</strong></td>
<td>Positive and Significant</td>
<td>Rejected</td>
</tr>
<tr>
<td><strong>$H2_b$: There is significant presence of herding in low turnover rate companies in the Indian stock market.</strong></td>
<td>Positive and Significant</td>
<td>Rejected</td>
</tr>
<tr>
<td><strong>$H2_c$: There is significant presence of non linear relationship between stock return and market return in high and low turnover companies in the Indian stock market.</strong></td>
<td>Negative and Significant</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

*Source: Researcher’s Own Compilation*
8.3.4. **Firm Size and herding**

In the market economy, firms vary widely in sizes. Number of researchers has studied the relationship between firm size and herding. Few studies found small-cap stocks have more tendency to be herd. Others found herding in large-cap stocks. There are different views of herding as per the size of the companies in different stock markets. So, the present study aims to determine the herding in different categories of the companies as per their market capitalization. Companies having market capitalization more than 200bn have been considered as Large-cap companies (LC), companies having market capitalization between 50bn-200bn considered as Mid-cap companies (MC) and companies having market capitalization less than 50bn have been termed as Small-cap companies (SC) in the study. Large-cap companies represented as LC, Mid-cap companies as MC and Small-cap companies as SC in the study. Out of the total sample of 270 companies 64 are Large-Cap, 66 are Mid-Cap, and 140 are Small-Cap companies. The models of “CH (1995) and CCK (2000)” have been applied to find out herding in these three categories of companies. The findings of these models are as follows:

1. Small-cap companies have higher standard deviation of 1.37 as compared to mid-cap (0.97) and large-cap (0.97). It shows that small-cap has the tendency to move away from market return and herding is more likely to be detected in it.

2. As per “CH (1995) model”, herding has not been found in “large-cap, mid-cap and small-cap stocks” during the period of market stress as a whole for the whole study period. The results are as follows:

   - The values of coefficient $\beta_1$ *(0.31, 0.34, 0.59)* are positive and significant at 10% level of significance in 66% criteria but positive and insignificant for 95% and 99% criterion, indicated the absence of herding in large-cap companies during the bearish market condition. The positive and statistically significant at 10% level of significance of $\beta_2$ *(0.66, 0.76, 0.69)* across all the three criteria based on monthly data of large-caps firms show that the equity returns dispersion in reality, incline towards higher side as opposed to diminish amid extreme market movements.
• The values of $\beta_1 (0.38, 0.26, 0.23)$ coefficients are positive and insignificant in 95% and 99% criterion but significant at 10% level of significance in 66% criterion, indicated the fact that herding is not found in the extreme down market movements in case of mid-cap firms. During the bullish market conditions, the values of $\beta_2 (0.65, 1.49, 1.57)$ coefficients are positive and significant at all levels in 66% and 10% level of significance in 95% and at 5% level of significance in 99%, shows absence of herding in extreme up market conditions.

• The values of $\beta_1 (0.33, 0.05, 0.04)$ coefficients are not statistically significant in all the three criteria but positive, establishes absence of herding is small-cap companies in case of bearish market conditions. During the bullish market conditions, the values of $\beta_2 (0.46, 0.62, 0.02)$ coefficients are also positive but not statistically significant in all the three criteria; signifies absence of herding in the bullish market conditions.

Hence, the hypothesis ($H3_a$: There is a significant relationship between the firm size and herding in the period of market stress as a whole in the Indian Stock Market) stands rejected.

3. Non-linear relationship has been found in LC, MC and SC stock returns dispersion and market return during the up, down and whole study period as per “CCK (2000)” model as the values of $\beta_1$ coefficient comes (-0.14, -0.03 and-0.12); (-0.08, 0.10 and -0.04) and (-0.10, 0.17, 0.00). But the coefficient of squared term of the market return dispersion $\beta_2 (0.14, 0.05 and 0.11); (0.14, 0.06, 0.11) and (0.14, 0.04 and 0.10)$ come positive for all the three categories of the companies. This confirm the rejection of hypothesis ($H3_b$: There is a significant non-linear pattern of herding as per their firm size in the Indian stock Market). Hence, herding in not found in LC, MC and SC stocks for the period of study.

4. When comparing the pre-crisis, during crisis and after crisis period, standard deviation comes high in pre and after crisis period for small-cap stocks. During the crisis periods, mid-cap stocks have more standard deviation.

• Herding has not been found even in pre-crisis (1999-2007), during crisis (2008-09) and after crisis (2010-2014) periods for all the three categories of companies.
- The coefficients of $\beta_1$ (0.41, 0.06, 0.05); (0.49, 0.50, 0.46); (0.48, 0.16, 0.20) and $\beta_2$ (0.76, 0.69, 1.45); (0.74, 1.55, 0.56); (0.79, 1.14, 0.97) are positive for all the three types of companies respectively before financial crisis period.

- The values of the coefficients of $\beta_1$ (0.25, 0.25, 0.53); (0.22, 0.13 and 0.16); (0.99, 1.29, 1.08) and $\beta_2$ (1.36, 1.81, 2.73); (1.13, 1.34, 3.27); (0.98, 1.75, 1.77) are positive for all the three types of companies respectively during financial crisis period.

- The values of $\beta_1$ (0.23, 1.30, 1.31); (0.18, 0.26, 0.22); (0.12, 0.30, 0.30) and $\beta_2$ (0.14, 0.07, 0.16); (0.19, 0.28, 0.10); (0.03, 0.71, 0.47) comes positive after financial crisis period for large-cap, mid-cap and small-cap companies respectively. The positive and significant values rejects the hypothesis (*H3d*: There is significant presence of herding as per their firm size in pre-crisis, during crisis and after crisis periods in the Indian Stock market).

Therefore, this shows that Indian investors are rational investors. They have full information about the market. They evaluated all the options while making the investment. Hence, they don’t follow others rather made rational decisions.

The summary of hypotheses and results for the third objective:

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Impact</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>H3a</em>: There is a significant relationship between the firm size and herding in the period of market stress as a whole in the Indian Stock Market.</td>
<td>Positive and Significant for Large, Mid and Small-cap Firms.</td>
<td>Rejected</td>
</tr>
<tr>
<td><em>H3b</em>: There is a significant non-linear pattern of herding as per their firm size in the Indian stock Market.</td>
<td>Negative and Significant</td>
<td>Accepted</td>
</tr>
<tr>
<td><em>H3c</em>: There is significant presence of herding as per their firm size in bullish market condition and bearish market condition in the Indian Stock market.</td>
<td>Bullish market = Positive and Significant. Bearish Market = Positive and Insignificant</td>
<td>Rejected</td>
</tr>
<tr>
<td><em>H3d</em>: There is significant presence of herding as per their firm size in pre-crisis, during crisis and after crisis periods in the Indian Stock market.</td>
<td>Before Crisis = Positive and Significant for large, mid and small-cap During and After Crisis = Positive and significant for large, mid and small-cap firms</td>
<td>Rejected</td>
</tr>
</tbody>
</table>

Source: Researcher’s Own Compilation
8.3.5. Industrial sectors and herding

To invest in stock market is a difficult task as everyone is not fully aware about the market fundamentals and the laws related to the companies. To invest in which type of the stock is a very difficult question. Investors often invest in stocks of particular industry like technology sector, banking sector and pharmaceutical sector etc. “To buy or sell the same stocks by a group of investors over a period of time is known as industry herding (Ganesh et al., 2016)”. There are very few studies that have examined the presence of herding as per the industrial sectors in respect of the stock markets of emerging economies such as India as most of the studies pertain to the developed markets. The growing importance and scant literature calls for investigating the presence of herding in the manufacturing and non-manufacturing sectors of Indian stock market in different market conditions and periods. The sample companies of the study i.e. 270 companies have been divided on the basis of NIC code list as manufacturing and non-manufacturing. There were 182 manufacturing, 75 non-manufacturing and 12 diversified companies found. But the study has considered only manufacturing and non-manufacturing sectors and ignored the diversified companies to examine the impact of industry groups on herding. Following the methodologies of “CH (1995) and CCK (2000)” separate regression equations have been run for the manufacturing and non-manufacturing companies respectively for the different market periods and conditions. The results of these models have been found as follows:

1. Cross-sectional standard deviation of the non-manufacturing companies (1.67) has been more as compared to manufacturing companies (1.02) for the period of study.

2. As per “CH (1995) model”, herding has not been found in the manufacturing as well as non-manufacturing companies. The regression results are shown below:

   - The positive and statistically significant coefficients at all levels of significance $\beta_1 (0.25, 0.59, 0.72)$ and $\beta_2 (0.54, 2.19, 3.77)$ for all three criteria of manufacturing companies show that the equity returns dispersion, in reality, incline towards higher side as opposed to diminish amid extreme market movements.
• The coefficients of $\beta_1 (0.25, 0.72, 1.01)$ and $\beta_2 (0.29, 0.51, 1.92)$ are positive and significant at all levels of significance for all three criteria based on daily data of non-manufacturing companies and rejected the hypothesis (*H*₄ₐ: There is significant presence of herding in the period of market stress as a whole in the manufacturing and non-manufacturing sectors of Indian stock market).

3. As per “CCK (2000) model”, linear relationship has been found in the manufacturing and non-manufacturing companies during different market periods and conditions as follows:

• The values of the square term of market return $\beta_2 (0.00, 0.01, 0.01)$ are positive and significant at all levels of significance using bullish market data but positive and insignificant for daily and bearish market, signifies absence of herding in manufacturing sector of Indian stock market for different market conditions in the period of study.

• The value of the square term of market return $\beta_2 (0.01, 0.00, 0.02)$ are positive and statistically significant at all levels of significance using bullish and bearish market data but positive and significant only at 10% level of significance for the daily data, indicate the absence of herding in non-manufacturing sector of Indian stock market for the period of study.

Hence, the hypothesis *H*₄₉: There is significant non-linear pattern of herding in the manufacturing and non-manufacturing sectors of Indian stock market stands rejected.

4. Herding has also not found during extreme bullish and bearish market conditions as per “CCK (2000) model” in both manufacturing and non-manufacturing companies as

• The values of the coefficient $\beta_2 (0.13, 0.43, 0.43)$ and $(0.06, 0.09, 0.19)$ are positive for manufacturing sector during the extreme up and down market respectively;
The values of the coefficient $\beta_2 (0.03, 0.03, 0.04)$ and $(0.03, 0.03, 0.03)$ came positive for non-manufacturing sector during the extreme up and down market respectively.

Thus, the hypothesis \((H4c: \text{There is significant presence of herding in bullish market condition and bearish market condition in the manufacturing and non-manufacturing sectors of Indian stock market})\) is rejected.

5. Financial crisis also don’t have any effect on the Indian investors as herding has not been found in pre-crisis, during crisis and after crisis period.

- The coefficients of $\beta_1 (0.37, 0.51, 1.12); (0.30, 0.35, 0.71)$ and $\beta_2 (0.78, 1.29, 1.41); (0.52, 0.66, 1.36)$ are positive respectively for the manufacturing and non-manufacturing sectors before the financial crisis period.

- The values of the coefficients of $\beta_1 (0.57, 0.90, 1.53); (1.04, 1.92, 2.83)$ and $\beta_2 (0.84, 1.45, 1.97); 0.67, 1.51, 3.33)$ are positive and statistically significant at all levels of significance for both manufacturing and non-manufacturing sectors of Indian stock market during the crisis period.

- The values of $\beta_1 (0.25, 0.59, 0.72); (0.09, 0.37, 0.44)$ and $\beta_2 (0.54, 2.19, 3.77); (0.20, 0.47, 1.06)$ came out as positive after the financial crisis period.

All the positive and significant value of coefficient rejected the hypotheis \((H4d: \text{There is significant presence of herding in pre-crisis, during crisis and after crisis periods in the manufacturing and non-manufacturing sectors of Indian stock market})\).

This seems that Indian investors are rational and they made full use of their own information while making the investment.
### Table 8.4: Summary of Hypotheses and Results as per Industry type

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Impact</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>H4:</strong> There is significant presence of herding behavior in the manufacturing and non-manufacturing sectors of Indian stock market.</td>
<td>Positive and Significant</td>
<td>Rejected</td>
</tr>
<tr>
<td><strong>H4a:</strong> There is significant presence of herding in the period of market stress as a whole in the manufacturing and non-manufacturing sectors of Indian stock market.</td>
<td>Positive and Significant</td>
<td>Rejected</td>
</tr>
<tr>
<td><strong>H4b:</strong> There is significant non-linear pattern of herding in the manufacturing and non-manufacturing sectors of Indian stock market.</td>
<td>Positive and Significant</td>
<td>Rejected</td>
</tr>
<tr>
<td><strong>H4c:</strong> There is significant presence of herding in bullish market condition and bearish market condition in the manufacturing and non-manufacturing sectors of Indian stock market.</td>
<td>Bullish market = Positive and Significant. Bearish Market = Positive and Insignificant</td>
<td>Rejected</td>
</tr>
<tr>
<td><strong>H4d:</strong> There is significant presence of herding in pre-crisis, during crisis and after crisis periods in the manufacturing and non-manufacturing sectors of Indian stock market.</td>
<td>Before and During Crisis = Positive and Significant. After Crisis = Positive and Insignificant</td>
<td>Rejected</td>
</tr>
</tbody>
</table>

Source: Researcher’s Own Compilation

### 8.4. Conclusion

In economic and social life, humans tend to imitate the ideas of their peers or follow what is happening around them. Mostly the individual tries to follow the footsteps of their predecessors and this reflects upon their choices. “Herding portrays how individuals in a group can proceed collectively without planned direction. Herding refers to replicate the actions of others without considering their own opinions, beliefs and information. “In a market setting, herds are characterized by individuals who suppress their own beliefs and base their investment decisions solely on the collective actions of the market, even when they disagree with its predictions (Christie and Huang, 1995)”. “In stock markets, when individuals feel indecisive, they follow others and ignore their own information to earn maximum returns. These decisions lead to market inefficiency (Saxena, 2015)”.
Foreign institutional investors are an integral part of the securities market and play a major role in growth of economy. As Indian stock market has a strong influence in the Global financial sector, there are large numbers of foreign investors invest in the Indian stock market. However, Indian stock market, being the emerging stock market, is not considered to be mature enough and assumed to be riskier than other developed world stock market. Researching herding in Indian stock market may help grow new bits of knowledge with respect to the effectiveness and in addition risk profile of Indian market which may guide an investor to form a proper investment strategy.

Presence of herding reflects inefficiency and volatility in the market. The present study reports that herding in not present in the Indian stock market in different periods and conditions. It has not been found in bullish and bearish market and even in pre-crisis, during crisis and after crisis period. When the impact of turnover rate, firm size and industry type on herding has been measured, it has been observed that herding is not present in either of the situation. Herding is neither noticed in high and low turnover companies nor in large-cap, mid-cap, small-cap, manufacturing and non-manufacturing companies. Hence, Indian stock market has to be considered as rational stock market.

The study concluded that Indian investors don’t mimic the actions of others rather they believed to invest according to the information available to them. Institutional investors are considered to be more rational than the retail investors as they have more access to the information regarding market fundamentals. The institutional investors have a major share in the Indian stock market; therefore the study does not found herding in Indian stock market in different periods and conditions.

8.5. Limitations

The study has following limitations:

1. The study focused on the National stock exchange and didn’t cover the other major stock exchanges of India like Bombay stock exchange. Thus, the results are not generalized to the whole Indian stock market.
2. The current study implemented two return dispersion models of herding viz. “Christie and Huang (1995), Chang, Cheng and Khoranna (2000) to examine the herding in the stock market. There is also a state space model given by Hwang and Salmon (2004), which may have varying conclusion to capture Indian stock market.

3. The current research encompasses sixteen years (1999-2014) for studying the herding behavior of investors in Indian stock market. So, the results are not applicable to any other time period.

4. The current research comprises NSE 500 index companies of the National Stock Exchange of India for studying the herding bias. There are 1600 companies listed on National Stock Exchange, and a larger sample by considering other indexes may yield better estimates of the results.

5. The data has been retrieved from the “PROWESS” database with due care expecting that information is accurate, exact and finish in all view points. Be that as it may, confinements remain for those errors and mistakes which have been accidentally ignored.

6. The current research is confined only to Indian stock market due to the non-availability of data sources for other emerging economies.

8.6. Implications and Suggestions

The present study has implications for the various stakeholders like investors, portfolio managers, academicians and policymakers.

1. The study provides guidance to the new investors and enlightens them about the risk associated with herding. It encourages them to invest confidently in the market by following the fundamentals which, in turn is beneficial for them and market.

2. Institutional investors play significant role in Indian stock market. By comparing the results of the studies of other countries with the present study, foreign institutional investors can choose the more profitable market for their investment. As the institutional investors are considered to be more rational and better informed about the market fundamentals, their large contribution makes the Indian stock market more rational and efficient.
3. Now days, investors are eager to earn maximum returns on their investments. Along with choosing the financial products themselves for their investment, they are also looking forward for better management of their assets by taking the advice and help of portfolio managers. Managers help them in earning maximum returns by providing them with the profitable portfolios. Since the present study validates the traditional finance theories (Capital Asset pricing model, Efficient Market hypotheses) and establishes the efficiency of Indian stock market, Portfolio managers have a better understanding with the investors and can effectively manage their portfolios.

4. As the study investigate the herding as per trading volume, firms size and industry type, the investors can take the advantage to choose the most profitable options for the investment purposes. The results of the study provide the investors to choose among high or low volume companies, large, mid and small cap companies and also to which industry they can invest as per their risk return preferences.

5. Academicians can also take the advantage of the present study. Very few studies have been done so far in the Indian context. There is a huge scope for researchers to study the herding behavior of investors in the Indian stock market. The academicians can use the results of the present study to explore this topic in the future for different time periods, different indices and also for different types of investment products.

6. The major industry players need to be made aware of the potential influence they have on the public and the need to exercise caution when interacting with the less knowledgeable public. They represent the knowledgeable market participants whose opinions and decisions are likely to be imitated by other market participants leading to herding.

7. Being aware of behavioural biases is the crucial step in ensuring that the decision making process is not adversely affected by them. Rational decisions are more likely when there is sufficient information available to decision-makers and when that information is presented and analyzed to recognize common pitfalls.
8. Investors should be aware of the potential impacts herding can have in their investment decision making process at all levels, either as individual or institutional investors trading in the stock market.

9. SEBI plays an important role in regulating and controlling the stock market in India. It also protects the interest of investors. Introducing transparency in the information system makes the Indian stock market more efficient. The investors can use the information about the companies; share prices etc. while making their investments and earn maximum profits. So, it helps in increasing the confidence level in investors and makes the market more efficient.

The results of the study showed the absence of herding in different market conditions and periods. The study proved that Indian stock market is one of the efficient emerging markets as the investors have sufficient information available because of the strict laws and regulations made by the regulators of the market such as SEBI, Companies Act and RBI.

8.7. Scope for future research

The present study investigated the herding in Indian stock market in different market conditions and periods i.e. during bull and bear markets and also in pre-crisis, during crisis and after crisis periods. The impact of trading volume, firm size and industrial sectors on herding during different market conditions and periods has also been investigated. For this, secondary data for the companies listed on NIFTY 500 index during the period 1999-2014 has been collected from the “PROWESS database”. Two return dispersion models “Christie and Huang, 1995 and Chang, Cheng and Khorrana, 2000” have been used to investigate the herding in Indian stock market.

The regression equations given in these two models have been run using the software EVIEWS 8.0. The study established the absence of herding in Indian stock market in different market conditions and periods. No impact of trading volume, firm size and industrial sectors on herding has been found in any of the cases i.e. no herding in high and low trading companies, large-cap, mid-cap and small-cap companies as well as in manufacturing and non-manufacturing sectors. So, the study found that there are rational investors in the Indian stock market in different situations and criterions.
Though the results of the study have many practical implications and significance for the investors in Indian stock market, but due to limitation of time and scope, the following is a list of some issues which can be taken for future research:

1. The present study can be replicated to study the other indices like BSE SENSEX, NIFTY 50, NiftyBank index and may others of the Indian stock market since the current study is done on only CNX 500 index.

2. By doing the primary study, various psychological factors can be studied by the researchers that affect the trading behavior of retail investors which may or may not cause herding bias in the stock market.

3. Researchers can also expand the present study by analyzing stock exchanges of different nations for a relative examination with Indian stock market.

4. The same study can be replicated having large sample size. A large sample may have better estimates of the outcomes. Likewise, time period of study can also be increased for determining the better results in future.

5. As the present investigation encompasses market wide herding by taking into account both individual as well as institutional investors, there is a scope to break down and concentrating on each type of investor separately.

6. The present study used only two return dispersion models like “Christie and Huang, 1995 and Chang, Cheng, Khorranna, 2000” to determine the herding in the Indian stock market. The researchers can deploy the alternative model like state space model of herding developed by Hwang and Salmon (2004) to replicate the current study.

7. The study can be expanded by taking into account other variables like volatility, impact of financial regulations etc.

8. The behavior of investors can also be determined with the help of event study method based upon certain events that occur in the economy.

9. The impact of the behavior of foreign investors on the development of Indian stock market can also be studied.

10. There is also a need to study the possibility of anti-herding that is largely ignored in the literature. Anti-herding is discussed by Hirshleifer and Teoh (2003). Reserachers can study this topic.
11. The research can also be conducted in future to know the reasons why herding is not present in NSE and what are the other biases present in the securities exchange.

12. There are various products available in the stock market for the investors. The researchers can assess other market products such as Mutual Funds, Futures and Options, Exchange Traded Funds (ETFs) etc. to study the herding bias.

8.8. Summary

Emerging markets are taken as less mature and more risky. Investigating herding in such type of market reflects the position of the market i.e. whether it is efficient or inefficient. The present chapter provides the summarized view of the whole study. While introducing the concept of herding in a brief manner, the chapter provides the summary of all the chapters and the findings of study in a concise way. The hypotheses developed to achieve the different objectives of the study have also been presented in the tabular format. Further, it highlights the concluding remarks for the present study. The limitations of the study are also discussed in this chapter and provide suggestions and implications to the portfolio managers, investors, academicians and policy makers. The scope for the future research has also been provided.

The results demonstrate and establish efficient market conditions of the Indian stock market since there is no trace of herding. Furthermore, the results highlights no presence of herding in different market conditions (bull and bear phases) and periods (pre-crisis, during crisis and after crisis). The study also showcase that investors in Indian stock market are rational and lucid in their approach towards their investment. Because of the expansive extent of investments made by institutional investors in the market, herding isn't pervasive in the Indian securities market (Kumar and Bharti, 2017).
REFERENCES


