Herding Behaviour in Investment Decision Making: A Review

Abstract

Herding denotes how individuals act together in a group without any centralized direction. Herding is widely studied as it drives asset prices away from the fundamental value and there are concerns it leads to volatility, destabilizes market and increases the fragility of financial market. In this paper a concise review of literature of herding is provided. Various types of herding, its significance and occurrences along with the determinants are discussed. Various approaches used for measuring herding have been reviewed. The relationship of herding along with other variables such as market conditions, volatility, and liquidity is reviewed and studied. For the purpose of drafting the review paper, 85 papers for over three decades have been consulted. Further, future research directions are included for the benefit of the academicians, researchers and policy makers.

Keywords
Herding behaviour, financial market, volatility, liquidity, behavioural biases

1. Introduction

Herding may be defined as mimicking the act of others in a group. Herding in financial markets has been typically described as a behavioural tendency for an investor to follow the actions of others (1). Among wide perspectives on defining herding, it can be defined in its general form as how individuals act together in a group without any centralized direction. Herding is one of the important behavioural biases affecting investor's decision. Herding as a behavioural bias gained its popularity after being the major reason behind the bursting of dotcom bubble in late 1990. The venture capitalists and private investors invested huge amounts of money into internet companies following the trend without even assuring its financial soundness. Later, in 2008 again herding was attributable to the bursting of Real Estate Bubble. Presently the critics of the crypto-currency boom of recent years suggest that a similar phenomenon may be taking place in that space.

The investment is influenced by the investor's psychology as opposed to classical theory of finance. The classical theory is built upon Efficient Market Hypothesis (EMH). This hypothesis states that available information is the key determinant of prices of all the assets and securities at any given moment of time. Roughly around middle of 1980's the model of efficient market was challenged and led to the emergence of behavioural finance. The prospect theory developed by Kaheman et al. (2) popularised the concept of behavioural finance. The credit of founding the field goes to David Kaheman, Amos Tversky and Richard Thales.

Herding has been put in the category of behavioural biases in the literature. The behavioural biases are the cognitive factors that influence the investment decisions of the investors in financial markets. The behavioural biases locate the causes of irrational and illogical behaviour of the investors and expound how investors logically make faults and mistakes while making judgements. The several behavioural biases that drive bad estimates while taking

investment decisions are Anchoring Bias, Regret Aversion Bias, Disposition Effect Bias, Herding Bias, Hindsight Bias, Self-attribution Bias, Familiarity Bias, Trend-chasing Bias, and Overconfidence Bias. The investors take suboptimal decisions due to the behavioural biases and such decisions on a large scale causes disturbances leading to market anomalies. These anomalies affect the individuals as well as economies health ruinously. The biases ultimately affect the stock prices and stock returns.

For the purpose of conducting review a set of articles for 31 years from 1987 to 2018 were identified and consulted using the keywords such as 'herding in financial markets', 'herding and market conditions', 'herding in commodity markets', ' institutional herding', 'investors herding behaviour'. Furthermore, important financial journals such as 'The Journal of Finance', 'Journal of Banking and Finance', 'International Finance Journal', 'Journal of Basic and Applied Sciences', 'Journal of Emerging Market Finance' and books named 'Thinking, Fast and Slow' by Daniel Kahneman and 'The Laws of Wealth' by Daniel Crosby have been explored to gather the required literature regarding the research topic.

2. Basics of Herding

The origin of herding ages back in 1936 when J.M. Keynes developed renowned "General Theory". According to this theory the long term investors simply follow market in order to ensure healthy investment and professional managers herd so that their reputation is not harmed due to contradictory behaviour. Later herding was defined as "under certain circumstances, managers simply mimic the investment decisions of other managers, ignoring substantive private information" (3). Herding is important and interesting for research for its relation and impact on the stock prices. When investors' decisions to invest in a specific stock unite, the subsequent effect is an augmented demand (4). The fundamental-driven herding is normally functional and helps to determine the prices, whereas imitation-driven herding is normally dysfunctional and can lead to price turnarounds and too much volatility (5). Herding is important and is well acknowledged by the academic researchers; as it affects the stock prices which affect the attributes of risk and return models and ultimately affects the asset pricing theories (6).

Herding can be sorted under two heads: rational herding and non-rational herding. These two concepts describe the origin of herd behaviour (7). The rational concept can be described as investors embracing other investors' investment decisions to protect their own interests and enhancing their reputation among other investors (3).

The rational herding typically emerges from direct payoff externalities, principal-agent problems or informational learning (cascades). In direct payoff externalities the individual decisions affect the payoffs to other which lead to convergence or divergence of investor's behaviour. There are adverse externalities in case of bank runs; favourable externalities in the generation of trading liquidity or in information procurement. In principal-agent problem the investor's decision relies on their desire to protect the reputation in line with another observer. In informational learning, investor's decision does not rely on their own personal indicators as it is believed that other investor's actions, payoffs, or even discussion is more significant (7). The three probable causes for rational herding are incomplete information, reputation concern, and compensation structures (5). Herding based on imperfect information is termed as information cascade models. According to these model, investors herd as they believe others being more valuably informed than them (3 and 10). Herding as a concern for reputation, investors herd as they believe their reputation will be spoiled if their decisions are not correlated with other

investors (3, 10). Herding based on compensation structure, fund managers herd as they believe that their compensation is tied to the decisions of other professional managers (5).

The non-rational view focuses on investor psychology which exhibits the role of agents as lemmings, blindly following others and ignoring the rational reasoning. According to the intermediate view the investors decision are near-rational that uses 'heuristics' to cut down information handling or information procurement costs, and that third-party rational activities cannot eradicate this impact. The irrational herding occurs when investors with inadequate information and insufficient risk assessment neglect their previous beliefs and blindly imitate other investors' action. The irrational herding can be described as investors blindly copying other decisions, despite having their own information (4). The non-rational view of herd behaviour focuses on investor psychology and assumes that investors behave like imitators, ignoring all rational analysis and following others blindly (7).

3. Types of Herding

Herding in the financial markets can be studied under various heads. The most important types of herding are market wide herding, institutional herding, mutual fund herding.

3.1 Market Wide Herding

Market wide herding is defined as, "the collective behavior of all participants towards the market views and therefore buying or selling a particular asset at the same time" (11). In the U.S. equity Real Estate Investment Trust (REIT) market; market wide herding was present in high quantiles of REIT return dispersion. Asymmetry of herding behavior was more likely to occur and was stronger in rising markets than in the declining markets; investors do not herd in case of extreme turbulent conditions while they herd when market conditions were moderately turbulent (12).It was established that the market wide herding exists in the Indian market, but is not very severe and FII (Foreign Institutional Investors) flows did not significantly influence the herding behaviour; i.e., overall market-level herding was not impacted whether the FII flows rose or fell. Interestingly, the mutual funds increase the propensity to herd and their influence of volatility is significant; it has been suggested that the regulators need to lookout for herding tendency when volatility shoots up (11).

The market wide herding behaviour was studied by many researchers in different financial markets. Literature provides an evidence for the presence of herding in Indian and Chinese stock markets (13), South Korea and Taiwan (14), advanced Stock Markets (except the US) and Asian markets (15), Finland, Sweden, Norway and Denmark (16), Amman Stock Exchange (17).

There have been only some studies conducted in respect to Indian market. Some of the important studies that signify the incidence of market wide herding in India in different periods and phases of stock market are (13), (18), (19). Contrastingly, there have been studies that indicate the absence of herding in Indian stock market. The probable reasons for the absence concluded are reforms in Indian stock market and the increased presence of institutional players (20).

3.2 Herding and Institutional Investors

Institutional herding has been defined as "institutional investors following each other into and out of the same securities and institutional investors following their own lag trades" (21). Numerous studies have been conducted in order to find out the influence of institutional herding on the stock prices. The effect of institutional herding is twofold it can either drive the prices

away from their fundamental values (22, 23, 24, 25, 26, 27, 28, 29) or it helps to determine price and improves the market efficiency (30, 4, 31, 21, 32).

The institutional buy herding is consistent with price determination and sell herding is consistent with price distortions and is stronger for high yielding bonds, small bonds and illiquid bonds during financial crisis (33).

3.3 Herding and Mutual Funds

Herding behaviour has also been studied in the mutual fund industry, to study if the professionals who are supposed to be tremendously rational and knowledgeable display the herding behaviour. Mutual fund makes up a large percentage of trading capacity and their behaviour influences the market prices. Literature provides evidence for presence of herding behaviour among Chinese Investment Funds (34), Portuguese Mutual Funds (35), mutual fund industry of Finland (36), Australian Mutual Funds (37), Japanese Mutual Funds (38), US Mutual Funds (39, 40), German mutual funds (41), Swedish Mutual Funds (42), Spain Equity Funds (43),Greek Mutual Funds (43), Indian Mutual Funds (44).

Mutual fund herding is also being studied in order to figure out relationship between herding and types of funds, herding and personality traits of institutional managers. Mutual fund herding for large capitalisation shares was more prominent in all periods than the small and medium capitalisation shares (44). Fund managers herd more while purchasing a stock and trading voluminous stocks as compared to trading a stock (45). The fund managers herd in order to safeguard their careers and get immunity in numbers. Thus career immunity is the main reason of herding and the inexperienced managers herd more as compared to the experienced managers (46). Institutional managers destabilise the stock prices, they follow analyst recommendations while trading which ultimately affects the stock prices. When unskilled managers overreact to the analyst revisions the stock prices show great reversal (23). Herding by actively managed equity funds disturbs their performances and flows, but no direct positive correlation between herding behaviour and fund performance have been established. It was found that on average, funds that trade with the herd benefit from this behaviour. The funds that lead the herd earn no abnormal returns while the funds that follow the herd earn negative abnormal returns (47). Poorly performing Mutual funds herd more than well performing funds. Mutual Fund herding is more prominent in down market as compared to the up market. Thus, the poorly performing managers have stronger career concerns and particularly so in down market (48).

4. Approaches to Measure Herding

Numerous approaches have been devised to measure the herding behaviour. These approaches can be classified into quantitative approaches that involve running statistical analysis on data having numerical values and qualitative approaches looking for patterns in non-statistical data.

4.1 Quantitative approaches

Herding as a behavioural effect became popular after Lakonishok *et.al.* (49) studied and designed the most widely used herding measure known as LSV in which 769 tax-exempt pension funds were studied to examine herding, positive feedback trading and its effect on stock prices. The measure estimates the average propensity of specific investors to gather on the similar side of the market in a specific stock for particular period, juxtaposed to what could be anticipated if investors traded solitarily to measure herding. LSV has been criticised for its invalid assumption of binomial distribution while calculating adjustment factor used for correcting randomness,

therefore not being able to segregate the herding bias arising from information cascades, correlated information and linked objective functions and for not specifying the direction of herding. Moreover, the LSV method needs complete accounts of individual trading activities which is quite complicated to obtain the collective behaviour of all participants towards the market views and therefore buying or selling a particular asset at the same time. Further, an intuitive measure of herding based on dispersion, defined as the cross-sectional standard deviation of returns was designed being referred to as CH method in order to test the objective for the presence of market wide herd behaviour during stress. The methodology was based on the assumption that unlike rational asset pricing model, in the presence of herding dispersions increases at a decreasing rate or can even decrease if herding is severe (50). CH method does not incorporate any plan to check for movements in fundamentals, if the market is moving towards or away a relatively efficient or inefficient outcome. Another problem with using CH is that the cross sectional standard deviations are not free of time series volatility in case of individual stock returns. Then, a sign based herding measure known as GTW was devised which provides an indication of whether a specific stock in a fund during a specific quarter follows the crowd or goes against the crowd. In order to detect herding it calculates momentum measures and checking its statistical inference using alternative t and F test derived from a time series procedure (30). It concluded that the tendency of individual funds to herd was shown to be highly correlated with fund performance over the period of study. Since the LSV method does not specify the direction of herding. It was further modified by Wermers (51) in order to distinguish between buy herding and sell herding. It computed the degree to which any subgroup of fund herds in a stock quarter. The proposed method require detailed accounts of individual trading activities which are difficult to gather and might not be available in many cases. Another method in order to examine the herd behaviour of market participants was devised by extending the CH method known as CCK. It assumes that herding in the market implies a non linear relation between return on market portfolio and dispersion of individual assets. For computation of dispersion it uses CSAD which is based on the conditional version of CAPM (14). As compared to CH CCK is less strict for computing market wide herding and is able to compute herding more normal conditions additionally to periods of market stress. Later a new approach known as HS method was proposed for detecting, measuring and evaluating market wide herding towards particular sectors or styles in the market including the market index itself which critically separated herding from common movements in asset returns induced by movements in fundamentals. The methodology was applied in the United States and South Korean stock markets. Herding behaviour towards market was found to be independent of market conditions and macro factors and herding was even present when the market was quiet and investors were confident of market direction. Herding behaviour towards market portfolio was prevalent in both bull and bear markets (51). Unlike CH, HS method focuses on cross sectional variability in factor sensitivities (betas) rather than market returns and thus, HS method is free from the influence of idiosyncratic components. HS method provides more depth examination of the dynamic evolution of herding prior, later and during the crisis. The data for HS method is easier to obtain and is based on observed returns and does not require the detailed accounts of individual trading activities. Moreover, the HS method is able to detect herding even when the market is silent and investors are certain about the market trend which cannot be detected in CH method.CH and LSV method try to discover herding in absolute terms while HS method assumes that herding should be viewed in the relative sense rather than absolute and that no market will be ever entirely free of herding. Hwang and Salmon proposed a non parametric method of

computing herding for slow moving herd behaviour in the market and evidenced that herding was more apparent when investors felt confident on the future direction of the market and further evidence that the proposed herd measure is robust to business cycle and stock market movements i.e. opposite to popular assumption that herding is significant when the market is in stress. The proposed method is more versatile as it does not assume any specific parameter dynamic process for herding (52).

4.2 Qualitative approaches

Herding can also be measured using qualitative approaches. Some of the authors have used survey methods to collect the primary data to find out if herding and other behavioural biases are present among the investors and how it influences the performance**.** Interacting directly with the investors is the most appropriate method to extract the opinions and analyse them. Since the behavioural biases explore the psychological attitudes of investors, primary data is more likely to accurately reflect the inner motivation of investors.

An experiment was being designed and conducted to observe the herding behaviour, information uncertainty and investor's cognitive profile in three settings, each with different level of information. The experiment being conducted confirmed the relationship among the three phenomenons. The information concerning the number of previous transactions relevantly explains herding behaviour (53).

Collecting the data via self computation questionnaire is the most appropriate and unbiased method. The research questions can be defined clearly and represents standardized data. The method is less expensive and saves time. The respondents can even provide the sensitive information without hesitation and can be filled by them at their free time. A questionnaire consisting of sixty three items dealing with six biases was developed to study the psychological and demographic determinants of individual decision making in Tunisian Stock Exchange. Significant evidence was found for both behavioural and demographic biases. It was observed that the behavioural biases that affect investors' decisions are: representativeness, herding attitude, loss aversion, mental accounting, and anchoring. The investor's decision is not fully rational but governed by psychological biases studied under the behavioural finance (54). Another questionnaire consisting of thirty-six items divided into three sections was developed to study the behavioural biases among Indian investors. The first section of questionnaire provides personal information and the other two sections consist of scenario based questions related to hypothetical stock market. The study confirmed strong presence of overconfidence, excessive optimism, disposition and herd behaviour as the major behavioural biases affecting investors' decision. It was also observed that there was significant relationship between demographics, investor characteristics and behavioural biases (18). An additional eighteen item questionnaire in the Vietnamese version based on the theories of behavioural finance was developed. The six point likert rating scale was used for asking respondents, opinions and attitudes in order to find out behavioural biases affecting the individual investors. It confirmed the presence of herding, prospect, and overconfidence and anchoring bias (55). Furthermore, a questionnaire consisting of twenty eight questions with nine items concerning to herding effect was developed to study the effects of market variables and herding on investment decisions in Tehran Stock Exchange and how it influences the investment performance. Market variables and herding both had a positive effect on the investment decision but market variables had a higher influence and investment decisions positively influenced the investment performance (56**).** Another survey was conducted in Karachi Stock Exchange to study the role of behavioural biases in investment decision making and moderating role of investor's type. A Two stages least square method was used to examine

the moderating effect of investor's type on relationship between behavioural biases and financial decision making. Significant evidence of positive impact of disposition effect, herding and overconfidence was found in investment decisions. It was concluded that passive investors show more herding bias and active investors show more overconfidence bias (58). Later a questionnaire comprising of straight forwards questions related to investors' personal information and various behavioral biases was devised to determine the psychological factors affecting decisions of Indian individual investors grouped into two categories based on experience. All questions were designed on five point likert scale. Significant evidence was found for herding to be present among both groups in an equal manner but loss aversion bias, regret aversion bias, anchoring bias were present more with experienced investors than the less experienced investors (58).

The qualitative methods can be criticised on the upcoming grounds. The respondents might give socially acceptable responses being reluctant to admit their biases. This can be minimized to a certain extent by not asking the questions directly and giving them the situations but cannot be eliminated. The responses are gathered in a relaxed environment which can be totally in contrast with the responses in a stressful market environment. Moreover, the herding can be a stock specific phenomenon i.e. the investor herds only in 3 out of 8 stocks. The tendency to herd varies according to stock subject to limited information, new technology. The primary data collection methods are unable to figure out such stock specific herding.

5. Herding and Market Conditions

Around the time the researchers were conducting studies in order to study the relationship between herding behaviour and market conditions. This relationship was studied in terms of returns, volatility and volume of transactions. The findings of different authors to study this relationship are as follows:-

Author	Year of Research	Place	Method	Findings
(50) Christie and Huang 1995	1995-1998	New York Stock Exchange	CH	Individual returns do not cluster around market return during market stress.
(14) Chang et al. 2000	1963-1997	International markets (US, Hong Kong, Japan, South Korea, Taiwan)	CCK	Herding in South Korea and Taiwan. Security returns dispersion was higher in up markets.
(59) Gleason 2003	1995-2002	European Future Market	Christie and Huang (1995)	No herding in European Futures Market. Dispersion increases during extreme market conditions.
(16) Lindhe 2012	2001-2012	Nordic countries namely	Chiang and Zheng (2010)	Herding in Finnish market. Herding was more prevalent during large market

		Denmark, Finland, Norway and Sweden		movements. .
(60) Ouarda 2013	2001-2012	European Markets	Christie and Huang (1995) and Chang et al. (2000)	Herding influenced by the sub-primes crisis in the finance and technology sector. Strong herding sharply contributed to a bearish situation characterized by a strong volatility and a trading volume.
(61) Mobarek 2014	2001-2012	11 countries of Europe	Chiang and Zheng (2010)	Herding apparent in Financial Crisis and in continental countries.
(62) Blasco et al. 2017		35 International Markets		Herding behaviour affected by cultural and various environmental and organisational factors (training, business conditions and styles, governance, technology, education and development of equity and non equity markets).

The relationship between herding behaviour and market conditions is asymmetrical and conditional of if market is rising or falling. Many researchers remarked that herding was stronger during rising market. This was evident in Athens Stock Market (63), Australian Stock Market (64), Turkish Stock Market (65) and Chinese Stock Market (24).The probable reason for this effect is that it is produced by 'flight to safety' of the market consensus during "bad times" (66). Contrastingly there have also been researches that concluded, herding was stronger during falling market. This was evident in Taiwan spot and future market (67), eleven European Markets (62). The probable reason for this effect can be that humans react to losses more enormously than gains (68).

6. Impacts of Herding

Herding is an endogenous instrument of financial instability which increases the volatility and the amplitude of financial system. The asset prices become extremely volatile when the noise traders occur in the market and this volatility cannot be accounted to news i.e. the fluctuations are more than it can be explained taking into account only the changes in fundamental values (69). It was proved that the substantial share of movement in prices cannot be accounted to news related to weather (70), future dividends and discount rates (71). When large fraction of investors allocates a constant share of their wealth to stocks, then even a small portion of noise traders can have a great impact on prices. Thus, the impact of noise increases when the proportion between sophisticated and noise traders decreases. It was also observed that volatility was higher in transparent markets i.e. where traders can observe the prices and past actions of other market participants than the opaque market (72). Volatility has opposite relation with volume traded and negative relation with trade size (63). It is said that informed traders usually trade in higher volume as compared to the uninformed traders. Thus, higher the amount

of informed trading lesser is the volatility and higher the amount of uninformed traders higher is the volatility (73 and 74).

Thus, many studies stated that volatility rises with uninformed trading (73 and 74) and some others relate volatility to be directly and positively related to herding (75, 76).

Further, it was studied that price impact of herding is asymmetrical. The buy herding aids price discovery and it is permanent while the sell herding results in temporary yet significant price distortions. Thus, the sell side herding poses substantial risk to financial stability. When investors herd to sell, the stock prices fall significantly during that period but reverse slowly over upcoming quarters. This result is true in equity market (40, 28, 26, 23) but is much stronger in magnitude in institutional market (33). . The price destabilizing effect of sell herding was found to be particularly strong for high-yield bonds, small bonds, and illiquid bonds and during the recent global financial crisis (33).

Herding has a negative relationship with market liquidity i.e. in the presence of herding behaviour the liquidity of market decreases (66).as the liquidity of market is measured by the bid-ask spread (77). The larger spread results into higher adverse selection costs and ultimately lowers the liquidity of market. Not much literature is available on the relationship between herding and liquidity. The field needs to be explored and can be taken up by future researchers.

7. Future Research Directions and Conclusions

A number of futuristic research issues can be extracted from the above text. Firstly, quantitative measurement of herding is still elusive of perfection. Measures suggested by Lakonishok (49), Christie and Hwang (50), GTW (30) and Wermers (51) come with a number of limitations (14, 53, 15, 11). Although these techniques have seen improvement over a period of time but there is a definite scope on the side of mathematical frontier.

Secondly, there are very few studies based on qualitative measurement of herding at individual investor (78). Qualitative measurement involves the use of primary data. Therefore, there is a pertinent need to further research on qualitative dimension of herding behaviour. Herding is treated as a behavioural dimension; therefore, further research may be directed at studying the relationship between herding tendency and other personality traits of an individual. Further, tendency to herd may be affected by other variables such as wealth, status, risk taking ability, stage of life cycle, knowledge quotient etc. Studies on these aspects can be a worthwhile contribution to the current body of knowledge concerning herding.

Thirdly, the domain of herding may be studied from cross cultural dimension. There can be differences/similarities in the tendency to herd on account of national economies, socio cultural variables, and maturity of stock markets and level of economic development. Existing literature provides evidence of research on herding largely from the developed countries (11, 79). But the domain of herding remains relatively lesser explored in context of emerging economies such as India.

Herding is a phenomenon that affects stock prices movements and leads to volatility has the potential to destabilize financial markets and increases the fragility of financial system. Therefore, further research may be undertaken to study the link between herding bias and future stock returns (22). Allowing forecasting future stock returns with higher surety. Appropriate policies may be formulated helping to protect the financial system from vagaries of herding and building a sturdy and robust financial system for the economy.

Competing Interests

I hereby declare that both the authors do not have competing interests.

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