

## Influence of social interaction on behavior of small investors in capital market

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**Abstract:** This study deals with the relationship between human behavior, influenced by social interactions, and stock market participation of individual investors in Indian capital market, herding Informational cascades and contagion have been documented in many recent research papers. As a proxy of social influences on decision making we have made an attempt to study its impact on investment decision making of Indian investors responses have been collected from the four states of eastern India namely: Jharkhand, Bihar, Orissa and West Bengal and to stabilize the relationship between the variables Factor analysis and multiple regression Analysis have been used. Result shows that all the three factors have highly positive influence on investment behavior of investors. Further it was also inferred that investors base their decisions on the stock volume and trading behavior of others and also they ignore their private information and follow their peer groups.

**Key words:** Individual investors; Human behavior; Social influences; Herding; Informational cascades; Contagion; Capital market

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### 1. Introduction

In societal setting individuals' often interact with their peer groups, discuss, exchange information and make decision. Social influence is all about how our thoughts, feelings and behavior changes in the presence of others. It refers to any effect that another person or group has on one's own attitude and behavior. This pattern is also followed while making investment decisions where investors interact, discuss stocks and make decisions. So the stock market can be viewed as a system of human interactions (Hirschey and Nofsinger, 2008). Hence, investment decision making of individual investors can be conceptualized as a complex decision-making behavior which is influenced by rational and irrational factors which contribute to inefficiency of stock markets. The state of optimism social mood encourage more investment, fosters risk seeking behavior, all the economic participants – individuals, corporate, banks try to extend their tentacles and create the situation of market bubble, as this situation washed out the social mood as well stock market begins to readjust itself.

Relating economic equilibrium to social equilibrium Pareto (1963) said "state of economic system may be regarded as particular case of the general state of the sociological system." Nofsinger (2005) proposed that the physical approach to modeling stock market behavior is to examine it from the prospective of economic fundamentals that drive their actions, but how investors think about stock market fundamental is influence by their

interaction with others". Keynes identified sociological forces affecting investors, for example the socially propelled conventions that, in times of uncertainty, encourage speculators to believe what others believe and to do what others do (Keynes 1930, 1936, 1937). Following this approach, other economists, including Minsky (1975) and Kindleberger & Aliber (2005), have analyzed the socio-psychological impacts of emotional contagion identifying the speculative euphoria which spreads through groups of investors during manic phases as a crucial catalyst in economic and financial booms; in turn, excessive pessimism and extreme risk aversion precipitate bust phases. Social interaction and societal presence of people are being incorporated into capital market investing by most of the financial practitioners and researchers now a day and this new paradigm of research is responses to the difficulties faced by the traditional financial theories.

In this paper we seek to establish a causal relationship between individuals and community stock participation in India. In particular we study the extent to which an individual investor is more likely to influence its investing decision when a higher fraction of investors are more in a particular direction of investing. If such a relation exists then it is obvious that there might be externalities which impact individual investors in decision making and it also reject the well-established hypothesis of market efficiency and investors rationality. Social influences, personality traits like age, gender, marital status etc. and other behavioral dispositions are considered

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important in many studies to define the human behavior and have been documented early researchers (Campbell, 1963; Sherman and Fazio, 1983; Ajzen, 1988) in their studies. Social influences herding (Hirshleifer et al., 1994), informational cascades (Shiller (2000)), and emotional contagion (French and Poterba (1991), Tesar and Werner (1998), and Ahearne, Grier, and Warnock (2004)) incorporated with individual investors decision making have been found most important behavioral biases by many researchers, hence an attempt is made in this study to explain the impact of this social influences as a proxy for three most prominent social biases namely herding, informational cascades and contagion in investment decision making of Indian individual investors.

The assumption of investors prudence supporting the efficient market hypothesis is often challenged in reality as the observed returns display the presence of "herd behavior" in many markets. Herd behavior can be defined as a tendency among a group of individuals to imitate the decisions of others ignoring their own beliefs or information (Bikhchandani & Sharma, 2000). In addition, (Nofsinger & Sias, 1999) suggested herding behavior occurs when investors trade in the same direction over time. The reasons for herd behavior are diverse it may be to protect reputation or to protect remuneration (institutional investors). Bikhchandani and Sharma (2000) make a distinction between investors who face a similar information set driven by fundamentals ("spurious" herding) and investors who intentionally copy the behavior of others ("intentional" herding).

Information cascades have been identified in the literature as times where informed traders ignore their own private signal of information and trade in response to observed trades in the market. An individual considers it optimal to follow the behavior of his predecessors without regard to his private signal since his belief is so strongly held that no signal can outweigh it. The result is that trading does not incorporate information and prices can move away from fundamentals. Avery and Zemsky (1998) argue that information cascades will be short-lived and fragile as one contrarian trade from the herd can quickly stop an information cascade.

Again the concept of informational contagion deals with the correlation between the cross countries stock markets at the time of crisis. The information (bad) travels through the investors like an epidemic and impact their decision making globally. Loretan and English (2000), Forbes and Rigobon (2002) and Boyer et al. (2006) address the issue that increased correlations between returns in different stock markets in times of extreme downturns can be attributed to the increase in volatility during these periods. The increase in the probability of crisis, beyond the linkages in fundamentals, and the rapid increase in co-movements among markets during a crisis episode (Bekaert et al., 2005; Forbes and Rigobon, 2002). Rodriguez (2007) uses copulas to measure

contagion and finds evidence for contagion based on changes in dependence of extreme returns. Boyer et al. (2006) investigates the spread of crises through asset holdings of international investors, and find that this is additional channel through which crises can spread.

Andersen, Bollerslev, Diebold, and Vega (2007) examine the responses of German, US and British government bonds, stocks and exchange rates to US macroeconomic news in the period 1992-2002. The authors observed that the correlations between stocks and bonds are negative across the full sample and recession periods, but positive in the expansion period. When conditioning on the state of the economy, it is found that bond markets are most responsive to news, while equity and foreign exchange markets are equally responsive.

## 2. Statement of the problem

The decision making process cannot be predicted merely on the basis of traditional financial theories. Many behavioral researches have shown that neither the investors are fully rational nor the market is efficient evidenced from financial crises, market bubbles, and sudden boom and depress. There are other factors which influence the behavioral biases, other than risk and return which impact the investors' decisions. Indian stock market has all the same gears one would expect from any promising market. While proportion of participating investors is low compared with other developed countries, Indian stock market is not intact with international events and behavioral biases which are evidenced worldwide. Therefore it is required to examine the behavioral influences in decision making of Indian investors.

### 2.1. Objective of the study

To study the influence of social factors viz. Herding, Informational cascades and Contagion on investment decision making of individual investors in Indian stock market.

Through this paper we attempt to empirically examine the impact of social influences as: herding, informational contagion, and informational cascades on decision making for investment in stock market in India.

Based on the previous findings and literatures reviewed we have evolved a conceptual framework showing impact of herding, informational cascades and contagion on investment decision making (Fig. 1).

With the framework (Fig. 1) above we give tentative explanation in the form of following hypothesis with accounts for assets of facts and can be tested by further investigation:

H1: Herding does not significantly influence the decision making of individual investors.

H2: Informational cascades do not significantly influence the decision making of individual investors.

H3: Cascading does not significantly influence the decision making of individual investors.

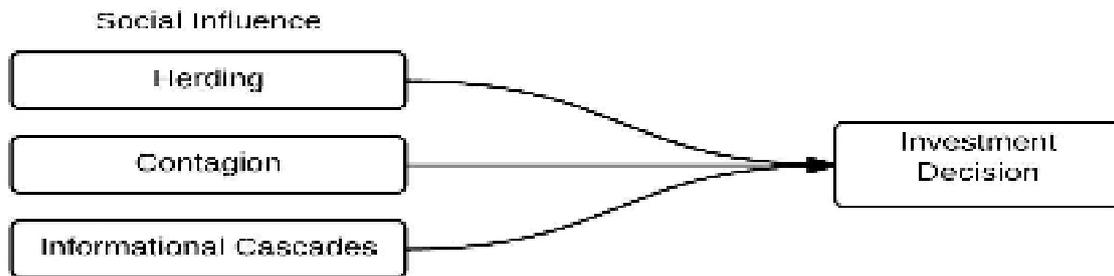


Fig. 1: A conceptual framework of social influences toward investment decision

### 3. Methodology

In order to analyze the relationship between variables undertaken for the study, a descriptive study using primary data was considered appropriate. We use a qualitative procedure in analyzing the data for present study.

#### 3.1. Sample

For this study our targeted population was individual investors of eastern India comprising four states namely Jharkhand, Bihar, Orissa and West Bengal. Since getting responses from individual investors from their places is much time taking and it costlier too and again it is a difficult task to recognize stock market investor, chosen the peoples randomly. So non-probabilistic convenient sampling technique was adopted for data collection. For that purpose we visited to brokerage houses where we could find the investors, who used to present physically for trading there. Further we also obtained the list of the investors who were registered with those brokerage houses and visited them for responses. Branches of brokerage houses like Sriram finance, India Infoline, Icici Direct, Kotak security limited, India bulls and Sherkhan in all the four states were our sample frames. Initially 400 questionnaires were distributed amongst the investors out of which 315 filled questionnaires were collected. Going through the filled questionnaires only 221 were found valid to do the proposed statistical analysis.

For the purpose of studying the objectives and testing the hypotheses, a self-administered structured questionnaire based on literature reviewed was used as an instrument to collect the data. Questions had been framed considering all the three factors of social biases (herding, informational cascades and contagion) as independent variables and questions for extracting the opinion of investor decision making as a dependent variable, total 13 items (see Table 1.) were include in the questionnaire using five point Likert scale viz. 1 = strongly agree, 2= agree, 3 = neither agree nor disagree, 4= disagree, 5= strongly disagree. Validity of questionnaire is the degree to which an assessment measures what it is supposed to measure. Content validity of the questionnaire was established before it was distributed to actual respondents (see Table 1.). As recommended by many researchers (e.g. Tharenou et al., 2007), questionnaire was first, piloted with financial experts, senior brokers, managers of brokerage houses and investors with good experience of stock investing. The purpose of this procedure was to guarantee a good understanding and acceptance by respondents, so based on their recommendations some questions were need deleted or modified. Second, measures are factor analyzed using approach of principal component analysis and varimax rotation (see table2 &3) to check for the dimensionality of the scales measuring social influences and investment decision. Third, measures are assessed for reliability using Cronbach's Alpha to check for their internal consistency and are assessed on a five point Likert scale.

#### 3.2. Measures

Table 1: Measured used by the present studies

Dimensions	Source	Items	Scale
Herding	Bikhchandani & Sharma, (2000)	Other investors' decision of buying and selling stock has impact on my investment decisions.	Likert
		Other investors' decision of the stock volume has impact on my investment decisions.	Likert
	Nofsinger & Sias, (1999)	I follow decisions of my friends/ family/colleagues for my investment decisions.	Likert
		I follow a particular group or community for my investment decision.	Likert
Informational	Loretan and	I think people's information is important then the information I have.	Likert

cascaded	English (2000) Forbes and Rigobon (2002) anBoyer et. al. (2006)	I always change my investment decisions as per people's information.	Likert
		I always use my own information to make investment decisions.	Likert
Contagion	Boyer et al. (2006)	The economic and financial condition of other country is important for making investment decisions.	Likert
		International crisis impact the performance of local stock market	Likert
		When the stock market of other countries crashes then investment should be withdrawn.	Likert
Investment decision	Le Phuoc Luong & Doan Thi Thu Ha (2011)	The return rate of your stock investment meets your expectations.	Likert
		Your rate of return equals to or higher than the average return rate of market.	Likert
		You feel satisfy with your investment decision (including selling-buying, choosing stock and deciding the volume).	Likert

## 4. Analysis and findings

### 4.1. Factor analysis

13 items were used to measure the influences of social factors on individual investors' decision making. Out of which 10 items were related to social influences and 3 items were related to investment decision. To define the underlying dimensions in the original variables factor analysis had been applied using principal component analysis and varimax rotation to extract the constructs. Ten items dealing with social influences were able to extract 3 factors which were named as contagion, herding and informational cascades and 3 items dealing with investment decision, could able extract 1 factor. Table 2.shows the factor extracted and their corresponding variables for social influences. The Kaiser-Meyer Olkin Measure of Sampling Adequacy (KMO) presents the level of suitability for the collected data. The KMO should be between 0.5 and 1.0 (significant level less than 0.005) to make sure that factor analysis is suitable for the data (Ali, Zairi & Mahat, 2006, p.16). In our case KMO for the factors of social influences is 0.860 ( see Table 2) Total

variance explained is used to identify the number of retained factors in which factors can be retained until the last factor represents a small proportion of the explained variance. The total variance explained was 80.786 in our analysis which suggested being more than 50% (Hair et al., 1998, p.111). Eigenvalue is an attribute of factors, being defined as the amount of variance in all items (variables) explained by a given factor. Eigen-value should be greater than 1 because Eigen-value is less than 1 means that information explained by the factor is less than by a single item (Leech, Barrett & Morgan, 2005, p.82). Eigenvalue for three factors are 5.067 (herding), 1.774 (Informational cascades) and 1.235 (contagion) respectively. Factor loading for each variable exceeded the cut off figure of 0.4 and again Bartlett's test of Sphericity (2028.567 with 45 d.f.,  $P < .001$ ) which indicates attributes of social influences were correlated and therefore factor analysis could be performed. After qualifying all the test of factor analysis reliability test of each factor was performed. The factors had been found reliable as Cronbach's Alpha for each factor exceeded the value 0.70 (Nunnally, 1978).

**Table 2:** Factor analysis on social influences for decision making

Factors	Variables	Cronbach's Alpha	Corrected Item-Total Correlation
Herding	Other investors' decision of buying and selling stock has impact on my investment decisions.	0.906	0.886
	Other investors' decision of the stock volume has impact on my investment decisions.		0.795
	I follow decisions of my friends/ family/colleagues for my investment decisions.		0.755
	I follow a particular group or community for my investment decision.		0.719
Informational cascades	I think people's information is important then the information I have.	0.947	0.845
	I always change my investment decisions as per people's information.		0.821
	I always use my own information to make investment decisions.		0.784
Contagion	The economic and financial condition of other country is important for making investment decisions.	0.739	0.743
	International crisis impact the performance		0.723

	of local stock market		
	When the stock market of other countries crashes then investment should be withdrawn.		0.715
KMO = .860; Bartlett's test of Sphericity = 2028.567			

Table 3 shows the extraction of factor for the variables under investment decision. The factor loading for each variable also exceeded the value 0.4 and KMO shows the value 0.678 with significant value (141.557, df.3, P <.001) of Bartlett's test of

Sphericity. This table also shows the Cronbach's Alpha for the factor extracted which exceeds the value 0.70 and eigenvalue for investment decision is 1.962.

**Table 3:** Factor analysis of variables for investment decision

Factor	Variables	Cronbach's Alpha	Corrected Item-Total Correlation
Investment decision	The return rate of your stock investment meets your expectations.	0.735	0.837
	Your rate of return equals to or higher than the average return rate of market.		0.804
	You feel satisfy with your investment decision (including selling-buying, choosing stock and deciding the volume).		0.735
KMO = .678; Bartlett's test of Sphericity = 141.557			

**4.2. Social influences and investment decision**

The relationship between social influences and investment decision making has been examined in this study and result shown in table 4. Two tailed Pearson correlation coefficient (r) is performed for this purpose and a highly positive relationship (r =.865) is found between contagion and investment decision making of individual investors. Hence hypothesis H3 is rejected. This result also supports the finding of Davis (2008) who proposed that during a market crisis, the media can push trading activity to extremes and can trigger positive attitude towards trading. Again the influence of informational cascades shows highly positive correlation and

indicates a strong relationship (r = .841) Hence hypothesis H2 is rejected and indicates that sequence of individuals ignore their private information and follow others while decision making. Finally influence of herding shows highly positive correlation and indicates a strong relationship (r = .743) between decision made by the peer groups or any community and individuals' decision, hence hypothesis H1 is also rejected. This is because, social interactions partly induce trading and a highly 'social' investor finds the market more attractive when more of his peers participate (Hong, Kurbik, and Stein, 2004) in trading.

**Table 4:** Relationship between social influences and investment decision

SL NO.	Social influences	Attitude towards training	
		Pearson Correlation Coefficient 'r'	Sig. (2-tailed)
1	Contagion	.856**	.000
2	Informational Cascades	.841**	.000
3	Herding	.743**	.000

\*\* Correlation is significant at the 0.01 level (2-tailed).

**4.3. Social influences and investment decision: regression analysis**

Correlation analysis established strong positive correlation between social influences and individual investors' decision making. However it is further required to measure the extent of relationship between the variables. For this purpose multiple regression analysis have been performed the factors of social influences such as herding, informational cascades and informational contagion are taken as independent variables and investment decision as dependent variable. Table 5 shows the R-square value equals to .877 which shows the 87.7% proportion of dependent variable (investment

decision) has been explained by independent variables which is very high and shows a very strong association. Adjusted R-square shows the value equal to .875 which indicates that any time another independent variable is added to this model, the R<sup>2</sup> would change marginally. Among the social influences contagion and informational cascades are found to have major factor to impact the decision making of individual investors. Herding comes on third amongst three but also shows major determinants of decision making. The ANNOVA test shows the result of regression model. In this result the value of F-ratio is 513.853 (P < 0.05) which specifies the model is a good fit.

## 5. Discussion

Stock market indexes are replica of social mood, for a trivial event it reacts to a large extent then suddenly come down to its normal state again the stock market decisions are completed quickly, the stock market itself is a measure of social mood. Lo (2002 p. 81) argues, "Physics may not be the right metaphor for economics systems." The economy is

not a physical system. It is a system of human interactions. While fundamentals are important, it is the individuals' mental state for those fundamentals, influence by social interactions, which drive their action. This paper attempt to analyze these social interactions as a proxy for herding, informational cascades and contagion on individual investors' decision making.

**Table 5:** Social influences and investment decision: Regression analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.279	.090		3.088	.002		
Contagion	.444	.030	.500	14.706	.000	.491	2.035
Informational cascades	.284	.030	.360	9.426	.000	.390	2.565
Herding	.178	.032	.190	5.540	.000	.483	2.069

Adj. R-squire = .875  
Sig at 5% level = .000

R-squire = .877  
F value = 512.853

Analyzing the factor analysis it can be observed that following others action for buying and selling the stocks (factor loading =.886) and volume for the particular stocks (factor loading =.795) are more important while investors herd. For informational cascades importance of others information (factor loading =.845) and changing investment decision based on others information (factor loading =.821) are important criteria. Finally contagion impact their investment on the basis of economic and financial performance (factor loading =.743) is most important.

The result of regression analysis shows contagion as a major factor that drives the individuals' action for decision making. Contagion is a state when individuals emotionally attached to international information related to economic crisis. The reason may be use of internet and advanced media which viral the information very quickly and impact decision making this effect is otherwise called "domino effect". The empirical finding of this domino pattern shows that in times of financial distress panic indeed spreads contagiously, as described in Dornbusch et al. (2000). Our study also support the finding of Boyer et al. (2006) which investigates the spread of crises through asset holdings of international investors, and find that this is additional channel through which crises can spread. Informational cascades show the second most influencing factor of investment decision in the result. An information cascade occurs when individuals, having observed the actions and possibly payoffs of those ahead of them, take the same action regardless of their own information signals. Herding comes third as an influencing factor but even a strong factor with 5.540 t values and .190 as beta coefficient. Herding and informational cascades used interchangeably but best on the rationality they are different from each other. Smith and Sorensen (2000) emphasize that there is a significant difference between them. An

informational cascade is said to occur when an infinite sequence of individuals ignore their private information when making a decision, whereas herd behavior occurs when an infinite sequence of individuals make an identical decision, not necessarily ignoring their private information. Both the biases occur when investors follow others for minimizing risk and quick decision. The Indian investors are mostly affected by these psychological biases as they are risk averse. Our result supports the findings of Lao & Singh (2011) who examined herding patterns in Indian and Chinese stock markets. They found that herding behavior is greater during extreme market conditions in both markets but the pattern is different. In India herding is greater when market is up (bull phase).

## 6. Conclusion

Using the primary data collected from the individual investors of Jharkhand, Bihar, Orissa and west Bengal this study explores the three significant findings. Firstly individual investors are mostly susceptible to global and national news during economic crisis. Secondly they ignore their private information and follow others for their decision making; finally peer groups like friends, family and colleague have a great impact on decision making of individual investors. It shows their inclination for quick decision making and risk aversion. The social biases such as herding, informational cascades and contagion, as a proxy of social influences, impact positively the investment decision making of individual investors and also support the findings of Lao & Singh (2011), Davis (2008) and Hong, Kurbik, and Stein (2004).

Contagion and informational cascades are found to be the major factors while herding comes in third yet significant influencing factors for stock market participation. After analyzing the result of this study we can conclude that investors are mostly affected

by societal settings, they participate into the market considering stock volume and selling- buying of stocks by their peer groups, they ignore their private information and most prominently they are more contagion to the crisis news from the global as well as home economy. Findings of this study also reject the well-established hypothesis of market efficiency and rationality of stock market participants.

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