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CONTENTS

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   INTRODUCTION

   REVIEW OF LITERATURE

   NEED/IMPORTANCE OF THE STUDY

   STATEMENT OF THE PROBLEM

   OBJECTIVES

   HYPOTHESES

   RESEARCH METHODOLOGY

   RESULTS & DISCUSSION

   FINDINGS

   RECOMMENDATIONS/SUGGESTIONS

   CONCLUSIONS

   SCOPE FOR FURTHER RESEARCH

   ACKNOWLEDGMENTS

   REFERENCES

   APPENDIX/ANNEXURE

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CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

THE EFFECT OF OPEN INTEREST CHANGE IN THE FIRST 20 MINUTES ON INTRADAY INDEX MOVEMENT: AN EMPIRICAL STUDY BASED ON NSE NIFTY OPTION

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ABSTRACT

This study extends the Bhuyan and yan (2002) findings to intraday level. It tries to investigate the role of stealth trades in the index option market. It also tries to find whether open interest change in the first 20 minutes, from the previous close, in index option (both call & put ATM options & just OTM options) provide information about intraday price movement? If so can this information be based to generate trading gains? Does the information constitute an additional means for the stealth traders? The objective of the study is to firstly test percentage change in open interest in the first 20 minutes of trade, from the previous close, shows the direction of the market intraday or not? & secondly to analyze if the stealth trader participate in the trading in index based option in the morning hours? It is observed that the change in open interest does help find the direction of the market intraday. It is also found that there is a sense of co-optetion among the stealth traders that is the cooperation with competition. When information is asymmetrical they take competitive position and when the information is symmetrical they take cooperative position. It has also been observed that stealth trader participate in the market in the morning hours as option writers rather than option buyers.

KEYWORDS
ATM Option, co-optetion, OTM Option.

ABBREVIATIONS
ATM Option, OTM Option, Co-optetive Model, Just OTM Option.

INTRODUCTION

An option is one of the important instruments traded in the derivative exchanges all over the world. It is well known that trading in option(Black, 1975) may be more attractive than trading in underlying equity market due to economic incentives provided by reducing transaction cost, capital requirement and trading restrictions, commonly seeing in equity market.

Bhuyan and Chaudhury (2001) have examined the role of option market's open interest in conveying information about the future movement of the underlying asset and have shown that the trading strategies based on this predictor yields better results as compared to the buy-and-hold and passive covered call strategies. Further, Bhuyan and Yan (2002) have developed several price predictors from the open interests and volumes of individual stocks from the option market and conclude that they exhibit significant explanatory and predictive power for the future stock prices. Their results have been the driving force for the present study which is among one of the earlier attempts to study the role of option market in determining the underlying share prices in Indian context.

This study extends the Bhuyan and Yan (2002) findings to intraday level. It tries to investigate the role of stealth trades in the index option market. It also tries to find whether open interest change in the first 20 minutes, from the previous close, in index option (both call & put ATM options & just OTM options) provide information about intraday price movement? If so can this information be based to generate trading gains? Does the information constitute an additional means for the stealth traders? The objective of the study is to firstly test percentage change in open interest in the first 20 minutes of trade, from the previous close, shows the direction of the market intraday or not? & secondly to analyze if the stealth trader participate in the trading in index based option in the morning hours? It is observed that the change in open interest does help find the direction of the market intraday.

It is also found that there is a sense of co-optetion among the stealth traders that is the cooperation with competition. When information is asymmetrical they take competitive position and when the information is symmetrical they take cooperative position. It has also been observed that stealth trader participate in the market in the morning hours as option writers rather than option buyers.

REVIEW OF LITERATURE

Theoretical models about the behaviors of the informed traders suggest that they spread overtime to maximize their profit from the private information Kyle (1985). ***Ecom & Hahn (2005)*** also found the same.***Glosten & Milgrom (1985)*** found that two kind of trader trade with the market maker: uninformed trader & informed trader who have the superior information on the asset, they sell when there is bad news and buy when the news is good. ***Admati & Pfleiderer (1988)*** found that the informed traders inter the market when the liquidity is high (during the opening session).

Granger (1989) asserted that informed trader trades in call & put option based on their private information which conveys information to other market participants resulting in positive or negative impact on the price of underlying asset. ***Barclay & Warner (1993)*** proposed stealth trading hypothesis to find the behavior of the informed trader. They suggested that the informed trader use several medium sized trades to avoid detection. The medium sized trades should not be too small because the small sized trades delay the acquisition of the desired position and increase the likelihood that the information can be revealed large trade is not done because if the trade is not broken it will probably attract attention. Informed traders also trades in option market can be traced from academic literature of Mayhew, Sarin & Shastri (1995). ***Hara & Srinivas (1998) Koedijk, Schnitzlein (2001)*** suggest that informed traders may favour ITM option. ***Bhuyan & Chowdhary (2001)*** have investigated the role of open interest from option market in discovering the future price movement in underlying cash market. They suggested that open interest based predictor gives better result than buy & hold strategy. ***Kaul, Nimalendran & Zhang (2002)*** find that ATM & slightly OTM options spreads are most sensitive to adverse selection measures in the stock.

Bhuyan & Yan (2002) used open interest and volume based predictors to empirically investigate the hypothesis that the non price variables viz. open interest and volume in option market can be used to predict the future price index in underlying cash market. ***Srivastava (2003)*** find that open interest and volume based predictors have significant explanatory power with open interest being more significant as compared to trading volume. ***K.N. Mukherjee and R. K. Mishra***

(2004) find that open interest based predictors are significant in predicting the underlying spot price index. ***Ecom & Hahn (2005)*** supported the view that the traders who have information use small sized trades rather than large sized trades.
Cao, Chen & Griffin (2003) fin Barcley & Warner by using the data from NYSE stocks from 1981-1984 found supporting evidence of the stealth trading hypothesis ***Anand & Chakravarty (2001)*** find the same result while using the data from Nov 1090 to Jan 1991 NYSE TORQ dataset. They also find that institution rather than individuals are the source for the disproportionately large cumulative price change of medium sized trades which implies institutional investors are indeed informed. They examined stealth trading in option market. They demonstrated that the strategic fragmentation of trades by informed traders depends on the liquidity of the option market. Especially for liquid (illiquid) contracts informed traders use medium sized (small sized) contracts. ***Anand & Chakravarty*** employed the information share method of ***Hasbrouck (1995)*** to compute how much each trade size category contribute to the total price changed indirect evidence of informed trading.

OBJECTIVES OF THE STUDY

1. Do the open interest change in the first 15 minutes from the previous close in index option (both call & put ATM options & just OTM options) provide information about intraday price movement? If so can this information be based to generate trading gains?
2. Does the information constitute an additional means for the stealth traders?
3. To test percentage change in open interest in the first 20 minutes of trade, from the previous close, shows the direction of the market intraday or not & also to analyze if the stealth trader participate in the trading in index based option in the morning hours.

DATA & METHODOLOGY

From the previous studies conducted by the academician we can understand that the informed traders trade in the option market Sarin & Shastri (1995), Hara & Srinivas (1998), Pan & Potesman (2003), Cao, Chen & Griffin (2003) they normally operate overtime but they also operate in the opening session when the liquidity is high Admati & Pfleiderer (1988), since the nifty ATM & just OTM options are the most liquid options in India they operate in the medium sized trades as suggested by Anand & Chakravarty (2001), Admati & Pfleiderer (1988) find that informed investor submit both market & limit order.
The data for this study is taken from the website (www.nseindia.com, the official website of National Stock Exchange of India). In this paper the first 20 minutes data is considered. Everyday the data at 9.20 AM for the change in open interest in ATM & just OTM call & put option has been observed in order to find the relationship between the change in open interest and the index closing value. The data for the period of three months has been observed then it is compiled & compared to find out if the data pertaining to change in open interest in the first 20 minutes of opening of the market have any bearing to the direction of the market. Is there is any stealth trading in the market? The data has been observed on weekly basis in April through June series. Then according to the observation the data has further been divided into two parts.
1) The first three weeks of the new series 48 days in total has been observed
2) The four days of the expiry week. 12 days in total has been observed
3) This study is based on non participant observation of the data and ample care has been taken to be as objective as possible

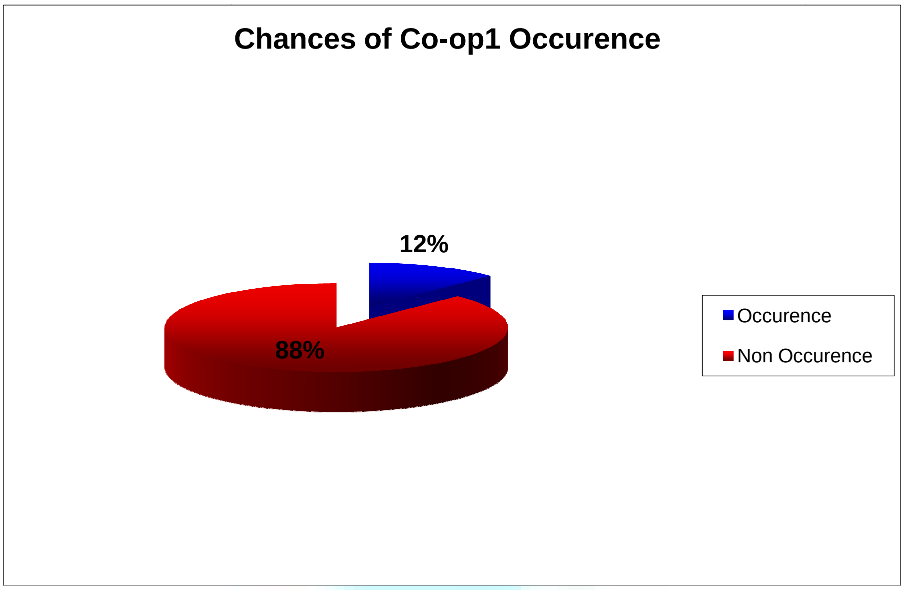
CO-OPTETION &THE TRADING STRATEGIES IN THE FIRST THREE WEEKS OF THE SERIES

For us co-optetion means co-operation with competition. In the option market or share market as a whole if anybody is taking cooperative position he is simultaneously taking competitive position with other. In this paper, we focus on directional trading strategies for a learner investor.
We find that the open interest based predictor has good accuracy, we also found that the open interest based active trading strategies generate better return compared to passive buy and hold strategy .The magnitude of the return is too high to be nullified. Our empirical evidence suggest that the index option open interest contain information about the intraday index movement

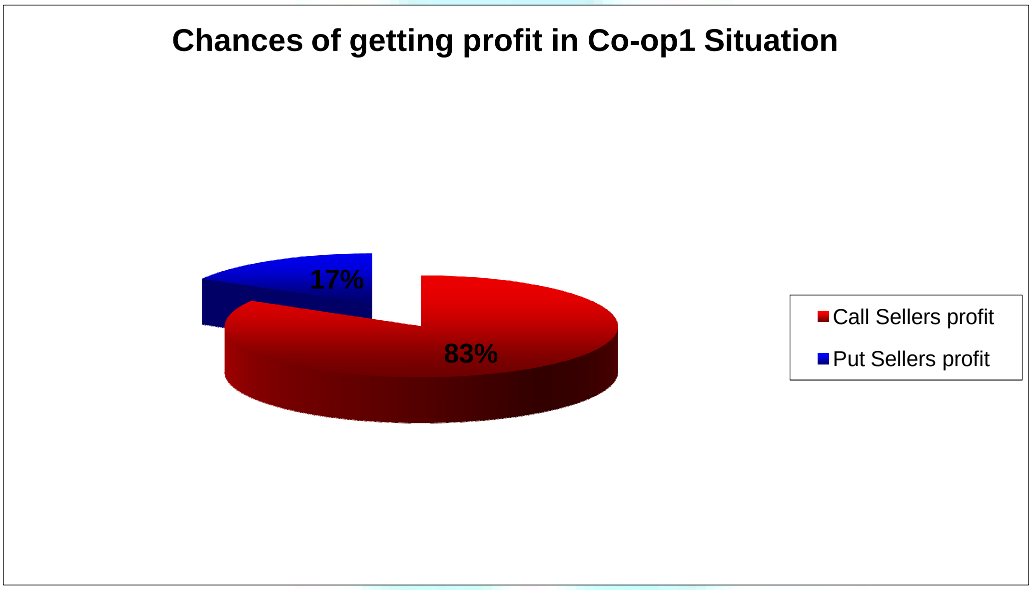
FOUR TRADING SITUATIONS OF CO-OPTETION

Taking co-optetion as a major factor we have taken four following cases:
co-op model-1: When the call ATM & Just OTM option percentage change in open interest is in positive ,from the previous close, & put ATM & Just OTM option open interest is in negative change, from the previous close, in the first 20 minutes of the trading day.
co-op model-2: When the call ATM & Just OTM option percentage change in open interest is in negative, from the previous close, & put ATM & Just OTM option open interest is in positive change, from the previous close, in the first 20 minutes of the trading day.
co-op model-3: When both the call and put ATM & Just OTM option percentage change in open interest is in positive, from the previous close, in first 20 minutes of trade
co-op model-4: When both the call and put ATM & Just OTM option percentage change in open interest is in negative, from the previous close, in first 20 minutes of trade
co-op model-1: (predictable) When both the call and put ATM & Just OTM option percentage change in open interest is in negative, from the previous close, in first 20 minutes of trade.
co-op1 for us is predictable when the just OTM and ATM call options open interest is in positive change from the previous close and put option ATM and just OTM options open interest is in negative change from the previous close then the index shows negative change by the end of the closing session from the level at which the index was at 9.20.AM.
In our observation this kind of situation arrive in 6 trading session out of 48 trading session observed, that comes to12.5% (pie chart 1) of the total trading session observed and out of the 6 trading sessions 5 days the index went down southward or showing negative divergence from the position it was at 9.20 AM that comes to 83.33% time the call sellers were in profit and only 16.66% time put sellers were in profit (pie chart 2) and it was also observed that on 5 occasion index went up at least 10 points higher, from the 9.20AM value, before going down that comes to 83.33% times that the index went up at least 10 points from the level it was at 9.20AM(pie chart 3). It gives importance that stealth traders participate in the market in the morning hours
It gives emphasis to the point that there is some informational symmetry among the major market participants. It also emphasizes that the major market participants are option sellers rather than option buyers in the morning session and it has also been observed that market goes in the desired direction because of the co-operative position in the option market by the large players.
It has also been observed that small to medium sized order is placed by the market participants not to get caught or by the time they are caught. They are already in the winning position.
Following pie charts indicate the index movement in co-op1. (Predictable) situation
1 chances of occurring co-op 1 situation
2 chances of getting profit to call sellers in co-op 1 situation
3 chances of index going up at least 10 points from 9.20 AM in co-op1 situation

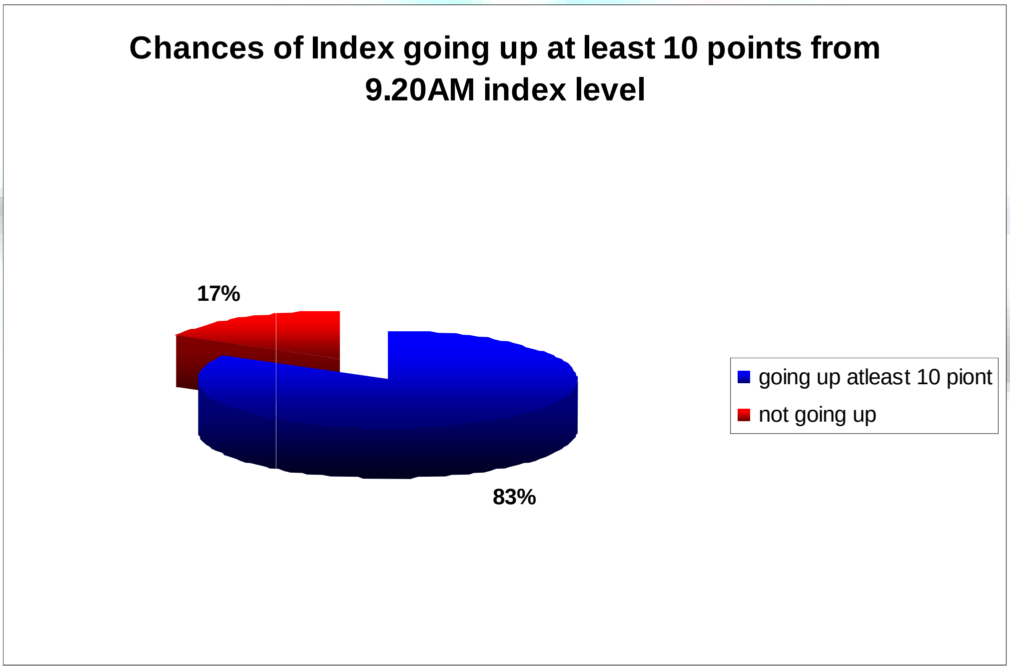
PIE CHART: 1



PIE CHART: 2



PIE CHART: 3



co-op model-2: (predictable) when the call just OTM options and ATM options open interest is in negative change from the previous close and put ATM and just OTM options open interest is in positive change from the previous close then the index gives positive return, or go up, by the end of the closing session from the level at which the index was at 9.20.AM

In our observation this kind of situation arrive in 7 trading session out of 48 trading session observed, that comes to14.5% of the total trading session observed (pie chart 4)

In this situation opposite result was observed. The index went up in 6 out of 7 trading session that come to 85.7% times the put sellers were in profit and only 14.3% times the call sellers were in profit (pie chart 5) which again emphasized the fact that stealth traders do participate in the option market in the morning session as option sellers. It has also been observed that the index went down at least 10 point in 6 situations out of 7 observed that comes to 85.7% time that the market went down at least 10 points before going up at 9.20AM (pie char 6).

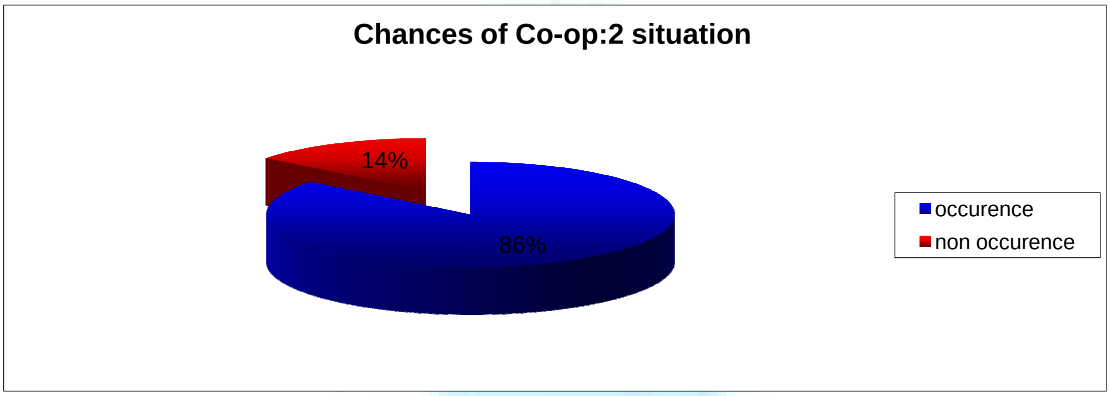
Following pie charts indicate the index movement in co-op2. (predictable) situation

1 chances of occurring co-op 2 situation

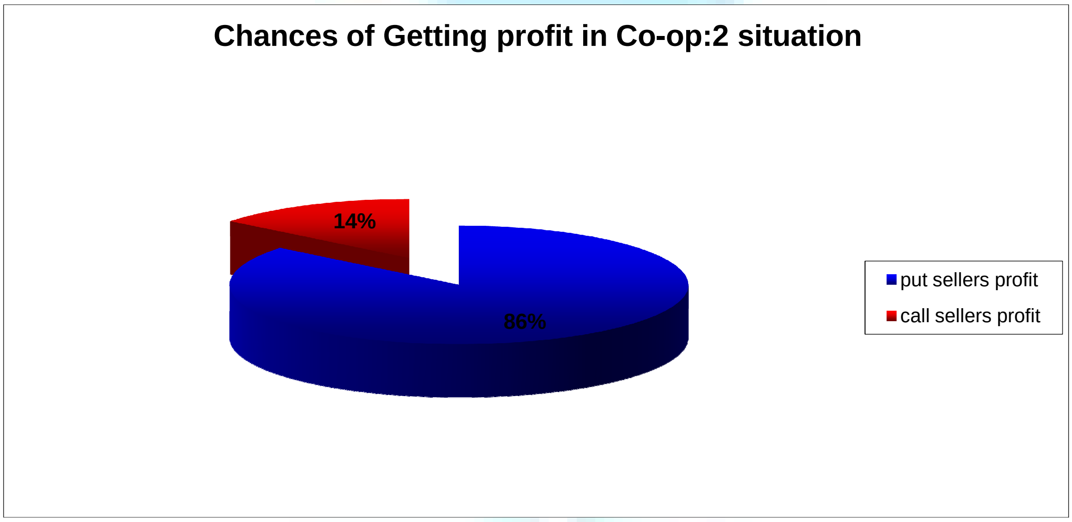
2 chances of getting profit to put sellers in co-op 2 situation

3 chances of index going down at least 10 points from 9.20 AM in co-op2 situation.

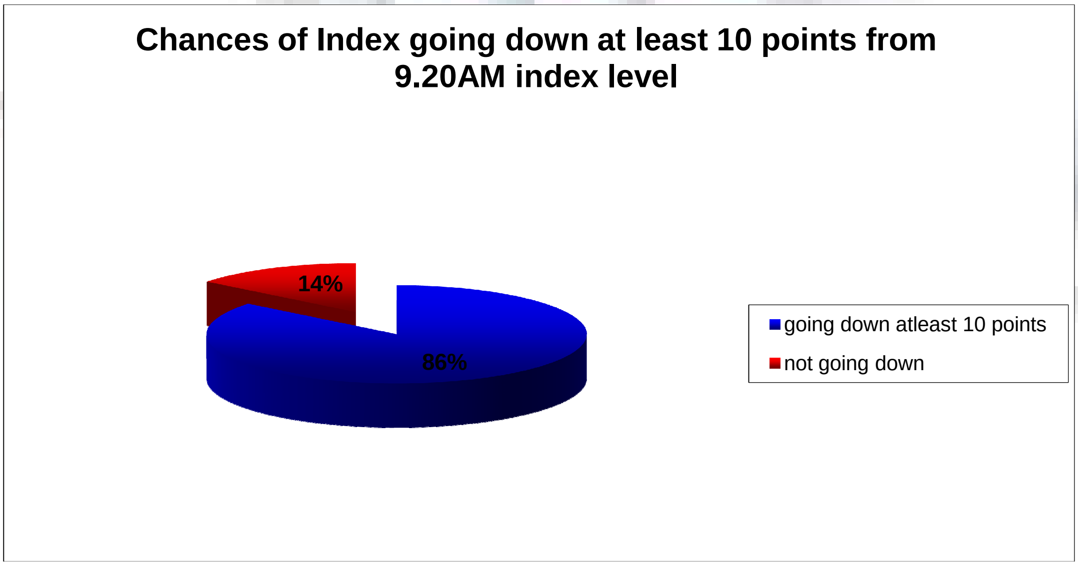
PIE CHART: 4



PIE CHART: 5



PIE CHART: 6



co-op model-3: (unpredictable)When both the call and put ATM & Just OTM option percentage change in open interest is in positive, from the previous close, in first 20 minutes of trade. This situation is the most frequent situation and it shows the informational asymmetry among the major participants in the option market in the morning hours. Out of the 48 trading days this situation occurs in 35 trading days. In these scenario three types of situations emerges:

a) When the call option open interest is more than the put option open interest. This situation occurred in 9 trading session out of 35 and the index went up 4 times from the 9.20AM situation
b) When put option open interest is more than the call option open interest. This situation occurred in 17 trading session out of 35 and the index went up 11 times from the 9.20AM situation
c) When both call option and put option open interest is almost equal. This situation occurred in 9 trading session out of 35 and the index went up 4 times from the 9.20AM situation

It has been observed that in this kind of situation the market participants look for some clues to make the position symmetrical during the days trading session.

co-op model-4:(unpredictable) When both the call and put ATM & Just OTM option percentage change in open interest is in negative, from the previous close, in first 20 minutes of trade. In my study of the open interest in 60 trading session this situation never occurred.

CO-OPTETION & THE TRADING STRATEGIES IN THE EXPIRY WEEKS OF THE SERIES

It has been observed that in the expiry week starting from Monday to Thursday out of the 12 trading days that the data has been observed 7 days the call option open interest is more than the put option open interest and the market went up 5 days from the 9.20 situation the rest of the 5 days when the put option open interest is more the market went down on 3 occasions

It can be claimed that in the expiry week the major players becomes option buyers rather than option sellers but again it can also be claimed that this kind of situation is quite tricky and comes under unpredictable category.

EMPIRICAL FINDING

Intraday variation in spread can be explained through inventory & asymmetrical information based model foresee that the liquidity provider (either market maker or limit order) widens the spread in presence of adverse selection risk

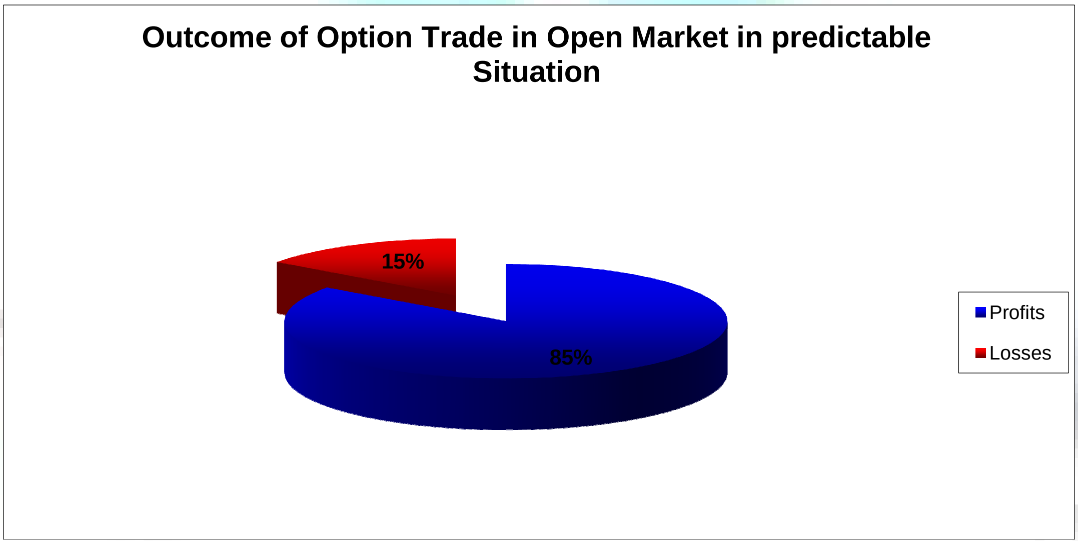
Information asymmetry is assumed strongest when the marker opens, as the overnight information is not incorporated into prices McInish & Wood (1992) find that adverse selection risk is highest in the beginning of the trading day and as the information is gradually incorporated it decreases until the end of the day. Swartz identifies four determinants of spread activity, risk, information & competition. It is found from the empirical data that in the morning session there is a sense of co-optetion among the informed investor. Co-optetion meaning competition with co-operation. It is found that if the information is symmetrical among the institutions then they take cooperative position for trade gains and when the information is asymmetric then they take different position in the opening period thereby and gradually looks for other clues to make it symmetrical for the trade gains in option market.

It is also found that when there is symmetrical information among the institutional investor the percentage change in open interest in ATM & just OTM call (put) options is positive and the percentage change in open interest in put (call) option is negative. It gives the idea of co-operation among the institutional investors. When they take opposite position the percentage change in open interest from the previous close in both call & put option is positive or negative and as the day progresses other clues are discovered to find the direction of the trade whether positive or negative. As discussed by the academicians the Stealth traders do take part in the option market Mayhew, Sarin & Shastri (1995), Hara & Srinivas (1998), Pan & Potesman (2003), in the beginning of the session Admati & Pfleiderer (1988) with both market & limit order Admati & Pfleiderer (1988) Anand & Chakravarty (2001).and they are generally institutional investors Anand & Chakravarty (2001).

It is found from the data observed that there is some change in the open interest in both call & put option of nifty index option in the opening session when there is positive change in call (put) option and corresponding negative change in put (call) option then it can be assumed that stealth trading activity is present as there is some symmetrical information among the institution and there is some sense of indirect cooperation. It is also observed that when there is cooperation whether direct or indirect the market generally closes in the desired level, .It is also observed that in the day the economic data is to be released the position taken in the first fifteen minutes are in the co-operative one that is call (put) option open interest showing positive change& put (call) option witness negative change in open interest.

It has been observed that if the retail traders participate in the option market in the two predictable situations only then they have 85% chance of having trading gains and getting huge profit and 15% chance of loosing money (pie chart 7).

PIE CHART: 7



CONCLUSION & DIRECTION FOR FURTHER STUDY

The data has been observed for three months, only Bhuyan & Yan (2002) argued that the informed trader buy OTM call option when they expect market to rise and OTM put option when the expect the market to decline but intraday finding suggest that they sell ATM & just OTM call option when thy expect the market to decline & sell ATM and just OTM put option when they expect the market to rise except in the expiry week in which open interest seems to be not the most important predictor of the market. It can be easily understood that option open interest is a very good predictor of information symmetry or asymmetry.

It has been observed that if the percentage change in volatility is high then there is more chance of getting the co-op 1 & co-op 2 kind of situation and when the volatility is low then there is more chance of getting co-op 3 kind of a situation.

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