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IMPACT OF MONSOON ON INDIAN EQUITY MARKET

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ABSTRACT

Seasonal variation and calendar anomalies are known phenomena in equity markets worldwide. Many researchers have studied day-of-the-month, day-of-the-week, month-of-the-year, tax loss hypothesis and SAD cycle in equity markets across countries. There have been many evidences of calendar anomalies in Indian equity market. India being an agriculture driven developing nation, is heavily dependent on monsoon for economic growth. Equity market being lead indicator of economy should be influenced by monsoon in India. This paper attempts to understand the impact of monsoon on Indian equity market. We have used OLS Regression and Logit Regression Models to study the monsoon effect on Indian equity market return. We found presence of month-of-the-year anomaly in the study. We also found monsoon period return to be statistically significant and positive bias during monsoon months in Indian equity market indices Sensex.

INTRODUCTION

Seasonal fluctuations in production and sales are a well-known fact in business. Seasonality refers to usual and recurring variation in a time series which occurs occasionally over a span of less than a year. The main origin of seasonal fluctuations in time series data is the alteration in climate for businesses. The example is here can be the sale of refrigerators during hot summer and the demand for umbrellas during monsoons. Even traditions can have economic impact as the example here can be gold sales during marriage season. Similarly, stock markets exhibit methodical patterns at certain times of a month, week and day. The existence of seasonality in stock returns however violates the very basics of efficient market hypotheses. The efficient market hypotheses relate to how swiftly and precisely the market reacts to new information. New data are continuously entering the market place via economic reports, company announcements, political statements, or public surveys. If the market is information efficient then security prices adjust rapidly and accurately to new information. According to this hypothesis, security prices reflect fully all the information that is available in the market. Since all the information is already incorporated in prices, a trader is not able to make any excess returns. Thus, Efficient Market Hypothesis proposes that it is not possible to outperform the market through market timing or stock selection.

Efficient Market Hypothesis (EMH) proves that all securities are priced efficiently to completely discount and revel all the information about the intrinsic value of the stocks. An efficient market is the one where all unexploited yield is eliminated by arbitrage. However, in case of financial markets, especially in the case of equities returns, several seasonality related Effects, that create higher or lower yield depending on the time, have been recorded. They are called Anomalies as they cannot be explained by much accepted traditional models of asset pricing. The examples of such anomalies include the Day-of-the-Week Effect, January Effect, the month-of-the-year Effect, the Week of the Month Effects and the Holiday-Effect. This gives investors an opportunity to develop trading strategies that help them to earn higher abnormal yields on the basis of such seasonal patterns. For example, an investor may be ready to sell stocks on Fridays and ready to purchase them on Mondays with view to take benefit of the day-of-the-week effect. There is vast literature on the effects of such anomalies on security markets across the world. Hess P, Gibbons MR,(1981)[1] found that stock yields on US security markets were found to be significantly low on Mondays and high on Fridays.

Market Efficiency

The stock market is probably the most-watched financial market, with its trading activity and indices a part of newscasts

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every day. Stock Market Efficiency is a concept of importance because it helps us to understand the functioning of the Stock Markets. The words, Market Efficiency describe the Relationship between Knowledge, Information and Stock Prices in the Stock Market. The efficiency in the developing stock markets assumes importance as the importance of investments is increasing in these markets as a result of reforms in regulations and removal of other laws and entry barriers for the International Equity Investments. Market Efficiency influences the Investment Strategy of an investor as in a market that is efficient, there would be no security that is undervalued or overvalued. This implies that the securities will not yield returns higher or lesser than the right expected returns, considering their risk parameters. On the other hand, if the stock market is not efficient, excess (higher) yield can be earned by rightly picking up the securities.

Efficient Market Hypothesis (EMH)

The term "Efficient Market" is used to explain the market prices that completely reflect all the available information. An Efficient Market is distinct as a market where there are a huge number of cogent, yield maximizing agents, actively competing with each other, attempting to predict future market prices of individual stocks being traded in the market and wherever significant current information is nearly freely available to all participants **(Ross et al. 2005)**[2]. An Efficient Capital Market is the one, in which the market price of a security is a balanced estimation of its intrinsic value. Here it should be noted that Market Efficiency does not describe us that the market price reflects the intrinsic value at every given point in time. All it explains is that the mispricing errors in the market are impartial. This explains that the price can diverge from the intrinsic value but the divergence is random and is not correlated with any visible or obvious variables. If the deviation of market prices from the intrinsic value is random, it is not achievable to again and again identify and discover over or under-valued securities.

Market Efficiency Anomalies

Parallel to the development of Efficient Market Hypothesis, few contradicting researches of market efficiency and anomalies are also recorded. The Market Efficiency Anomalies could be defined as a fact, which is continual, that counters the hypothesis of market efficiency. Ever since 1970, after the announcement of Fama's Efficient Market Hypothesis, the contradictory studies have been performing against constantly. In the real world situations, there are evidences of market participants outperforming the market by means of some investment strategies. For example, the famous investor Mr. Warren Buffett has concentrated on the undervalued stock investment strategy to create millions dollars of profits and some of the portfolio Managers have demonstrated their ability in identifying above average portfolio than the average market investors. The above explained facts have occurred indeed in actual life, but they have to be look at some academic frameworks methodically, in view to better understand the market efficiency anomalies. Till the late seventies, empirical studies provided ample evidence as to the informational efficiency of the capital markets advocating futility of information in consistently generating abnormal returns. However, later studies identified certain anomalies in the efficient market postulate. One major a nomaly brought forth was the calendar-related abnormal rates of return. Various studies in this domain empirically demonstrated, through parametric and non-parametric tests on the stock returns data, that turn of the year, month, week, and holidays have consistently generated abnormal equity returns in both the developed and emerging markets unrelated to the attendant risks. Studies on the Indian stock markets' calendar anomalies, especially in the post-reform era, are very few.

Seasonality Effect

The Seasonality Effect is better known as the Calendar Effect. The Seasonality Effect includes a number of patterns dealing with the issue of time and it is one of the main patterns of the securities market efficiency anomalies. The Seasonality patterns in stock yields are a subject that can be closely related to Weak-Form-of Market-Efficiency. When Weak-Form-Efficiency is studied, the applicable information detail is limited to previous stock prices. But the seasonal patterns in stock yields, as a relentless phenomenon, implies that the investors have diverse rates of returns necessary on risky assets, relying on which Month of the Calendar, a month based investment is made. Investors can try to specify an assured period of time and calendar or a set of time, to test the particular phenomenon about the stock yields and then notice if any rules one can be followed or any speculation opportunity can be created. Calendar Effects include: January Effect, the Day of the Week Effect, the Month of the Year Effect, Semi-Month Effect, Holiday Effect, Monday Effect, Weekend Effect, and Turn of the Year Effect etc.

India, predominantly an agriculture-based economy, is largely dependent on the monsoon. The agriculture sector is the backbone of the Indian economy and thus, monsoon should be considered as the backbone of agriculture. The four-month (June-September) South-West monsoon season, accounts for nearly 75 per cent of the country's total rainfall and plays a crucial role as about 55-60 per cent of the area sown is still rain-fed. In recent years India has leaped forward in the direction of becoming an industrialized nation but still monsoon has huge economic impact on the economy. Deficit in rainfall can result in higher inflation and that could trigger pressure on the growth of the economy. If such is the impact of monsoon on Indian economy, the Indian stock market must have some impact of monsoon as good monsoon would predominantly mean that the economy will do well and businesses will stand benefitted. This paper attempts to study the impact of monsoon on Indian stock market.

REVIEW OF LITERATURE

Kelly **(1930)** in his research paper entitled, "Why You Win or Lose: The Psychology of Speculation", utilized three years closing value data of the US securities market to investigate the day of week effect, the day of the week effect has been investigated extensively in various stock markets. The day of week effect investigates whether the returns of all days of week are same of not. If the returns of all days of a week are not the same statistically it means that the Day of the week effect is present. Kelly found Monday to be the worst day to purchase stocks.[3]

Watchel (1942) in his study titled, "Certain Observation on Seasonal Movement in Stock Prices", recorded the presence of seasonal patterns in stock yield for the first time in form of scholarly research article. The paper attempted to formulate an explanation for disproportionately large January returns based on year-end tax loss selling of shares that have declined in value over the previous year. Since size is measured here as total market value of equity, the smallest firm portfolios are biased toward inclusion of shares that have experienced large price declines and, therefore, are likely candidates for tax loss selling. The possible association between tax loss selling and the January effect merits consideration. The theoretical value of the tax loss selling hypothesis diminishes, however, with the existence of arbitrage possibilities in non-segmented markets with non-taxable investors. In addition, the hypothesis is not clearly supported empirically. If the January effect is the result of year-end tax loss selling, then the magnitude and significance of the measured January effect should, ceteris paribus, vary with the level of personal income tax rates. For example, the January effect should be less significant in pre-World War II years when personal tax rates were relatively low. [4]

Cross (1973) in his research paper titled, "The Behavior of Stock Prices on Fridays and Mondays", recommended that the average yield of the S&P 500 for the period starting from1953 to 1970 on Fridays to be on the higher than average yield of Monday. Cross(1973) pointed out that stock prices tend to decline over weekends in the three-day interval from Friday's close to Monday's close.[5]

Rozeff and Kinney (1976) in their research article titled, "Capital Market Seasonality: The Case of Stock Market Returns", found that the January anomaly in New York Exchange securities for the period starting from 1904 to 1974. They recorded that average yield for the month of January was on the higher side than other months of a year in terms of stock yield.[6]

Keim(1983) in his research paper entitled *,"Size-Related Anomalies and Stock Return Seasonality: Further Empirical Evidence",* besides seasonal patterns also studied the size effects in stock yields. He found that yield of small market capitalization firms were significantly higher than large capitalization firms in the month of January and attributed this finding to tax-loss-selling and information hypothesis.[7]

A analogous finding to Keim (1983) was established by Reinganum (1983), in his research paper titled "The Anomalous Stock Market Behavior of Small Firms in January Empirical Test for Year-End Tax Effect", he recorded that the whole seasonality patterns in stock yield cannot be explained by only tax-loss-selling hypothesis.[8]

Gultekin and Gultekin(1983) in their research study titled "Stock Market Seasonality: International Evidence", studied the occurrence of stock market seasonality patterns in sixteen industrialized countries. The findings suggested strong seasonal patterns in the capital markets caused by January yield, which was very statistically significant in fifteen of sixteen industrialized countries.[9]

Ariel (1987) in his research paper titled, *"A Monthly Effect in Stock Returns",* studied the US capital market indices from the year 1963 to 1981 to understand the half-month pattern, his research established that the average stock yield in the first half of a month were found to be relatively higher than second .[10] Ariel(1990)in his research paper titled, "High Stock Returns before Holidays: Existence and Evidence on Possible Causes", discovered that in the US stock markets more than one-third positive yield every year was registered in the 8 trading sessions before long market holidays.[11]

Ziemba (1991) in his research study entitled, "Japanese Security Market Regularitie: Monthly, Turn of the Month and Year, Holiday and Golden Week Effects", recorded that average yield was consistently on the higher side on the first and last four days of a month in Japanese Stock Market.[12]

Cadsby and Ratner (1992) in their research article named, "Turn-of-Month and Pre-holiday Effects on Stock Returns: Some International Evidence", recorded statistically significant pre-holiday anomaly for many of the global capital markets. But, they found such a phenomena to be absent in the European capital markets.[13]

Raj and Thurston (1994) in their research article titled, "January or April? Tests of the turn-of-the-year effect in the New Zealand stock market", recorded that the January and April anomalies were not statistically significant in the New Zealand capital market.[14]

A research article entitled, "Evidence on Weak Form Efficiency and Day of the Week Effect in the Indian Stock Market", by Sunil Poshakwale (1996), utilized daily closing values of BSE Sensex 30 starting from 2nd January 1987 to 31st October, 1994. The outcome found presence of Day of the Week anomaly in the BSE[15].

Husain (1998) in his research article, "A Seasonality in the Pakistani Equity Market: The Ramdhan Effect", recorded the presence of 'Ramadhan' anomaly in Pakistani capital market. He found significant decline in stock yield and volatility during the period of Ramdhan, though the mean return indicated no noteworthy change.[16]

Kamstra, Kramer and Levi (2003) in their article, "Winter Blues: A SAD Stock Market Cycle", investigated the role of seasonal affective disorder (SAD) in the seasonal time-variation of stock market returns.SAD is an extensively documented medical condition whereby the shortness of the days in fall and winter leads to depression for many people. Experimental research in psychology and economics indicates that depression, in turn, causes heightened risk aversion. Building on these links between the length of day, depression, and risk aversion, they provided international evidence that stock market returns vary seasonally with the length of the day, a result they called the SAD effect. Using data from numerous stock exchanges and controlling for well-known market seasonal as well as other environmental factors, stock returns were shown to be significantly related to the amount of daylight through the fall and winter. Patterns at different latitudes and in both hemispheres provide compelling evidence of a link between seasonal depression and seasonal variation in stock returns: Higher latitude markets show more pronounced SAD effects and results in the Southern Hemisphere were six months out of phase, as were the seasons. Overall, the economic magnitude of the SAD effect was found to be large.[17]

The paper entitled, "An Empirical Study on January Anomaly and Return Predictability in an Emerging Market: Evidence from India", by RengasamyElango, Dayan and Panday (2008), examined the January Anomaly and market return pattern for the five prominent indices of the NSE. The analysis revealed that March and April recorded significant negative returns and therefore, these two months are the best period to buy the scrips and November and December showed significant positive high returns, prompting us to conclude that these two months are the best period to sell the securities (sell high).[18]

Gagari Chakrabarti, Chitrakalpa Sen (2008), in their paper entitled, "November Effect: an Example of Calendar Anomaly in Indian Stock Market", investigated the Month of the Year Effect in the Indian Stock Market. This study studied the presence of Calendar Anomaly, with asymmetric market reactions, using TGARCH Model. It confirmed the presence of such Seasonal Anomaly in the form of a November Effect.[19]

The study entitled, "Calendar Effects and the Months of the Year: Evidence from the Mauritian Stock Exchange", by Ushad Subadar Agathee (2008), examined the possible Month of the Year Effect in the Stock Exchange of Mauritius (SEM). The result showed that returns were the lowest in the Month of March and highest in the Month of June. But equality of mean returns test showed that returns were statistically the same across all months.[20]

Prajapati B, Modi A and Desai J(2013), in their research paper entitled, "A Survey of Day of the Month Effect in World Stock Markets", examined presence of day of the month effect in eleven stock markets from different continents. They found day of the month effect present in all the markets tested in their study. They found that some days in a month delivered significantly higher returns than the rest. They also found turn of the month effect to be present in majority of markets studied.[21]

Desai J, Joshi N, Chokshi A and Dave A(2011), in their research titled, "A Study of Seasonality based Trading Strategy for Indian Stocks and Indices", found presence of day-of-the – month effect in Indian stock indices and stocks. They found the last week of a month and first week of the month to have significant positive bias.[22]

In their paper entitled "A Study of Day of the Month Effect in S&P CNX Nifty 50", Desai J and Trivedi A(2012) found presence of day-of-the-month-effect in Indian equity indices Nifty. They found last two days of a month and first three days of a month have significant positive bias.[23]

The earlier studies concentrated on Day of the Week Effect, Monthly Effect and other anomalies. There have been evidences of Holiday Effect, January Effect and Halloween Effect in west as well as India. We could not find any research specifically aimed at studying "Monsoon Effect" in Indian equity market. In order to fill this gap, the present study is undertaken to analyze the impact of monsoon on Indian Stock Market.

RESEARCH METHODOLOGY

Statement of Problem

An efficient stock market can instantaneously process the information which would be reflected on security prices. The Information Transmission Mechanism Ensures that the stock returns across all days of the weeks and months are equal and the Market Participant, and the Rational Financial Decision Maker, cannot earn excess profits. It is to be noted that the returns constitute only one part of the decision making process. Another part of decision making is the calculation of risk or volatility of returns. It is important to note that there are variations in Volatility of Stock Returns by the Day-of-the Week, Month of the Year and Day of the Month. Some of the previous studies have focused on Month of the Year Effect. The studies have revolved around the possibility of Tax Loss Selling hypothesis in West. India being a developing country and dependent on monsoon there has to be a significant impact of rainfall on economy and stock market. This study attempts to understand the impact of monsoon on Indian equity market.

Need for Present Study

The previous literature on calendar anomalies in Indian equity market throws light on day of the month, day of the week and month of the year anomalies present in Indian equity market. There has not been a study focused on studying impact of monsoon on Indian equity market. This study will specifically attempt to understand the equity market behavior and outcome based on monsoon season.

Objectives of the Study

1. To investigate the existence of monsoon effect in Indian equity market.
2. To identify months with impact of monsoon on equity market.
3. To identify trading opportunity for market participants based on monsoon effect.

Hypothesis

1. The first hypothesis for the study is that returns of all the months of a year are equal, symbolically,

$H_0 : \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8 = \beta_9 = \beta_{10} = \beta_{11} = \beta_{12}$
$H_1 :$ *At least one* β_i *is different*

2. The second hypothesis for the study is that returns for the months June, July, August and September(Monsoon period) are same as other months of a year symbolically,

$H_0 : \beta_{6\ldots9} = \beta_{1,2,3,4,5,10,11,12}$
$H_1 : \beta_{6\ldots9} \neq \beta_{1,2,3,4,5,10,11,12}$

3. The third hypothesis for the study is that market delivers positive returns more number of times during monsoon months than other months of a year.

$H_0 : \beta p_{6\ldots9} = \beta p_{1,2,3,4,5,10,11,12}$
$H_1 : \beta p_{6\ldots9} \neq \beta p_{1,2,3,4,5,10,11,12}$

Data and its Source

The monthly data of S&P BSE Sensex for study is obtained from the website of Bombay Stock Exchange (www.bseindia.com) for the period 1st January 1992 to 31st December 2014. For the purpose of study the data has been divided into two parts, pre-monsoon and post-monsoon period. The pre-monsoon period is defined as January to May of a year and the post-monsoon period is defined as June to December of

a year. To test the presence of seasonal anomalies (Month-of-the-Year effect) and monsoon effect we have used dummy variable regression model. This technique is broadly used to quantity qualitative aspects such as gender, race etc. The independent variable takes only two values are called dummy variables. They are also popularly known as binary variables in literature. In dummy variables 1 indicates the presence of an attribute and 0 indicates absence of an attribute. We have used two regression models in this study OLS Regression and Logit Regression. To examine month-of-the-year effect following dummy regression model is specified.

$$Sensex\ Return = \beta_1 January + \beta_2 February + \beta_3 March + \beta_4 April + \beta_5 May \ldots\ldots\ldots \beta_{12} December$$

The variables January, February, March……..December are defines as:

January = 1 if the Month is January; 0 otherwise
February = 1 if the month is February; 0 otherwise
March = 1 if the month is March; 0 otherwise
April = 1 if the month is April; 0 otherwise
May = 1 if the month is May; 0 otherwise
June = 1 if the month is June; 0 otherwise
July = 1 if the month is July; 0 otherwise
August = 1 if the month is August; 0 otherwise
September = 1 if the month is September; 0 otherwise
October = 1 if the month is October; 0 otherwise
November = 1 if the month is November; 0 otherwise
December = 1 if the month is December; 0 otherwise

To test the significance of monsoon return similar dummy variables are used, where the presence of monsoon month is denoted by 1 and absence of monsoon is denoted by 0. For both the studies, month-of-the-year effect and significance of monsoon return the dependent variable is actual times series return. The month of June, July, August and September are represented by 1 and rest of the months are represented by 0 in this model.

To study the positive bias during monsoon months, that is we test that monsoon months are found to be delivering positive returns more number of times than rest of the period, we have used dummy variables, where the presence of monsoon months is denoted by 1 and rest of the months as 0. In this analysis (Logit), we have used dummy variables in dependent variables also. Here in dependent variable positive monthly return is denoted by 1 and negative by 0. The month of June, July, August and September are represented by 1 and rests of the months are represented by 0 in this model.

RESULTS

The Table 1 contains descriptive statistics of S&P BSE Sensex and ADF Test Statistics. From the descriptive statistics it is clear that the Sensex data is positively skewed and the Kurtosis also indicates that the monthly return series of Sensex is not normally distributed.

Table 1 Descriptive Statistics (%)

Summery Statistics	S&P BSE Sensex
Mean	1.1571
Median	1.2610
Standard Deviation	8.2323
Minimum	-27.2992
Maximum	35.0632
Skewness	0.0746
Kurtoisis	1.6691
ADF Test Statistics	-6.0734

The ADF Test statistics in Table 1 indicates that the series is stationary at 1% level of significance

The table 2 summarizes average return of Sensex for all the months of year for study period.

Table 2 Average Monthly Return (%)

Month	Average Return (%)	Maximum (%)	Minimum (%)
January	0.8655	18.7512	-13.9317
February	3.8061	27.0475	-8.5355
March	-0.5519	35.0632	-19.9334
April	0.8687	16.0897	-11.7398
May	-0.3313	24.8851	-25.7186
June	1.4725	12.5795	-19.8389
July	1.72	25.1271	-12.1881
August	2.0906	12.3324	-10.5129
September	1.5498	12.1124	-14.3346
October	-1.8964	13.7407	-27.2992
November	0.9107	18.9976	-13.3948
December	3.4548	14.6191	-4.9017

From Table 2 it is evident that the market has positive bias for the post monsoon period of June to December of a year. The average return for the pre monsoon period is found to be 0.9314% against post monsoon average return of 1.3289% per month. This means that on an average the pre monsoon period for Sensex delivers 4.657% return a year against post monsoon return of 9.3023%.

Month-of-the-Year Effect:

Model: OLS, using observations 1992:01-2014:12 (T = 276)
Dependent variable: Return

	Coefficient	Std. Error	t-ratio	p-value	
Jan	1.44571	1.80463	0.8011	0.42382	
Nov	1.26958	1.80463	0.7035	0.48239	
Feb	3.39352	1.80463	1.8805	0.06120	*
Apr	0.968376	1.80463	0.5366	0.59201	
Dec	3.75594	1.80463	2.0813	0.03842	**
Oct	-1.66779	1.80463	-0.9242	0.35628	
July	0.829529	1.80463	0.4597	0.64615	
June	1.7819	1.80463	0.9874	0.32439	
Aug	1.94107	1.80463	1.0756	0.28313	
Mar	0.00497207	1.80463	0.0028	0.99780	
Sep	1.78234	1.80463	0.9876	0.32427	
May	-0.388708	1.80463	-0.2154	0.82963	

Mean dependent var	1.259703	S.D. dependent var	8.410612
Sum squared resid	18055.06	S.E. of regression	8.464458
R-squared	0.029517	Adjusted R-squared	-0.012845
F(11, 252)	0.696776	P-value(F)	0.741281
Log-likelihood	-932.3304	Akaike criterion	1888.661
Schwarz criterion	1931.572	Hannan-Quinn	1905.904
rho	0.132359	Durbin-Watson	1.714757

The OLS regression confirms the presence of month-of-the-year effect in Sensex with the month of February is found to have return at 10% level of significance and the month of December is found to have return at 5% level of significance. In percentage terms these two months have average return of 3.81% and 3.45% respectively against average monthly return of all months amounting to 1.16%.

Significance of Monsoon Return

Model: OLS, using observations 1992:01-2014:12 (T = 276)
Dependent variable: v2

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
v1	1.58371	0.901338	1.7571	0.08007	*

Mean dependent var	1.259703	S.D. dependent var	8.410612
Sum squared resid	18802.41	S.E. of regression	8.455297
R-squared	0.011602	Adjusted R-squared	0.011602
F(1, 263)	3.087276	P-value(F)	0.080070
Log-likelihood	-937.6842	Akaike criterion	1877.368
Schwarz criterion	1880.944	Hannan-Quinn	1878.805
rho	0.137021	Durbin-Watson	1.703208

The OLS regression found the return of monsoon months significant at 10% level of significance. The all four monsoon months have average positive return of 1.47%, 1.72%, 2.09% and 1.55%. The total average monsoon return for the study period is found to be 6.83% which amounts to almost half of the Sensex average yearly return.

Positive Bias during Monsoon Period

Model: Logit, using observations 1992:01-2014:12 (T = 276)
Dependent variable: v2
Standard errors based on Hessian

	Coefficient	*Std. Error*	*z*	*p-value*	
v1	0.559616	0.221601	2.5253	0.01156	**

Mean dependent var	0.553030	S.D. dependent var	0.498124
McFadden R-squared	0.010065	Adjusted R-squared	0.004556
Log-likelihood	-179.6763	Akaike criterion	361.3526
Schwarz criterion	364.9285	Hannan-Quinn	362.7895

Number of cases 'correctly predicted' = 142 (53.8%)
f(beta'x) at mean of independent vars = 0.498
Likelihood ratio test: Chi-square(1) = 3.65382 [0.0559]

The Logit Regression model found positive bias of the market during monsoon period to be significant at 5% level of significance. This confirms that market has tendency to deliver positive returns during monsoon months of a year. OLS and Logit both models confirms the strong presence of "Monsoon Effect" in Indian equity market indices Sensex.

CONCLUSION

In the study we have tried to examine the presence of 'Monsoon Effect" in Indian equity market. We have considered S&P BSE Sensex as the representative of stock market in India and have tested if monsoon effect is present in Indian equity market or not using monthly data set. The analysis found that the average return for all the months of a year for Sensex is different and there exists "Month of a Year" anomaly. We also conclude that monsoon has positive bias on the India equity market and average monsoon return is found to be significantly higher than other period of a year, almost half of average yearly return is generated during four monsoon months in India. We also conclude that market has tendency to deliver positive return during monsoon months. This confirms that the Indian equity market is not efficient and participants can generate superior returns by timing the market.

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