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AN ANALYSIS OF DAY-OF-THE-WEEK AND INTRADAY EFFECTS IN THE INDIAN STOCK MARKET: EVIDENCE FROM NATIONAL STOCK EXCHANGE [*]

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ABSTRACT

Day of the week effect is one of the most important calendar anomalies that have been observed in many stock markets in all over the world with a lot of different results. Stock markets are speculative market, thus, investors are more concerned about which day is the best for the trade. The primary objective of this paper is to find out the significant day of the week effect in the emerging stock market of a developing country like India for the period January 2001 to December 2012. In order to fulfill the objectives of the paper, 5 models have been estimated. In each model risk factor is defined in different ways thereby leading to different results. Empirical results verify that NSE Nifty50 does not depict such day of the week effects on the intraday and inter-day stock returns. While index exhibits Wednesday effect on inter-day return of the index, Monday gives lowest return but maximum volatility. However, in certain cases, Friday also suffers from the lowest return indicating presence of reverse weekend effect in the Indian stock market.

Keywords: Conditional; Unconditional; Market risk factors; NSE; Day-Of-The-Week effects; Intraday effects; Indian Stock Market.

INTRODUCTION

Stock markets are more speculative market and its return depends on future course of action rather than past economic activities. Investors are concerned with the movement of the stock prices. Thus, seasonality is a vital factor for predicting stock market behavior. The existence of predictable seasonal behavior in stock returns may lead to profitable trading strategies and fair returns. The presence of calendar anomalies has been documented extensively for the last two decades in financial markets. The most common ones are the Weekend effect, January Effect and the Day of the Week Effect. The day of the week patterns have been investigated extensively in different markets. The variability of stock returns according to the day of the week is one of the most often analyzed seasonalities in the finance literature. It has been well acknowledged in finance literature that any predictable pattern in asset returns may be exploitable and therefore judged as evidence against semi-strong efficiency of asset markets. One statistically significant pattern in stock market returns stems

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from seasonality. As such, seasonal effects in securities markets have attracted much interest among both academics and practitioners.

The days of the week patterns have been investigated extensively in different stock markets around the globe. Earlier studies have found the existence of the day of the week effect not only in the USA and other developed markets but also in the emerging markets like Malaysia, Hong Kong, Turkey). Many western economies, (U.S.A., U.K., Canada) empirical results have shown that on Mondays the market has statistically significant negative returns while on Fridays statistically significant positive returns. Even in India also the days of the week effects in the same manner (Sunil, 1996). In other markets such as Japan, Australia, Singapore, Turkey and France the highest negative returns appear on Tuesdays (Nath et al., 2004). It refers to the tendency of the stocks to exhibit a relatively large returns on Friday compared to that of Monday. This pattern has been investigated in various stock markets around the world. This difference in the average return across the days of the week leads to changes in the investment strategy, portfolio selection and the profit management of the investors. The distribution of the stock return varies across the days of the week. The average return on Monday is significantly lower than the average return over the other days of the week. This paper concentrates on the day of the week effect on National Stock Exchange, India.

In the various related literatures the most satisfactory explanation that has been given for the negative returns on Mondays is that usually the most unfavorable news appears during the weekends. These unfavorable news influence the majority of the investors negatively, causing them to sell on the following Monday. The most satisfactory explanation that has been given for Tuesday's negative returns are that the bad news of the weekend affecting the market, influence negatively some markets lagged by one day.

National Stock Exchange of India

The National Stock Exchange was established in 1993, located in Mumbai. It has played an important role in reforming the Indian securities market. NSE has a market capitalization of more than US$0.989 trillion and 1,635 companies listed as of July 2013. There are many domestic and international institutions and companies that hold stake in the exchange. The CNX Nifty 50 is used extensively by investors in India and around the world to take exposure to the Indian equities market. However, CNX Nifty Junior and CNX Nifty 500 are also considered as the other indices of NSE. Trading on equities takes place on all the days of the week excluding Saturdays, Sundays and all the holidays. The pre-open session starts at 9.00 hrs in the morning and the closing session is held between 15.40 hrs and 16.00 hrs.

Objectives of the Study

This paper tries to analyze:

- The descriptive statistic properties for the day-of-the-week, i.e., to check for the normality of the returns (intraday and interday) for NSE index
- The stationarity of the returns (intraday and interday) using unit root test
- The day of the week effect on the stock market returns (both intraday and interday) with no market risk factors
- The day of the week effect on the stock market returns (both intraday and interday) incorporating a constant market risk factor
- The day of the week effect on the stock market returns (both intraday and interday) incorporating a daily market risk factor
- The day of the week effect on the stock market returns (both intraday and interday) incorporating conditional market risk factor

- The day of the week effect on the stock market returns (both intraday and interday) incorporating conditional daily market risk factor

LITERATURE REVIEW

Bayar and Kan(2002) taking nineteen countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong-Kong, Italy, Japan, the Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, the UK, and the USA) daily data from July 20, 1993 to July 1, 1998 and examined the daily patterns and observed that it differ for local currency and dollar denominated returns, the latter being exhibiting lower daily means and higher standard deviations compared to the former. In local currency terms, a pattern of higher returns around the middle of the week (Tuesday and then Wednesday) and a pattern of lower returns towards the end of the week (Thursday and then Friday) are observed. In dollar terms, a higher pattern occurs around the middle of the week (Wednesday and then Tuesday) and a lower one is observed towards the end of the week (Thursday and then Friday). The lower patterns are more apparent in both cases. Standard deviations on Mondays are the highest in both local currency and dollar returns. In local currency returns, volatility is the lowest towards the end of the week (Thursday and Friday) whereas the lowest standard deviations of dollar returns are observed on Tuesdays.

Tevdovski, Mihajlov & Sazdovski (2012) examined the day of the week effect in select stock markets of South Eastern Europe taking into account Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia and Serbia. The study covers the period 2006 to 2011. However, the paper goes through a multiple regression analysis incorporating Dummy variables. The result says that the average return on Monday is negative lower than that in any other days of the week. However, none of the days of the week is statistically significant in explaining variation in average return.

Basher and Sadorsky (2006) examined the days of the week effect in world's 21 emerging stock markets. The paper covers the period starting from 31 December 1992 to 31 October 2003. However, 5 models are been estimated in order to fulfil the objectives. The market risk factor has also been incorporated apart from the dummy variables in order to fulfil the objectives. However, different models give us different results but the overall day of the week effect is present in Philippines, Pakistan and Taiwan even after adjusting for market risk.

Aly Mehdian and Perry (2004) examined the day of the week effect in Capital Market Authority (CMA) Index, Egypt. The study covers the period starting from 1998 to 2001. However, the analysis considers Multiple Linear Regression Model incorporating dummy variables. Again, the Monday return has been analysed along the weeks of the month. The results conclude that the Monday return is positive and statistically significant. The other days of the week have insignificant impact on the average return. Moreover, the Monday return is significantly more volatile than the other days of the week. The intra-month return analysis concludes that the significantly positive Monday returns are not caused by higher returns during the last two weeks of the month.

Rodriguez (2012) examined the days of the week effect on return and volatilities in 6 major stock markets of Latin America covering the period 1993-2007. In order to find out the effects of days of the week on average return a Multiple Linear Regression Model has been estimated incorporating dummy variables and lagged value of the return. Moreover, the day of the week effect on the conditional variance has been analysed by estimating a MLRM incorporating dummy variables. The results conclude that the effect in volatilities is more frequent than the return. However, volatilities are higher on Monday return than on any other days of the week. Further, the weekend effect is prevalent in the Latin American Stock Markets.

Hussain, Hamid, Akash & Khan (2011) examined the days of the week effect in Karachi Stock Exchange, Pakistan. The data consider the daily stock prices of the KSE-100 Index covering the period January 2006 to December 2010. The analysis is carried out by estimating a Multiple Regression Model incorporating dummy variables. The result concludes that there exists a significant Tuesday effect in the market. Moreover, Tuesday has the highest return and all other days of the week exhibit constant return.

DATA AND METHODOLOGY

Start test from here. The data consist of daily opening and closing prices of National Stock Exchange (NSE) Index and the SPDR Global Dow ETF (DGT) Index. The data are collected from Yahoo India and the official website of NSE. The paper covers the period between 2 January 2001 and 31 December 2012. All the data are in US dollars so that the investment decisions are from the perspective of an US investor or an international investor who has US dollar trading account.

The data is converted in order to obtain the daily returns (both inter-day and intra-day return). This has been done according to the following formula:

$Rt = [(\text{closing price})_t - (\text{opening price})_t]/ (\text{opening price})_t \times 100$ where R_t is the intraday return (in percentage) for the t-th day.

$V_t = [(\text{closing price})_t - (\text{closing price})_{t-1}]/ (\text{closing price})_{t-1} \times 100$ where V_t is the interday return (in percentage) for the t-th day.

The paper tries to find out the Descriptive Statistics of both Intraday and Interday returns of NSE Nifty 50 Index. This is done in order to find out the presence of normality in the frequency distribution.

Test for the stationarity of the data series by applying Augmented Dicky-Fuller (ADF) Test. The model in which ADF test is applied is as follows:-

$$\Delta (Y_t) = \alpha + \beta_t + \Upsilon (Y_{t-1}) + \delta_1 \Delta (Y_{t-1}) + \ldots\ldots\ldots + \delta_{p-1} \Delta (Y_{t-p+1}) + €_t \ldots\ldots (1)$$

Here, α is a constant, β is the coefficient of the trend term (t) and p is the lag order of the autoregressive process. Y_t denotes the endogenous variables (R_t and V_t).

The following null hypothesis is tested:-

H0: $\Upsilon = 0$ against

H1: $\Upsilon < 0$

In order to find test the above hypothesis, a computed t-statistic has been formulated as

$ADF\tau = \ddot{Y}/ SE (\ddot{Y})$ where $\ddot{Y}$ is the estimated Υ.

If the absolute value of the computed ADF test statistic turns out to be greater than that of its theoretical value at 5% level of significance, we reject our null hypothesis where the null hypothesis is the presence of unit root or absence of stationarity. If the original series turns out to be non-stationary then we again go for unit root test at first difference. This process will continue until and unless the series turns out to be stationary.

In order to fulfill the objectives of the paper five different models are estimated and tested.

Model I: $R_t/V_t = \beta_1 D_{1t} + \beta_2 D_{2t} + \beta_3 D_{3t} + \beta_4 D_{4t} + \beta_5 D_{5t} + €_{1t}$

It is the simplest model. D_1, D_2, D_3, D_4, D_5 are the day of the week (0, 1) dummy variables for Monday,…Friday on which the return is observed that are incorporated to quantify the qualitative variables.

Model II: $R_t/V_t = \beta_1 D_{1t} + \beta_2 D_{2t} + \beta_3 D_{3t} + \beta_4 D_{4t} + \beta_5 D_{5t} + \gamma MR_t + €_{2t}$

Where MR is the market risk factor provided by the excess returns on the global index. In this model, the risk factor is constant across the week.

Model II can be improved by adding slope interaction dummy variables that allow risk to vary across the days of the week.

Model III: $R_t/V_t = \beta_1 D_{1t} + \beta_2 D_{2t} + \beta_3 D_{3t} + \beta_4 D_{4t} + \beta_5 D_{5t} + \gamma_1 (D_{1t} MR_t) + \gamma_2 (D_{2t} MR_t) + \gamma_3 (D_{3t} MR_t) + \gamma_4 (D_{4t} MR_t) + \gamma_5 (D_{5t} MR_t) + €_{3t}$

All the above 3 models include unconditional risk factor. The next two models are the conditional models that include the conditional market risk factors. Model 4 & 5 are the conditional models that allow for asymmetric market effects. Model 4 is similar to model 2. The only difference is that model 4 includes a conditional variable that depends upon whether the market risk is positive or negative. On the other hand, model 5 includes slope dummy variables that include the market risk as well as the days of the week variables.

Model IV: $R_t/V_t = \beta_1 D_{1t} + \beta_2 D_{2t} + \beta_3 D_{3t} + \beta_4 D_{4t} + \beta_5 D_{5t} + \gamma_u D_{ut} MR_t + \gamma_d Dd_t MR_t + €_{4t}$

Where D_u & D_d are the dummy variables taking the values

D_u= 1 if MRt is positive

= 0 otherwise

D_d = 1 if MRt is non-positive

= 0 otherwise

Model V is a conditional model that also includes slope interaction terms between the day of the week variables and up (down) excess market returns.

Model V: $R_t/V_t = \beta_1 D_{1t} + \beta_2 D_{2t} + \beta_3 D_{3t} + \beta_4 D_{4t} + \beta_5 D_{5t} + \alpha_1 D_{1t} (D_{ut} MR_t) + \alpha_2 D_{2t} (D_{ut} MR_t) + \alpha_3 D_{3t} (D_{ut} MR_t) + \alpha_4 D_{4t} (D_{ut} MR_t) + \alpha_5 D_{5t} (D_{ut} MR_t) + €_{5t}$

Model V allows the conditional risk to vary across the days of the week.

The error terms are assumed to be independent and identically distributed with a zero mean and constant variance.

Since the slope coefficients and the intercept term in the population regression model are unknown hence, we go for sample testing and estimate the sample regression model and analyze whether the estimated model fits into the data well or not.

Now, we have to test how significant is the difference in the expected return of all the weekdays. For that, we go for the individual significance of the intercept and slope terms. Hence, we test the hypothesis:-

To Test

Ho: βi =0 against H1: βi ≠0

Ho: γi=0 against H1: γi ≠0

Ho: γu =0 against H1: γu ≠0

Ho: γd =0 against H1: γd ≠0

Ho: αi=0 against H1: αi ≠0

In order to test the above hypothesis, we compute a t-statistic and then perform a t-test.

ti = Bi/SE (Bi) ~ tn-5,λ

= Ÿi/ SE (Ÿi) ~ tn-10, λ

= Ÿu/ SE (Ÿu) ~ tn-7, λ

= Ÿd/ SE (Ÿd) ~ tn-7, λ

= ȧ/ SE (ȧ) ~ tn-10, λ Where λ is the level of significance and i = 1, 2,3,4,5.

Bis, Ÿis, Ÿu, Ÿd and ȧis are the estimated coefficients of the models.

TABLE 1
Interpreting the t-Statistic and the p-Values

Results	P - Value	Significance	Decision
t(> + 2.0 or < -2.0)	Small p (<0.05)	Yes Significant difference of means	Reject H_0

In order to test for the overall significance of the model, we test the following hypothesis:-

Ho: β1= β2 = β3 = β4 = β5 = 0……Model I

Ho: β1= β2 = β3 = β4 = β5 = ɣ=0…….. Model II

Ho: β1= β2 = β3 = β4 = β5 = ɣ1= ɣ2 = ɣ3= ɣ4= ɣ5=0…….. Model III

Ho: β1= β2 = β3 = β4 = β5 = ɣu= ɣd=0…….. Model IV

Ho: β1= β2 = β3 = β4 = β5 = α1= α 2 = α 3 = α 4 = α5 =0…… Model V against

H1: At least one of the βs/ɣs/ ɣu /ɣd/αs not equal to zero.

Interpreting the F-Statistic and P-Values:

F = ESS/K× N-K/RSS ~ FK,N-K Where λ is the level of significance,
N is the number of observations and
K is the number of parameters included in the model

= ESS/RSS× N-K/K
= (R2/1-R2) × N-K/K.

TABLE 2
Decision Criteria

Results	p-value	Significance	Decision
Big F	Small p (<0.05)	Yes (there is a relation)	Reject Ho Accept H1
Small F	Big p (> 0.05)	No (there is no relationship)	Accept Ho Reject H1

EMPIRICAL ANALYSIS

Descriptive Statistics

TABLE 3
Results of Descriptive Statistics

	(Intraday Returns)					(Interday Returns)				
	Mon	Tues	Wed	Thurs	Fri	Mon	Tues	Wed	Thurs	Fri
Mean	-0.001	0.04	0.09	0.01	0.03	0.02	0.08	0.12	0.03	0.07
Median	0.07	0.03	0.05	0.13	0.05	0.10	0.10	0.12	0.16	0.08
Max	17.69	7.97	6.13	6.25	7.02	17.74	8.29	6.21	6.30	6.99
Min	-12.24	-6.62	-6.18	-6.81	-11.99	-12.2	-6.66	-6.18	-6.77	-12.20
Std Dev	1.86	1.44	1.47	1.44	1.66	1.88	1.45	1.49	1.46	1.70
Skewness	0.57	0.14	0.12	-0.30	-0.74	0.55	0.15	0.13	-0.30	-0.74
Kurtosis	20.19	7.19	5.70	5.21	9.65	19.58	7.25	5.50	5.16	9.30
Jarque Bera	7422.48	441. 7611	182. 63	131.08	1162.97	6890. 57	453.97	157.09	125.09	1051.26
Prob	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Obs.	600	600	598	596	600	599	599	597	595	599

Intraday return. The maximum average return is on Wednesday followed by Tuesday and Friday. However, Monday exhibits near about zero return. This implies that the average returns vary among the days of the week. The volatility is maximum on Monday with the value of the Standard Deviation equal to 1.86. The value of the skewness and kurtosis suggest that the return distribution is not a normal distribution for all the days of the week. Further the null hypothesis for the Jarque-Bera test of the presence of normal distribution has been rejected at 1% level of significance.

Interday return. The maximum average return is on Wednesday followed by Tuesday and Friday. This implies that the average returns vary among the days of the week. However, the average return is positive in all the days of the week. The volatility is maximum on Monday with the value of the Standard Deviation equal to 1.88. The value of the skewness and kurtosis suggest that the return distribution is not a normal distribution for all the days of the week. Further the null hypothesis for the Jarque-Bera test of the presence of normal distribution has been rejected at 1% level of significance.

Investigation of Unit Root

The unit root test for the stationarity has been applied for both intraday and interday returns. Here, both Augmented Dickey-Fuller (ADF) tests as well as the Phillip- Perron (PP) tests are considered. The p-values turn out to be 0.00 which implies that the null hypothesis of the presence of unit root (absence of stationarity) has been rejected at both 1% and 5% levels of significance at level. Hence we need not go for transforming the data series as the data series is stationary itself and we can run econometric tests on the original series itself.

TABLE 4
Results of Unit Root Test

	Intraday Return	Interday Return
ADF Test	-39.38	-39.23
p-value	0.00	0.00
Philips Perron Test	-51.27	-50.95
p-values	0.00	0.00

Model I: No Market Risk Factor

TABLE 5
Model I

	Intraday Return	Interday Return
Monday	-0.01	0.01
	(-0.17)	(0.19)
Tuesday	0.05	0.07
	(0.62)	(0.76)
Wednesday	0.10	0.10
	(1.08)	(1.41)
Thursday	0.02	0.01
	(0.27)	(0.16)
Friday	0.04	0.06
	(0.51)	(0.66)
F-Statistic	0.33	0.43
Prob. (F-statistic)	0.86	0.78

Intraday return. None of the days of the week is statistically significant in explaining variation in average return of NSE. However, Monday exhibits negative and the lowest return among all the days of the week. However, the overall model is also statistically insignificant as the Prob. (F-statistic) turns out to be greater than 0.01 and 0.05. Hence, the null hypothesis of insignificance of the overall model is accepted at both 1% and 5% levels of significance.

Interday return. None of the days of the week is statistically significant in explaining variation in average return of NSE. However, Monday exhibits positive but lowest return among all the days of the week. However, the overall model is also statistically insignificant as the P-value of the F-statistic turns out to be greater than 0.01 and 0.05. Hence, the null hypothesis of insignificance of the overall model is accepted at both 1% and 5% levels of significance.

Model II: Constant Market Risk Factor

TABLE 6
Model II

	Intraday Return	Interday Return
Monday	0.03	0.001
	(0.90)	(0.03)
Tuesday	0.04	0.07
	(0.82)	(1.14)
Wednesday	0.02	0.003
	(0.37)	(0.06)
Thursday	-0.01	0.03
	(-0.26)	(0.49)
Friday	0.009	-0.002
	(0.17)	(-0.03)
Market Risk(MR)	0.66	0.61
	(75.43)	(53.005)
F-Statistic	*1138.82*	*562.59*
Prob. (F-statistic)	*0.00*	*0.00*

Intraday return. In the above model as well, none of the days of the week is statistically significant in explaining variation in the average return of NSE. The difference in the average return between Thursday and Monday is negative. However, the market risk factor is a positive fraction and statistically significant in explaining variation in the expected intraday return. Positive market risk factor implies that the concerned stock market is less risky than the world market. However, the overall model is also statistically significant as the Prob. (F-statistic) turns out to be greater than 0.01 and 0.05. Hence, the null hypothesis of insignificance of the overall model is accepted at both 1% and 5% levels of significance.

Interday return. In the above model as well, none of the days of the week is statistically significant in explaining variation in the average return on NSE. The difference in the average return between Friday and Monday is negative. However, the market risk factor is a positive fraction and statistically significant in explaining variation in the expected intraday return. Positive market risk factor implies that the concerned stock market is less risky than the world market. However, the overall model is also statistically significant as the

Prob. (F-statistic) turns out to be greater than 0.01 and 0.05. Hence, the null hypothesis of insignificance of the overall model is accepted at both 1% and 5% levels of significance.

Model III: Market Risk Factor across the Days of the Week

TABLE 7
Model III

	Intraday Return	Interday Return
Monday	0.04	0.006
	(1.16)	(0.12)
Tuesday	0.03	0.06
	(0.52)	(0.95)
Wednesday	0.01	0.005
	(0.23)	(0.07)
Thursday	-0.02	0.03
	(-0.45)	(0.41)
Friday	-0.008	-0.02
	(-0.15)	(0.72)
Risk Monday	0.76	0.68
	(41.85)	(28.29)
Risk Tuesday	0.66	0.56
	(31.05)	(21.04)
Risk Wednesday	0.62	0.58
	(29.86)	(21.65)
Risk Thursday	0.63	0.52
	(30.00)	(20.47)
Risk Friday	0.61	0.68
	(34.78)	(26.88)
F-Statistic	638.49	318.47
Prob. (F-statistic)	0.00	0.00

Intraday return. In the above model as well none of the days of the week is statistically significant in explaining variation in average return. The difference in average return between Thursday and Monday and that of Friday and Monday are negative. Other days exhibit insignificant but positive return. Here, the risk factor is allowed to vary across the days of the week. However, all the market risk factors are statistically significant which is clear from their respective estimated t-statistics given in parenthesis. Moreover, the overall model is also significant as the Prob. (F-statistic) is less than 0.05 and 0.01. Hence, the null hypothesis of overall insignificance of the model is rejected at both 1% and 5% levels of significance.

Interday return. For Interday return as well none of the days of the week is statistically significant in explaining variation in average return. The difference in average return between Friday and Monday turns out to be negative. Other days exhibit insignificant but positive return. Here, the risk factor is allowed to vary across the days of the week. However, all the market risk factors are statistically significant which is clear from their respective estimated t-statistics given in parenthesis. Moreover, the overall model is also significant as the Prob. (F-statistic) is less than 0.05 and 0.01. Hence, the null hypothesis of overall insignificance of the model is rejected at both 1% and 5% levels of significance.

Model IV: Conditional Market Risk Factor

TABLE 8
Model IV

	Intraday Return	Interday Return
Monday	0.04	0.03
	(0.55)	(0.47)
Tuesday	0.08	0.09
	(0.93)	(1.007)
Wednesday	0.01	0.07
	(0.17)	(0.76)
Thursday	0.001	0.05
	(0.02)	(0.61)
Friday	-0.01	0.06
	(-0.11)	(0.64)
Market Risk Up	-0.01	-0.02
	(-0.40)	(-0.78)
Market Risk Down	0.02	0.01
	(0.95)	(0.55)
F-Statistic	0.39	0.31
Prob. (F-statistic)	0.88	0.93

Intraday return. In this model, none of the days of the week is statistically significant in explaining variation in the average return of NSE. Moreover, the difference in average return between Friday and Monday turns out to be negative. This implies existence of Reverse Weekend Effect. Other days exhibit insignificant but positive returns. Here, conditional risk factors are incorporated that are also statistically insignificant. However, the conditional market risk factor has negative coefficients when excess return of NSE from the world index turns out to be positive. The opposite happens when the excess return of NSE from the world index is negative. The overall model turns out to be insignificant which is clear from the Prob. (F-statistic).

Interday return. None of the days is statistically significant in explaining variation in the average return of NSE index. However, all difference in the average return for all the days of the week with that of Monday turn out to be positive but insignificant. The Conditional risk factors incorporated are also statistically insignificant. However, the conditional market risk factor has negative coefficient when excess return of NSE from the world index turns out to be positive. The opposite happens when the excess return of NSE from the world index is negative. The overall model turns out to be insignificant which is clear from the Prob. (F-statistic).

MODEL V: Conditional Risk Factor across the Days of the Week

TABLE 8
Model V

	Intraday Return	Interday Return
Monday	0.002(0.03)	-0.08 (-0.90)
Tuesday	0.04(0.31)	0.16 (1.25)

	Intraday Return	Interday Return
Wednesday	0.08(0.66)	0.28 (2.13)
Thursday	0.08(0.61)	0.19 (1.46)
Friday	0.07(0.61)	0.23 (1.81)
Risk Monday Up	0.03(0.57)	0.10 (1.72)
Risk Tuesday Down	0.01(0.25)	-0.03 (-0.60)
Risk Wednesday Up	0.08(1.28)	0.01 (0.21)
Risk Thursday Down	-0.02(-0.31)	-0.01 (-0.18)
Risk Friday Up	-0.05(-0.76)	-0.10 (-1.83)
Risk Monday Down	0.03(0.59)	0.08 (0.99)
Risk Tuesday Up	-0.02(-0.32)	-0.06 (-0.82)
Risk Wednesday Down	0.07(1.29)	0.01 (0.25)
Risk Thursday Up	-0.08(-1.52)	-0.08 (-1.20)
Risk Friday Down	0.02(0.38)	0.05 (0.87)
F-Statistic	0.58	0.72
Prob(F-statistic)	0.88	0.76

Intraday return. None of the days of the week is statistically significant in explaining variation in average return of NSE index. All the days of the week exhibit positive but insignificant returns. However, the conditional market risk factor has been allowed to vary across the days of the week. But all the market risk factors turn out to be statistically insignificant which is clear from the t-statistic. The overall model also turns out to be statistically insignificant. The computed Prob. (F-statistic) is greater than 0.01 and 0.05.

Interday return. None of the days of the week is statistically significant in explaining variation in average return of NSE index. The Monday return is negative and insignificant. However, the rest of the days of the week exhibit positive and insignificant returns. However, the conditional market risk factor has been allowed to vary across the days of the week. But all the market risk factors turn out to be statistically insignificant which is clear from the t-statistic. The overall model also turns out to be statistically insignificant. The computed Prob. (F-statistic) is greater than 0.01 and 0.05.

CONCLUSION

This paper investigates empirically the day-of-the-week effect anomaly on stock returns for the period from 2001 to 2012 using both high frequency and close to close returns calculated using the main market index S&P CNX NIFTY. Five different models are applied.

The first model incorporates only dummy variables assuming no market risk factor. The second model incorporates a constant market risk factor. Similarly, the third model considers the market risk factor to vary across the day of the week. Moreover, the fourth model takes into account conditional market risk factor. Finally in the last model, the conditional risk factor is allowed to vary across the days-of-the-week. The NSE Nifty Index does not exhibit any such day of the week effect whatever be the type of model specified. The exception to it is Model V in which the index exhibits Wednesday effect on Interday return of the index. Moreover, Monday is the day of lowest return and highest volatility. However, in certain cases, Friday also suffers from the lowest return indicating presence of reverse weekend effect in the stock market. Moreover, Model II and Model III are the significant models to explain variation in both Intraday and Interday Returns of NSE Nifty 50 Index. The reason behind this may be that stock market is still in emerging stage in India which is suffering from informational insufficiency. However, we can go for further research on the paper by testing for the presence of volatility in the data series by incorporating ARCH, GARCH, E-GARCH and TARCH models.

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