"A STUDY ON DAY OF THE WEEK EFFECT ON STOCK RETURN AND VOLATILITY: EVIDENCE FROM INDIAN STOCK MARKET"

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ABSTRACT:
The day-of-the-week effect is a phenomenon that constitutes a form of anomaly of the efficient capital markets theory. According to this phenomenon, the average daily return of the market is not the same for trading days of the week, as we would expect on the basis of the efficient market theory. The most commonly tested seasonal anomalies are day of the week effect, month of the year effect, holiday effect, Monday effect and Friday effect. This study attempts to test whether the day of the week effect is present in the stock returns and volatility: evidence from Indian stock market. The study is descriptive in nature and it is based on secondary data. This study investigates day of the week effect on the available data of daily returns on the basis of their capitalization with the period from January 2007 to December 2017. In this study we collect data from the Sensex. The study has selected five companies namely Reliance Industries Ltd, Tata Consultancy Services Ltd., ITC Limited, Bharti Airtel Limited and LARSEN & TOUBRO LTD. This study is helpful for the investor while they invest their money in the stock market. The problem of the study is to check abnormal return for specific Seasons. The limitation of study is that we have selected only few companies. The study takes examines the impact on Indian stock market by collecting stock prices of selected companies using E-views.

Key word: Day-of-the-week effect, stock returns, volatility.

1. INTRODUCTION

The famous efficient market hypothesis (EMH) was introduced by Fama (1965) few decades ago which claims that in an efficient market stock prices always fully reflect available information. If the stock markets are efficient, stock prices are supposed to follow random walk. The random walk hypothesis states that future prices are not predictable on the basis of past prices, that is, stock price changes are unpredictable. The information contained in the past prices is fully and instantaneously reflected in current prices in an efficient market as argued by Fama (1965). Subsequent to study of Fama (1965) a good number of researches have been conducted to examine the randomness of stock price behavior to conclude about the efficiency of a capital market.

Since the introduction of EMH by Fama (1965) which states that the expected return on a financial asset should be uniformly distributed across different units of time, researchers have documented several calendar anomalies in the stock returns such as January effect, Turn of the month effect and Day of the week effect or Monday effect, Holiday effect and so on. The existence of the calendar anomalies is a denial of the weak form of efficient market hypothesis which states that stock returns are time invariant which means that there is no short-term seasonal pattern in the stock returns. The subsistence of seasonal pattern in the stock return infers that a market is inefficient and investors should be able to earn abnormal return. That's why finance researchers have been interested to find out the existence of the calendar anomalies or seasonality in the stock returns in different markets. Among the calendar anomalies day of the week effect is most widely documented anomaly and have been comprehensively investigated by the finance researchers in different markets of different countries considering different securities and indices and different institutional framework.

The day-of-the week effect refers to the tendency of stocks to exhibit relatively large returns on Fridays compared to those on Mondays. This is a particularly puzzling anomaly because, as Monday returns span three days, if anything, one would expect returns on a Monday to be higher than returns for other days of the week due to the longer period and the greater risk.

INTRODUCTION ABOUT SELECTED COMPANIES:

1. Reliance Industries Ltd.:
Reliance Industries Limited (RIL) is an Indian conglomerate holding company headquartered in Mumbai, Maharashtra, India. Reliance owns businesses across India engaged in energy, petrochemicals, textiles, natural resources, retail, and telecommunications. Reliance is the most profitable company in India, the largest publicly traded company in India by market

capitalization, and the second largest company in India as measured by revenue after the government-controlled Indian Oil Corporation. The company is ranked 215th on the Fortune Global 500 list of the world's biggest corporations as of 2016.

2. Tata Consultancy Services Ltd.:
Tata Consultancy Services Limited (TCS) is an Indian multinational information technology (IT) service, consulting and business solutions company Headquartered in Mumbai, Maharashtra It is a subsidiary of the Tata Group and operates in 46 countries.
TCS is one of the largest Indian companies by market capitalization ($80 billion).TCS is now placed among the most valuable IT services brands worldwide. TCS alone generates 70% dividends of its parent company, Tata Sons In 2015, TCS is ranked 64th overall in the *Forbes* World's Most Innovative Companies ranking.

3. ITC Ltd.:
ITC Limited or ITC is an Indian conglomerate headquartered in Kolkata, West Bengal. Its diversified business includes five segments: Fast-Moving Consumer Goods (FMCG), Hotels, Paperboards & Packaging, Agri Business & Information Technology.
Established in 1910 as the Imperial Tobacco Company of India Limited, the company was renamed as the Indian Tobacco Company Limited in 1970 and further to I.T.C. Limited in 1974. The periods in the name were removed in September 2001 for the company to be renamed as ITC Ltd.2005-09, by Boston Consulting Group.

4. Bharti Airtel Limited:
Bharti Airtel Limited is an Indian global telecommunications services company based in New Delhi, India. It operates in 17 countries across South Asia and Africa. Airtel provides GSM, 3G and 4G LTE mobile services, fixed line broadband and voice services depending upon the country of operation. Airtel had also rolled out its Volte technology across ten cities namely Mumbai, Maharashtra, Goa, Madhya Pradesh, Chhattisgarh, Gujarat, Andhra Pradesh & Telangana, Karnataka and Chennai in India and should roll out the technology in rest cities by March 2018. It is the largest mobile network operator in India and the third largest in the world with over 386 million subscribers.

5. LARSEN & TOUBRO LTD.:
Larsen & Toubro, commonly known as L&T, is an Indian multi-national firm headquartered in Mumbai, Maharashtra, India. It was founded by two Danish engineers taking refuge in India. The company has business interests in engineering, construction, manufacturing goods, information technology, and financial services, and has offices worldwide.

2. LITERATURE REVIEW

Rakibul Islam, Nadira Sultana (2015) studied on Day of the Week Effect on Stock Return and Volatility: Evidence from Chittagong Stock Exchange. The study focuses on examining the stochastic process of return distribution in the Chittagong stock exchange (CSE) to deliver persistency of weak form of efficiency and time varying risk -return association for an emerging country like Bangladesh. The data has been drawn from 1st January 2004 to 30th September 2014 producing 2515 observation for study. The empirical findings attained from the models verified that the day-of-the-week effects on stock returns and volatility are persistent in the stock market. Specifically, a negative effect is observed for Sunday while a positive effect occurs on Thursday. Moreover, the highest volatility occurs on Sunday and lowest volatility found in Thursday.

N. P. Ravindra Deyshappriya (2014) studied on An Empirical Investigation on Stock Market Anomalies: The Evidence from Colombo Stock Exchange in Sri Lanka. The existences of both Day of the Week Effect and Monthly Effect have been tested using daily and monthly data respectively. The sample period was divided in to two periods as War Period and Post War Period. The results indicate the presence of negative Monday effect and the positive effects for all other days only for the war period. Further, the positive volatility effect on Monday and the negative volatility effect on Friday have been examined for both war period.

S C THUSHARA, PRABATH PERERA (2012) analyzed Day of the Week Effect of Stock Returns: Empirical Evidence from Colombo Stock Exchange. This study attempts to test whether the day of the week effect is present in the stock returns of the Colombo Stock Exchange. For this purpose, stock returns based on ASPI for the period of 2002 to 2011 with 2390 observation are taken into account. The main purpose of this study is to provide some assistance to investors to formulate profitable trading strategies by predicting the share price behaviours with the information of these anomalies. Due to this day of the week effect, investors can earn an abnormal return by buying stocks on Mondays and Tuesdays and selling stocks on Wednesdays, Thursdays and Fridays. Further it can be concluded that Colombo Stock Exchange is not weak form efficient as investors can earn abnormal returns by trading on strategy based on past information.

Nik Maheran Nik Muhammad et. al (2010) studied on Efficient Market Hypothesis and Market Anomaly: Evidence from Day-of-the Week Effect of Malaysian Exchange**.** The preliminary evidence indicates that the initial confidence in the Efficient Market Hypothesis (EMH) might have been misplaced. The present study was trying to sought for the answer of following questions: Is the return on common stocks usually distributed, as much as finance theory assumes? How has the volatility of stock returns changed over time? From the study it is revealed that the weekend effect or the day of the week effect was present in the Malaysian market. The pattern of the effect changed over time from negative Monday and Wednesday, positive Friday to negative Monday and positive Friday.

3. RESEARCH METHODOLOGY:

3.1 Problem Statement:

The problem of the study is to check abnormal return for specific Seasons. The importance of the study is to find out whether the market is efficient or not and to earn abnormal returns when the market is efficient.

3.2 Objective of the Study:

- To examine day of the week effect and anomaly in Indian Stock Market.
- To evaluate the stocks return with the help of day of the week effect.
- To investigate the existence of day of the week effect anomaly in Indian Stock Market.

3.3 Research Design: The present study focuses on day of the week effect on stock return and volatility: evidence from Indian stock market. The study is descriptive in nature and it attempts to examine the behaviour of stock prices of selected companies for selected duration.

3.4 Data collection tool: The data has been taken from secondary sources. The study has collected 534 observations in terms of daily returns for each company.

3.5 List of Selected companies:

SR No.	List of Company
1	Reliance Industries Ltd.
2	Tata Consultancy Services
3	ITC Ltd.
4	Bharti Airtel Ltd.
5	LARSEN & TOUBRO LTD.

3.6 Tools and Techniques for Evaluation: The data has been analysed by using descriptive statistics, ADF unit root test, return charts and granger causality.

4. ANALYSIS:

TABLE 4.1: SHOWING DESCRIPTIVE STATISTICS OF SELECTED COMPANIES:

	RELIANCE INDUSTRIES LTD				
	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Mean	-0.077298	-0.032532	0.109228	-0.236901	-0.059612
Median	-0.113	-0.1305	0.055	-0.2405	-0.0815
Maximum	12.236	7.859	10.586	8.465	10.416
Minimum	-8.973	-10.187	-14.521	-6.519	-15.434
Std. Dev.	2.007691	1.859123	2.103979	1.733111	2.267083
Skewness	0.081151	0.029965	-0.31166	0.076799	-0.773506
Kurtosis	6.961057	6.618911	11.92091	5.047355	11.49785
Observations	534	534	534	534	534

TATA CONSULTANCY LTD.					
	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Mean	-0.07887	-0.10203	0.036753	-0.03268	0.093406
Median	-0.1695	-0.1785	-0.0225	-0.1055	-0.068
Maximum	11.207	15.261	9.964	10.151	16.795
Minimum	-8.875	-15.421	-6.788	-11.905	-9.891
Std. Dev.	2.129886	2.145454	1.938391	1.909175	2.257189
Skewness	0.601184	0.293025	0.875318	0.122314	1.246856
Kurtosis	7.500708	14.95749	6.926038	8.799964	12.19499
Observations	534	534	534	534	534

	LARSEN & TOUBR				
	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Mean	-0.130843	-0.115571	-0.173691	-0.13567	0.0152
Median	-0.132	-0.184	-0.214	-0.232	-0.0925

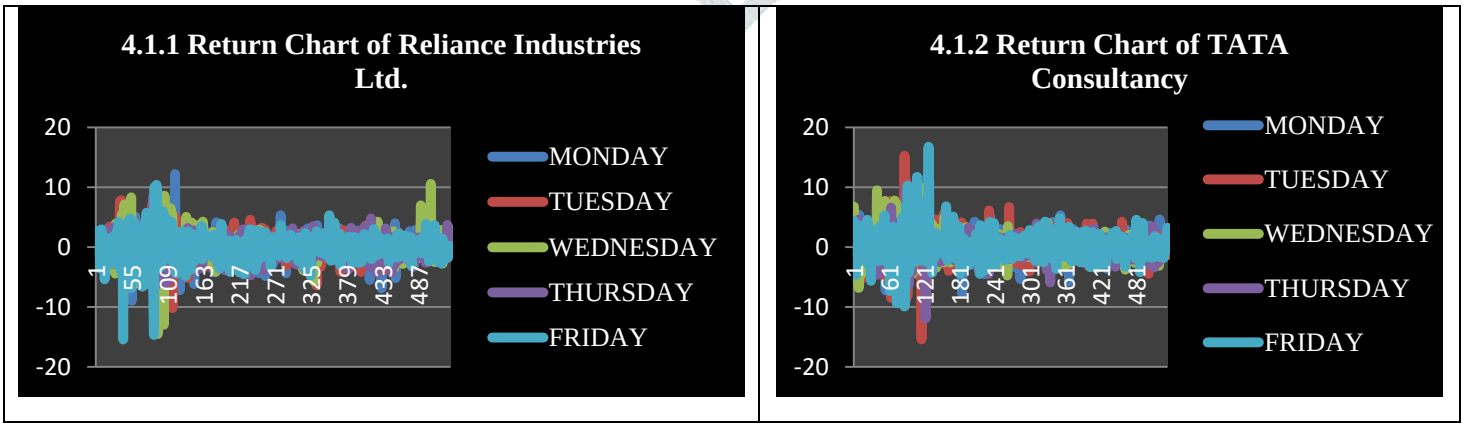
Maximum	13.842	8.439	8.943	7.568	11.402
Minimum	-18.904	-8.271	-10.685	-8.43	-7.561
Std. Dev.	2.6554	1.993048	1.977074	2.010398	2.193168
Skewness	-0.81257	0.225945	-0.16263	-0.024386	0.523832
Kurtosis	13.42335	4.789963	7.245488	4.878158	5.845294
Observations	534	534	534	534	534

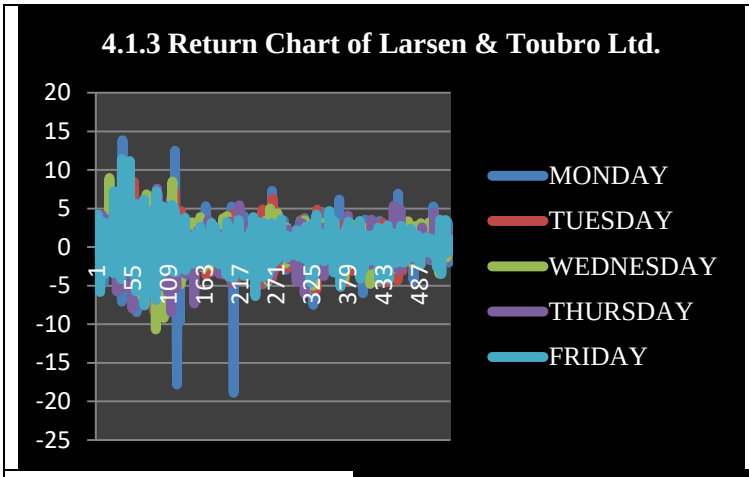
	ITC LTD.				
	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Mean	-0.16134	-0.09328	-0.07223	-0.09371	-0.10129
Median	-0.2475	-0.0985	-0.164	-0.078	-0.061
Maximum	8.333	8.038	9.112	4.523	7.974
Minimum	-6.682	-7.167	-7.03	-5.343	-6.431
Std. Dev.	1.906655	1.712943	1.695871	1.54866	1.703707
Skewness	0.075404	0.282463	0.605759	-0.10059	0.040343
Kurtosis	5.25523	5.489516	7.124922	3.794176	4.552992
Observations	534	534	534	534	534

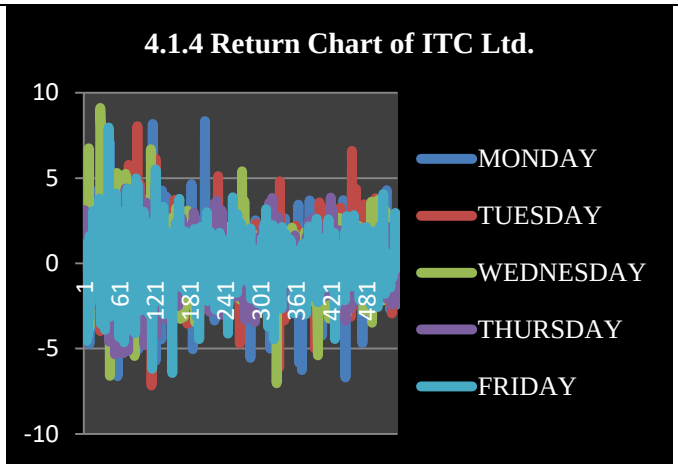
	BHARTI AIRTEL LTD.				
	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Mean	-0.14058	-0.15322	-0.09409	-0.26755	-0.08206
Median	-0.1435	-0.208	-0.275	-0.1715	-0.1995
Maximum	10.635	10.57	10.593	7.024	17.108
Minimum	-12.492	-11.002	-8.549	-8.162	-12.249
Std. Dev.	2.210539	2.34388	2.224184	2.048631	2.379083
Skewness	-0.32488	-0.2273	0.512743	-0.26067	0.881079
Kurtosis	7.395059	6.148583	5.398736	4.833223	10.87463
Observations	534	534	534	534	534

Table 4.1 represents descriptive statistics of daily return of selected companies. From the above analysis it can be said that the average return was high on Wednesday and the more volatility in return it seen on Friday. The value of skewness is not equal to zero in any of the indices selected which means that the data is skewed. The value of kurtosis is greater than zero which indicates that return of selected indices follow leptokurtosis. Leptokurtosis situation arises when high volatility period of financial markets are followed by relatively stable period.

4.1 CHARTS SHOWING THE DAILY RETURN OF SELECTED COMPANIES:







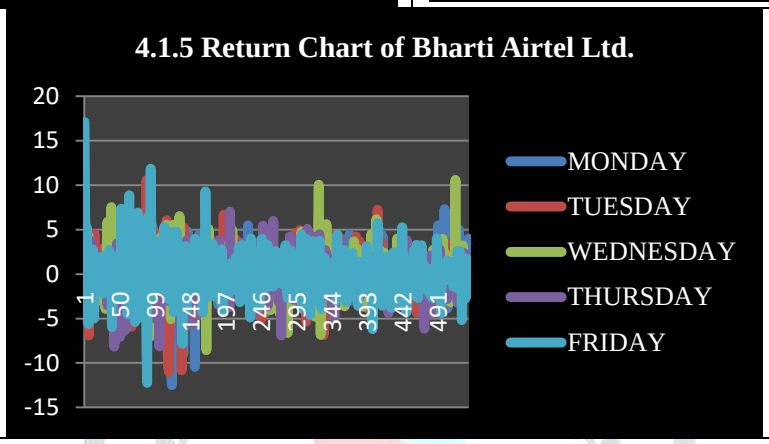


Chart 4.1 depicts return of selected company for selected time period. X-Axis represents number of days and Y-Axis represents returns of selected company. It can be observed form the above charts that there is more fluctuation in daily return of selected companies. From the above charts it can be said that the maximum daily return was high on Wednesday. And the more volatility in daily return was seen on Friday.

TABLE 4.2: AUGMENTED DICKEY-FULLER UNIT ROOTS TEST RESULTS:

Augmented Dickey-Fuller test statistic						
		RELIANCE INDUSTRIES LTD	TATA CONSULTANCY Ltd.	LARSEN & TOUBR	ITC Ltd.	BHARTI AIRTEL Ltd.
Test critical values	t-Statistic	-23.37393	-20.09987	-23.6462	-22.94551	-20.99466
	1% level	-3.975078	-3.975367	-3.975367	-3.975367	-3.975367
	5% level	-3.418133	-3.418274	-3.418274	-3.418274	-3.418274
	10% level	-3.131539	-3.131623	-3.131623	-3.131623	-3.131623

Augmented Dickey-Fuller Unit Root Test has been performed with an objective to examine whether data series is stationary or not. (Ho: Data series contains a unit root). Data series will be considered as stationary if there are not unit roots. It can be seen in Table 4.2 that t-statistics for all selected companies and market is less than values at 1% level, 5% level and 10% level. It means selected companies and market returns for selected duration do not contain a unit root and data series are stationery. Most of the statistical forecasting methods are based on the assumption that data series are approximately stationary. The statistical properties of stationery data series remains same in future as they have been in past.

TABLE 4.3: SHOWING THE RESULT OF GRANGER CAUSALITY TEST:

		RELIANCE INDUSTRIES LTD.		TATA CONSULTANCY LTD.		LARSEN & TOUBR		ITC LTD		BHARTI AIRTEL LTD.	
Null Hypothesis:	Obs	F-Statistic	Prob.	F-Statistic	Prob.	F-Statistic	Prob.	F-Statistic	Prob.	F-Statistic	Prob.

TUESDAY does not Granger Cause MONDAY	534	0.13617	0.8727	1.71074	0.1817	0.36275	0.6959	1.34374	0.2618	0.44969	0.6381
MONDAY does not Granger Cause TUESDAY		**5.67151**	0.0037	1.51803	0.2201	3.82205	0.0225	1.69485	0.1846	1.53024	0.2174
WEDNESDAY does not Granger Cause MONDAY	534	0.23201	0.793	3.12539	0.0447	0.8223	0.44	0.06986	0.9325	0.92424	0.3975
MONDAY does not Granger Cause WEDNESDAY		1.30558	0.2719	1.06487	0.3455	0.9208	0.3988	0.66556	0.5144	**4.5361**	0.0111
THURSDAY does not Granger Cause MONDAY	534	0.50543	0.6035	2.11332	0.1219	2.32363	0.0989	0.65899	0.5178	0.07942	0.9237
MONDAY does not Granger Cause THURSDAY		0.08631	0.9173	1.54402	0.2145	2.3565	0.0957	0.09706	0.9075	**4.40595**	0.0127
FRIDAY does not Granger Cause MONDAY	534	**4.01222**	0.0186	1.56935	0.2092	**5.95126**	0.0028	0.76075	0.4678	1.44221	0.2373
MONDAY does not Granger Cause FRIDAY		0.0633	0.9387	0.57057	0.5656	3.77254	0.0236	0.52961	0.5891	0.70591	0.4941
WEDNESDAY does not Granger Cause TUESDAY	534	0.87121	0.419	0.2069	0.8132	1.06461	0.3456	0.25318	0.7764	0.8465	0.4295
TUESDAY does not Granger Cause WEDNESDAY		**7.66363**	0.0005	3.03933	0.0487	1.25347	0.2864	0.29315	0.746	**4.75483**	0.009
THURSDAY does not Granger Cause TUESDAY	534	1.53119	0.2172	2.38761	0.0928	**6.10491**	0.0024	0.65596	0.5194	0.20253	0.8167
TUESDAY does not Granger Cause THURSDAY		0.73725	0.4789	0.73202	0.4814	2.57615	0.077	2.45271	0.087	0.17474	0.8397
FRIDAY does not Granger Cause TUESDAY	534	0.08481	0.9187	**4.5887**	0.0106	2.11148	0.1221	3.75669	0.024	1.4993	0.2242
TUESDAY does not Granger Cause FRIDAY		0.3805	0.6837	0.24614	0.7819	2.73117	0.0661	0.21247	0.8087	0.65528	0.5197
THURSDAY does not Granger Cause WEDNESDAY	534	0.18609	0.8302	0.9572	0.3846	1.9979	0.1366	1.25088	0.2871	0.30288	0.7388
WEDNESDAY does not Granger Cause THURSDAY		0.56269	0.57	0.1877	0.8289	**4.34629**	0.0134	2.02223	0.1334	0.85604	0.4254
FRIDAY does not Granger Cause WEDNESDAY	534	2.59291	0.0758	0.11821	0.8885	0.71878	0.4878	3.47701	0.0316	2.74703	0.065
WEDNESDAY does not Granger Cause FRIDAY		0.14483	0.8652	3.18714	0.0421	1.2215	0.2956	1.39963	0.2476	0.62721	0.5345
FRIDAY does not Granger Cause THURSDAY	534	1.01433	0.3634	1.2744	0.2805	**6.11133**	0.0024	1.79326	0.1674	0.1373	0.8717
THURSDAY does not Granger Cause FRIDAY		**5.40779**	0.0047	2.2292	0.1086	0.51283	0.5991	0.1708	0.843	2.68623	0.0691

Table 4.3 represents results of granger causality test which is performed to know whether any trading day "granger-causes" another trading day. Null hypothesis are displayed in above output. Null hypothesis can be rejected if f values are more than 3.84. From the above table it can be seen that if f ≥ 3.84, therefore alternative hypothesis is going to be accepted which means in case of reliance industries ltd. Monday granger cause with Tuesday, Friday granger cause with Monday, Tuesday granger cause with Wednesday and Thursday granger cause on Friday. In case of Tata Consultancy Ltd. in that Friday granger cause with Tuesday.
From the above table it can be seen that Larsen & Toubr Friday granger cause with Monday, Thursday granger cause with Tuesday, Wednesday granger cause with Thursday and Friday granger cause with Thursday. And in Bharti Airtel Ltd. Monday granger cause with Wednesday, Monday granger cause with Thursday and Tuesday does not granger cause Wednesday.
F- Statistics for all other days is less than 3.84 which leads to acceptance of Null Hypothesis.

CONCLUSION:

The present study focuses on day of the week effect on stock return and volatility: evidence from Indian stock market. The study is descriptive in nature and it attempts to examine the behaviour of stock prices of selected companies for selected duration. The data has been taken from secondary sources. The study has collected 534 observations in terms of daily returns for each company. The objectives of present study is to examine day of the week effect and anomaly in Indian Stock Market, to evaluate the stocks return with the help of day of the week effect and to investigate the existence of day of the week effect anomaly in Indian Stock Market.

The study uses the daily return data of the stock listed on index of Bombay Stock Exchange and National Stock Exchange to find the stock market anomaly. The returns from the stock were dependent on the different trading days so that the investors can take the advantage from these different strategies. Descriptive research design has been used. From that we reach the conclusion that overall high return on Wednesday. So that investors should invest on Wednesday to get high return. While considering overall result than more fluctuation was on Friday. So from that we can say that if investors take more risk than the possibility of getting high return.

Granger causality test and unit root test has been used for knowing the anomaly in stock market. The result of Augmented Dickey-Fuller Unit Root Test suggests that returns of selected companies from the duration of 2007 to 2017 do not contain a unit root and data series are stationery.

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