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Calendar Anomalies: an empirical study on the Day of the Week Effect in Indian Banking Sector

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Abstract: *Calendar Anomalies have long been part of market folklore. 'Studies of the day-of-the-week, holiday and January effects first began to appear in the 1930. And although academics have only recently begun seriously to examine these return patterns, they have found them to withstand close scrutiny. Calendar regularities generally occur at cusps in time—the turn of the year, the month, the week, the day. They often have significant economic impact. For instance, the "Blue 12 Monday" effect was so strong during the Great Depression that the entire market crash took place over weekends, from Saturday's close to Monday's close. The stock market actually rose on average every other day of the week. Calendar anomalies are often related to other return effects. For instance, some calendar anomalies are more potent for small than for large capitalization stocks. While analysis of cross-sectional effects requires fundamental databases—a relatively recent innovation—the study of calendar anomalies requires only time-dated records of market indexes. Hence calendar anomalies can be tracked historically for much longer periods than effects requiring fundamental data. The availability of a century of data brings enormous statistical power for testing calendar effects, but it also increases the likelihood of data-mining. If enough patterns are tested, some will appear significant merely by chance. In exploring calendar anomalies, therefore, significance levels must be properly adjusted for the number of hypotheses examined, out-of- sample tests should be encouraged, and only plausible hypotheses considered. There is enough evidence on market efficiency and day of the week effect in the developed markets; however, the same is not true for the emerging stock markets. This study provides empirical evidence on weak form efficiency and the day of the week effect in Bombay Stock Exchange over a period of 1st January 2003-30th March 2016. The results provide evidence of day of the week effect and that the stock market is not weak form efficient. The day of the week effect observed on the BSE pose interesting buy and hold strategy issues.*

Keywords*: Efficient Market Hypothesis(EMH), days of week effect, daily returns of stock*

I. INTRODUCTION

The growth in the amount of data and computing power available to researchers, along with the growth in the number of active empirical researchers in finance since Fama's (1970) paper has created an explosion of findings that raise questions about the efficient capital markets (Schweret,2002). A number of studies have reported time patterns in security returns, returns being higher or lower depending on the time of the day, the day of the week, and the month of the year. Many researchers working on these variables, and set of data, patterns have been found, and they are simply random. Some studies have explained that these patterns are partly induced by the market structure and order flows (Mishkin 2007). Markets are inefficient because one would expect that the patterns would disappear as investors exploit them, but due to transactional costs, the return differences are not large enough to develop a trading strategy to take advantage of them (Mishkin 2007). These findings are referred to as anomalies. In the non-investing world, an anomaly is a strange or unusual occurrence. In financial markets, anomalies refer to situations when a security or group of securities performs contrary to the notion of efficient markets, where security prices are said to reflect all available information at any point in time (investopedia.com).

Market Pricing Anomalies

Since the beginning of Efficient Market Hypothesis (EMH) was publicized, some researchers have found facts that violate the theory. The violation of the EMH is called the market pricing anomaly. Literary meaning of an anomaly is a strange or unusual occurrence. The word anomaly refers to scientific and technological matters. It has been defined by George & Elton (2001) as irregularity or a deviation from common or natural order or an exceptional condition. Anomaly is a term that is generic in nature and it applies to any fundamental novelty of fact, new and unexpected phenomenon or a surprise with regard to any theory, model or hypothesis (George & Elton 2001). Anomalies are the indicator of inefficient markets, some anomalies happen only once and vanish, while others happen frequently, or continuously (Tversky & Kahneman 1986) defined market anomalies as "an anomaly is a deviation from the presently accepted paradigms that is too widespread to be ignored, too systematic to be dismissed as 21 random error, and too fundamental to be accommodated by

relaxing the normative system". Market anomaly is the state that a market price cannot be related to the current information. G.W. Schwert (2003) stated that anomalies are empirical results that seem to be inconsistent with the asset pricing theory. The market anomalies can indicate of inefficiency in the market or fallacy in the asset-pricing model. Gary Karz (2010) divided the anomalies into four types: fundamental anomalies, technical anomalies, calendar anomalies, and other anomalies. This research will focus on calendar anomaly that is Monday Effect. Fama (1998), the developer of EMH also respond the EMH view of anomalies. Fama said that if anomalies split randomly between the under reaction and overreaction, it can be categorized as consistent with the efficient market. It is suggested that market efficiency should not be abandoned to the fact of the long-term anomalies. The long term anomalies are easily broken and tend to disappear with reasonable changes.

Calendar Anomalies

Calendar anomalies are related with particular time period i.e. movement in stock prices from day to day, month to month, year to year etc .these include weekend effect, turn of the month effect, year-end effect etc (Karz 2011).These phenomena have been referred to as anomalies because they cannot be explained within the existing paradigm of EMH.

Calendar anomalies	Description	Study conducted and article
***The Day of the Week Effect (Weekend Effect)*:**	The stock prices are likely to fall on Monday. Means the closing price of Monday is less than the closing price of previous Friday.	Smirlock & Starks (1986)
Turn-of-the-Month Effect:	The prices of stocks are likely to increase in the last trading day of the following month, and the first three days of next month.	Nosheen et al. (2007) Agrawal & Tandon (1994)
Turn-of-the-Year Effect	This anomaly describes the increase in the prices of stocks and trading volume of stock exchange in the last week of December and the first half month of January.	Agrawal & Tandon (1994
January Effect:	The phenomenon of small-company stocks to generate more return than other asset classes and market in the first two to three weeks of the January.	Keims (1983) Chatterjee & Manaiam

Technical Anomaly

"Technical Analysis" includes no. of analyzing techniques use to forecast future prices of stocks on the basis of past prices and relevant past information. Commonly technical analysis use techniques including strategies like resistance support, as well as moving averages. Many researchers like Bodie et al. (2007) have found that when the market holds weak form efficiency, then prices already reflected the past information and technical analysis is of no use. So the investor cannot beat the market by earning abnormal returns on the basis of technical analysis and past information. But here are some anomalies that deviate from the findings of these studies.

HYPOTHESIS RELATED TO DAY OF THE WEEK EFFECT

Many theories have been postulated to explain the day-of-the-week effect with the most popular ones is as follows:

1. Settlement Period Hypothesis:

The trading behavior for weekdays could be caused due to settlement cycles. This attributes seasonality across days of the week to the settlement dates with prices being higher on the pay-in days as compared to the pay-out days. This theory has been opposed by some as the anomaly holds across markets that have different settlement periods (varying from one day in France and Hong- Kong to six-flfteen days in the UK — Agrawal and Tandon, 1994). Also, Gibbons and Hess (1981), and Lakonishok and Levi (1982) studies have found that settlement effect cannot explain weekend effects.

II. INFORMATION FLOW HYPOTHESIS:

Penman (1987), and Dyl and Maberly (1988) propounded this theory which says that the difference in information flow over the weekend as compared to other days of the week causes the Monday Effect. Firms typically release good information during the weekdays and bad information after the weekend, to prevent investors from discounting bad news during holidays, causing the flrm's security prices be affected adversely on Monday, the first trading day of a week.

III. CALENDAR/TRADING TIME HYPOTHESIS:

Under the calendar time hypothesis, the process operates continuously and the expected returns for Monday should be three times the expected return for other days of the week because Monday returns are spread across three days. The observed negative Monday returns go against this intuitive reasoning and thus another

theory was proposed. Under the trading time hypothesis, returns are generated only during active trading and expected return should be the same for each day of the week. Rogalski (1984), Harris (1986), and Smirlock and Starks (1986) show that the negative returns over the weekend occurs during the non- trading period from Friday-close to Monday-opening and that Monday trading returns are actually positive. They also explained that the weekend effect is due to measurement error.

IV. RETAIL INVESTOR TRADING HYPOTHESIS:

Brooks and Kim (1997) suggest that negative Monday returns could be the result of individual investor trading activity. Using odd lot trades as proxy for individual investors, they found that trading activity is significantly lower on Monday for large size trades. Moreover, small size trades have a higher percentage of sell orders on Monday as compared to other days of the week. Similarly, Ritter (1988), and Lakonishok and Maberly (1990) argued that there are more buy orders on Fridays and more sell orders on Mondays by retail investors and individual trading is responsible for weekend effect

OBJECTIVES

The primary objective of the study is to investigate the existence of seasonality in stock price behavior in Indian stock market. The study of seasonality is segregated into analyzing and measuring the day of the week effect in banking sector.

The specific objectives of the study are:

- To present a panoramic view of the Indian Stock Market.
- To present the prior studies on stock price seasonality, both in national and international market.
- To analyze the basic descriptive statistics for daily return

SAMPLE, SOURCE AND THE PERIOD OF THE STUDY

In the study, we have taken 6 banks from the banking sector, namely Bank of Baroda, Canara Bank, HDFC Bank, ICICI Bank, IDBI Bankand State Bank of India (SBI) The period of the study is from 1st January 2003 to 30th March 2016. For the purpose of analysis, the study has employed daily price series that have been obtained from the official website of Bombay Stock Exchange (BSE)

V. RESEARCH METHODOLOGY

It is found from the extensive review of prior studies that most of the earlier works on the stock price have used Closing Pricing for return generating procedure with an implied assumption of trading done at the closing price. The Continuous Compounded Annual Return is well accepted approach to measure the daily returns. The natural log of daily relative mean index value is used as a measure to study daily returns of stocks of selected 6 banks for the purpose of this study. The log return is calculated based on the closing price and is presented in Equation 1.

$Rt = \ln (Ct / Ct-1)$ (1)

where

Rt = the return on Day t

Ct = Closing Price on Day t

Ct-1 = Closing Price on Day t-1

ln = Natural Log

The study has analyzed the returns on daily basis. In the first phase, we employ basic descriptive statistics like mean, median, standard deviation, kurtosis and skewness. In the last phase, the study used multiple regression technique to examine the significance of the regression coefficient for investigating day of week effects.

Observation Bank of Baroda

Statistics

		Monday	Tuesday	Wednesday	Thursday	Friday	Total
N	Valid	660	663	660	650	646	3300
	Missing	2640	2637	2640	2650	2654	0
Mean		.0006361462	-.000298904	.0025670975	-.002318686	.0001264134	.0001981199
Std. Error of Mean		.0012246292	.0010771227	.0010649474	.0027192187	.0011006356	.0006971416
Median		.0012688890	-.000736920	.0007220845	-.000305882	-.000410388	.0000731500
Mode		.0000000000	.0000000000	-.089142837[a]	.0000000000	-.218618657[a]	.0000000000
Std. Deviation		.0314612936	.0277346035	.0273589929	.0693267467	.0279743370	.0400477359
Variance		.001	.001	.001	.005	.001	.002
Skewness		.119	.593	.650	-19.482	-.791	-19.888
Std. Error of Skewness		.095	.095	.095	.096	.096	.043
Kurtosis		10.127	4.826	3.145	454.675	6.565	806.674
Std. Error of Kurtosis		.190	.190	.190	.191	.192	.085
Range		.4365829660	.2899044650	.2520907950	1.773501357	.3137576190	1.816072292
Minimum		-.237423926	-.100156764	-.089142837	-1.61691325	-.218618657	-1.61691325
Maximum		.1991590400	.1897477010	.1629479580	.1565881050	.0951389620	.1991590400
Sum		.4198564760	-.198173461	1.694284365	-1.50714611	.0816630350	.6537957350

a. Multiple modes exist. The smallest value is shown

Descriptive statistics were computed of returns of Bank of Baroda Share Price. The results are reported in the above Table, which show the mean returns of Bank of Baroda stock for the period 1st January 2003 and 30th March 2016. The table depicts the values of descriptive statistics for each of the week days for the selected bank. The table depicts negative mean returns for Tuesday and Thursday, and positive mean returns for Monday, Wednesday and Friday. The standard error of mean on stationary log returns ranges from 0.0010771227 to 0.0027192187. With regard to median, it is observed that relatively higher value of median returns (in consistent manner) is for Monday and Wednesday. The median descriptive reflects a probability of high statistical aberration instead of a calendar effect. It reflects conflicting negative returns on Thursday and Friday and significantly high positive median value on Monday. A need is identified on the basis of mean and median descriptive for Bank of Baroda log value return on stock to further explore e un of the week effect on more banks before turning into a logical rationale. The standard deviation and variance results were seen significantly high for Thursday overall. Lesser variance was observed on turn of the week effect. This is significantly because of availability of information and predictive stock market price rationality been observed in market. It has been observed that closing weekdays, i.e. Thursday and Friday have negatively skewed log returns on closing price of Bank of Baroda stock with values -19.482 and -0.791 respectively, whereas Monday, Tuesday and Wednesday reflects positively skewed log normal returns on closing price with values 10.127, 4.826 and 3.145 respectively. The test of normality showed that log normal returns on Monday and Friday are very slightly correlated and the relationship between the two groups is negative. The Kolmogorov-Smirnov test confirms this suspicion (p = 0.077 and p = 0.054). Conducting an ln-transformation on the two variables fixes the problem and establishes normality (Shapiro Wilk test p = .897 and p = .948). In this simple case, we need to just add the variables Friday dummy and Monday dummy to the model as dependent and independent variables.

The field statistics allowed us to include additional statistics that we need to assess the validity of our linear regression analysis. A need was identified to additionally include the collinearity diagnostics and the Durbin-Watson test for auto-correlation. To test the assumption of homoscedasticity of residuals

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.012[a]	.000	-.001	.0279939815	.000	.095	1	644	.758	1.969

a. Predictors: (Constant), Monday

b. Dependent Variable: Friday

The output's first table shows the model summary and overall fit statistics. We find that the adjusted R^2 of our model is 0.000 with the R^2 = .000 that means that the linear regression explains 0 % of the variance in the data. The Durbin-Watson d = 1.969, which is between the two critical values of 1.5 < d < 2.5 and therefore we can assume that there is no first order linear auto-correlation in the data.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.000	1	.000	.095	.758[b]
	Residual	.505	644	.001		
	Total	.505	645			

a. Dependent Variable: Friday

b. Predictors: (Constant), Monday

The next table is the F-test, the linear regression's F-test has the null hypothesis that there is no linear relationship between the two variables (in other words R^2=0). With F = 0.095 and 645 degrees of freedom the test is highly insignificant, thus we can assume that there is no linear relationship between the variables in our model.

Canara bank

Statistics

		Monday	Tuesday	Wednesday	Thursday	Friday	Total
N	Valid	661	663	660	658	654	3300
	Missing	2639	2637	2640	2642	2646	0
Mean		-.000932874	-.001178315	.0017132953	.0000319044	.0023572402	.0004021755
Std. Error of Mean		.0011140181	.0009119306	.0010982145	.0012235430	.0013187467	.0005102483
Median		-.000622859	-.000465918	.0021571675	-.000888700	.0009608815	.0001434960
Mode		-.145358579[a]	-.090365350[a]	.0000000000	.0000000000	.0000000000	.0000000000
Std. Deviation		.0286413167	.0234811051	.0282136425	.0313857251	.0337248682	.0293115353
Variance		.001	.001	.001	.001	.001	.001
Skewness		.162	.177	-.220	.170	-.086	.047
Std. Error of Skewness		.095	.095	.095	.095	.096	.043
Kurtosis		2.490	.945	2.936	2.735	3.310	2.999
Std. Error of Kurtosis		.190	.190	.190	.190	.191	.085
Range		.2712528990	.1820266220	.2883243930	.2833847400	.3113084150	.3293494920
Minimum		-.145358579	-.090365350	-.159225171	-.120224655	-.166189407	-.166189407
Maximum		.1258943200	.0916612720	.1290992220	.1631600850	.1451190080	.1631600850
Sum		-.616629471	-.781222857	1.130774926	.0209930630	1.541635075	1.327179231

a. Multiple modes exist. The smallest value is shown

Next, we computed descriptive statistics of returns of Canara Bank Share Price. The results are reported in the above Table, which show the mean returns of Canara Bank stock for the period 1st January 2003 and 30th March 2016. The table depicts the values of descriptive statistics for each of the week days for the selected bank. The table depicts negative mean returns for Monday and Tuesday, and positive mean returns for Wednesday, Thursday and Friday. The standard error of mean on stationary log returns ranges from 0.0005102483 to 0.0013187467. With regard to median, it is observed that relatively higher value of median returns (in consistent manner) is for Wednesday, Thursday and Friday. The median and mean descriptive reflects a calendar effect. It reflects negative returns on Monday and Tuesday and significantly high positive median value on opening weekdays. A need is identified on the basis of mean and median descriptive for Canara Bank log value return on stock to further explore the day of the week effect on more banks before turning into a logical rationale. The standard deviation and variance results were seen significantly high for Thursday and Friday overall. Lesser variance was observed on turn of the week effect. This is significantly because of availability of information and predictive stock market price rationality been observed in market.

It has been observed that closing weekdays, i.e. Wednesday and Friday have negatively skewed log returns on closing price of Canara Bank stock with values –0.220 and -0.086 respectively, whereas Monday, Tuesday and Thursday reflects positively skewed log normal returns on closing price with values 0.162, 0.177 and 0.170 respectively. The test of normality showed that log normal returns on Monday and Friday are very highly correlated and the relationship between the two groups is positive. In this simple case, we need to just add the variables Friday dummy and Monday dummy to the model as dependent and independent variables. The field statistics allowed us to include additional statistics that we need to assess the validity of our linear regression analysis.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.021[a]	.000	-.001	.0337429595	.000	.300	1	652	.584	2.018

a. Predictors: (Constant), Monday

b. Dependent Variable: Friday

The output's first table shows the model summary and overall fit statistics. We find that the adjusted R^2 of our model is 0.000 with the R^2 = .000 that means that the linear regression explains 0 % of the variance in the data. The Durbin-Watson d = 2.018, which is between the two critical values of $1.5 < d < 2.5$ and therefore we can assume that there is no first order linear auto-correlation in the data.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.000	1	.000	.300	.584[b]
	Residual	.742	652	.001		
	Total	.743	653			

a.DependentVariable:Friday
b.Predictors:(Constant)Monday

The next table is the F-test, the linear regression's F-test has the null hypothesis that there is no linear relationship between the two variables (in other words $R^2=0$). With F = 0.300 and 653 degrees of freedom the test is insignificant, thus we can assume that there is no linear relationship between the variables in our model. But since the value of F is remarkable at 0.300, the occurrence of anomaly behavior is not due to mere statistical aberrations.

HDFC Bank

Statistics

		Monday	Tuesday	Wednesday	Thursday	Friday	Total
N	Valid	660	663	660	650	646	3300
	Missing	2640	2637	2640	2650	2654	0
Mean		.0008019874	.0014657744	.0016711121	-.001784882	.0001852828	.0004792402
Std. Error of Mean		.0007197462	.0005877898	.0008439057	.0026198422	.0008931591	.0006004494
Median		-.000235000	.0003900000	.0012260000	.0002750000	-.000420000	.0002750000
Mode		-.006870000[a]	-.001430000	-.024410000[a]	-.002810000[a]	-.035110000[a]	.0000000000
Std. Deviation		.0184906157	.0151348737	.0216803291	.0667931323	.0227010048	.0344931904
Variance		.000	.000	.000	.004	.001	.001
Skewness		.559	.331	.236	-21.313	-.014	-30.469
Std. Error of Skewness		.095	.095	.095	.096	.096	.043
Kurtosis		3.115	1.345	38.023	511.904	2.693	1420.353
Std. Error of Kurtosis		.190	.190	.190	.191	.192	.085
Range		.1657760000	.1092870000	.4499480000	1.723902000	.2140310000	1.822858000
Minimum		-.063150000	-.051660000	-.231040000	-1.60395000	-.119480000	-1.60395000
Maximum		.1026260000	.0576270000	.2189080000	.1199520000	.0945510000	.2189080000
Sum		.5293117000	.9718084000	1.102934000	-1.16017330	.1196927000	1.581492500

a. Multiple modes exist. The smallest value is shown

Next, we computed descriptive statistics of returns of HDFC Bank Share Price. The results are reported in the above Table, which show the mean returns of Bank of Baroda stock for the period 1st January 2003 and 30th March 2016. The table depicts the values of descriptive statistics for each of the week days for the selected bank. The table depicts negative mean returns for Monday, Thursday and Friday, and positive mean returns for Tuesday and Wednesday. The standard error of mean on stationary log returns ranges from 0.0005877898 to 0.0026198422. With regard to median, it is observed that relatively higher value of median returns (in consistent manner) is for Wednesday and Thursday. The median descriptive reflects the presence of day of the week effect. It reflects conflicting higher negative returns on Friday and significantly lower negative median value on Monday. A need is identified on the basis of mean and median descriptive for HDFC Bank log value return on stock to further explore day of the week effect on more banks before turning into a logical rationale. The standard deviation and variance results were seen significantly high for Thursday overall. Lesser variance was observed on turn of the week effect. This is significantly because of availability of information and predictive stock market price rationality been observed in market. It has been observed that closing weekdays, i.e. Thursday and Friday have negatively skewed log returns on closing price of Bank of Baroda stock with values -21.313 and -0.014 respectively, whereas Monday, Tuesday and Wednesday reflects positively skewed log normal returns on closing price with values 0.559, 0.331 and 0.236 respectively. The Kolmogorov-Smirnov test confirms this suspicion. The data was not normal before standardization process. ($p = 0.050$ and $p = 0.056$). Conducting an ln-transformation on the two variables fixes the problem and establishes normality (Shapiro Wilk test $p = .974$ and $p = .960$).

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Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.022[a]	.000	-.001	.0227133529	.000	.299	1	644	.585	2.156

a. Predictors: (Constant), Monday

b. Dependent Variable: Friday

The output's first table shows the model summary and overall fit statistics. We find that the adjusted R^2 of our model is -0.001 with the $R^2 = .000$ that means that the linear regression explains 0 % of the variance in the data. The Durbin-Watson $d = 2.156$, which is between the two critical values of $1.5 < d < 2.5$ and therefore we can assume that there is no first order linear auto-correlation in the data

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.000	1	.000	.299	.585[b]
	Residual	.332	644	.001		
	Total	.332	645			

a. Dependent Variable: Friday

b. Predictors: (Constant), Monday

The next table is the F-test, the linear regression's F-test has the null hypothesis that there is no linear relationship between the two variables (in other words $R^2=0$). With F = 0.299 and 645 degrees of freedom the test is highly insignificant, thus we can assume that there is no linear relationship between the variables in our model.

IDBI Bank

Statistics

		Monday	Tuesday	Wednesday	Thursday	Friday	Total
N	Valid	660	663	660	650	646	3300
	Missing	2640	2637	2640	2650	2654	0
Mean		-.000076435	-.001175463	.0008763833	-.000363478	.0026287090	.0003610230
Std. Error of Mean		.0011100435	.0008028191	.0012660523	.0013811269	.0015863261	.0005578759
Median		.0000000000	-.000580000	.0001945000	.0010400000	.0000000000	.0000000000
Mode		.0000000000	.0000000000	-.025290000[a]	.0000000000	.0000000000	.0000000000
Std. Deviation		.0285175326	.0206716181	.0325254731	.0352119658	.0403189045	.0320475326
Variance		.001	.000	.001	.001	.002	.001
Skewness		.078	-.080	.494	-.585	.364	.140
Std. Error of Skewness		.095	.095	.095	.096	.096	.043
Kurtosis		4.334	.046	2.936	4.575	5.569	5.681
Std. Error of Kurtosis		.190	.190	.190	.191	.192	.085
Range		.3151310000	.1376570000	.2973340000	.3770950000	.4042320000	.4092720000
Minimum		-.160500000	-.071740000	-.126240000	-.226950000	-.221910000	-.226950000
Maximum		.1546310000	.0659170000	.1710940000	.1501450000	.1823220000	.1823220000
Sum		-.050447000	-.779332000	.5784130000	-.236261000	1.698146000	1.191376000

a. Multiple modes exist. The smallest value is shown

Next, we computed descriptive statistics of returns of IDBI Bank Share Price. The results are reported in the above Table, which show the mean returns of IDBI Bank stock for the period 1st January 2003 and 30th March 2016. The table depicts the values of descriptive statistics for each of the week days for the selected bank. The table depicts negative mean returns for Monday and Thursday, and positive mean returns for Tuesday, Wednesday and Friday. The standard error of mean on stationary log returns ranges from 0.0005578759 to 0.0015863261. With regard to median, it is observed that relatively higher value of median returns (in consistent manner) is for Wednesday and Thursday. The standard deviation and variance results were seen significantly high for Friday overall. Lesser variance was observed on turn of the week effect. This is significantly because of availability of information and predictive stock market price rationality been observed in market. It has been observed that Thursdays have negatively skewed log returns on closing price of IDBI Bank stock with value -0.585. The Kolmogorov-Smirnov test confirms this suspicion. The data was not normal before standardization process. (p = 0.050 and p = 0.056). Conducting an ln-transformation on the two variables fixes the problem and establishes normality (Shapiro Wilk test p = .974 and p = .960).

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.001	1	.001	.501	.479[b]
	Residual	1.048	644	.002		
	Total	1.049	645			

a. Dependent Variable: Friday

b. Predictors: (Constant), Monday

The next table is the F-test, the linear regression's F-test has the null hypothesis that there is no linear relationship between the two variables (in other words $R^2=0$). With F = 0.501 and 645 degrees of freedom the test is highly insignificant, thus we can assume that there is no linear relationship between the variables in our model. But since the value of F is remarkable at 0.501, the occurrence of anomaly behavior is not due mere statistical aberrations.

ICICI BANK

Statistics

		Monday	Tuesday	Wednesday	Thursday	Friday	Total
N	Valid	660	663	660	650	646	3300
	Missing	2640	2637	2640	2650	2654	0
Mean		-.002162977	-.000231584	.0004108038	.0008569512	.0018863034	.0001588838
Std. Error of Mean		.0025588591	.0007843166	.0014824943	.0009871927	.0009192525	.0006675545
Median		-.000440000	-.000310000	.0013580000	.0008465000	.0007945000	.0001595000
Mode		-.001290000[a]	-.020020000[a]	-.081150000[a]	-.042170000[a]	.0000000000	.0000000000
Std. Deviation		.0657382801	.0201952003	.0380859674	.0251685740	.0233642081	.0383480845
Variance		.004	.000	.001	.001	.001	.001
Skewness		-21.853	.223	-.107	-.229	.277	-22.042
Std. Error of Skewness		.095	.095	.095	.096	.096	.043
Kurtosis		532.141	.651	4.162	2.603	3.196	920.609
Std. Error of Kurtosis		.190	.190	.190	.191	.192	.085
Range		1.688484000	.1315340000	.4266920000	.2538040000	.2310740000	1.807592000
Minimum		-1.60047000	-.057760000	-.219570000	-.147980000	-.104520000	-1.60047000
Maximum		.0880140000	.0737740000	.2071220000	.1058240000	.1265540000	.2071220000
Sum		-1.42756500	-.153540100	.2711305000	.5570183000	1.218552000	.5243167000

a. Multiple modes exist. The smallest value is shown

Next, we computed descriptive statistics of returns of ICICI Bank Share Price. The results are reported in the above Table, which show the mean returns of ICICI stock for the period 1st January 2003 and 30th March 2016. The table depicts the values of descriptive statistics for each of the week days for the selected bank. The table depicts negative mean returns for Monday and Tuesday, and positive mean returns for Wednesday, Thursday and Friday. The standard error of mean on stationary log returns ranges from 0.000667 to 0.002558. With regard to median, it is observed that relatively higher value of median returns (in consistent manner) Wednesday. The standard deviation and variance results were seen significantly high for Wednesday overall. Lesser variance was observed on turn of the week effect. This is significantly because of availability of information and predictive stock market price rationality been observed in market. It has been observed that Monday, Wednesday and Thursday have negatively skewed log returns on closing price of ICICI Bank stock with values -21.853, -0.107 and -0.229 respectively.

The Kolmogorov-Smirnov test confirms this suspicion. The data was not normal before standardization process. (p = 0.050 and p = 0.056). Conducting an ln-transformation on the two variables fixes the problem and establishes normality (Shapiro Wilk test p = .974 and p = .960). In this simple case, we need to just add the variables Friday dummy and Monday dummy to the model as dependent and independent variables. The field statistics allowed us to include additional statistics that we need to assess the validity of our linear regression analysis. A need was identified to additionally include the collinearity diagnostics and the Durbin-Watson test for auto-correlation. To test the assumption of homoscedasticity of residuals, we also include a special plot in the Plots menu.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.000[a]	.000	-.002	.0233823405	.000	.000	1	644	.996	2.119

a. Predictors: (Constant), Monday

b. Dependent Variable: Friday

The output's first table shows the model summary and overall fit statistics. We find that the adjusted R^2 of our model is 0.000 with the R^2 = .000 that means that the linear regression explains 0 % of the variance in the data. The Durbin-Watson d = .119, which is between the two critical values of $1.5 < d < 2.5$ and therefore we can assume that there is no first order linear auto-correlation in the data.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.000	1	.000	.000	.996[b]
	Residual	.352	644	.001		
	Total	.352	645			

a. Dependent Variable: Friday

b. Predictors: (Constant), Monday

The next table is the F-test, the linear regression's F-test has the null hypothesis that there is no linear relationship between the two variables (in other words $R^2=0$). With F = 0.000 and 645 degrees of freedom the test is highly insignificant, thus we can assume that there is no linear relationship between the variables in our model. But since the value of F=0, the occurrence of anomaly behavior is just due to mere statistical aberrations.

STATE BANK OF INDIA

Statistics

		Monday	Tuesday	Wednesday	Thursday	Friday	Total
N	Valid	661	664	661	651	667	3300
	Missing	2639	2636	2639	2649	2633	0
Mean		-.003095403	-.000868017	.0012750179	.0003150952	.0026004123	.0000484740
Std. Error of Mean		.0025670494	.0007803373	.0010405886	.0010174149	.0013987976	.0006732779
Median		-.000480000	-.000855000	.0008380000	-.000220000	.0011250000	.0001630000
Mode		-.018710000[a]	-.001720000	-.024270000[a]	.0000000000	.0000000000	.0000000000
Std. Deviation		.0659986344	.0201078854	.0267534495	.0259590379	.0361258261	.0386768705
Variance		.004	.000	.001	.001	.001	.001
Skewness		-20.314	-.015	-.129	-.005	-.321	-20.306
Std. Error of Skewness		.095	.095	.095	.096	.095	.043
Kurtosis		482.572	1.314	2.510	1.835	4.673	822.966
Std. Error of Kurtosis		.190	.189	.190	.191	.189	.085
Range		1.669955000	.1608300000	.2377350000	.1974710000	.3891760000	1.736006000
Minimum		-1.56976000	-.071230000	-.120000000	-.101480000	-.222930000	-1.56976000
Maximum		.1001950000	.0896000000	.1177350000	.0959910000	.1662460000	.1662460000
Sum		-2.04606160	-.576363000	.8427868000	.2051270000	1.734475000	.1599642000

a. Multiple modes exist. The smallest value is shown

Next, we computed descriptive statistics of returns of SBI Share Price. The results are reported in the above Table, which show the mean returns of SBI stock for the period 1st January 2003 and 30th March 2016. The table depicts the values of descriptive statistics for each of the week days for the selected bank. The table depicts negative mean returns for Monday and Tuesday, and positive mean returns for Wednesday, Thursday and Friday. The standard error of mean on stationary log returns ranges from 0.0007803373 to 0.0025670494. With regard to median, it is observed that relatively higher value of median returns (in consistent manner) is for Wednesday and Friday. The standard deviation and variance results were seen significantly high for Monday overall. Lesser variance was observed on turn of the week effect. The Kolmogorov-Smirnov test confirms this suspicion. The data was not normal before standardization process. (p = 0.050 and p = 0.056). Conducting an ln-transformation on the two variables fixes the problem and establishes normality (Shapiro Wilk test p = .974 and p = .960). In this simple case, we need to just add the variables Friday dummy and Monday dummy to the model as dependent and independent variables. The field statistics allowed us to include additional statistics that we need to assess the validity of our linear regression analysis. A need was identified to additionally include the collinearity diagnostics and the Durbin-Watson test for auto-correlation. To test the assumption of homoscedasticity of residuals, we also include a special plot in the Plots menu.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.002	1	.002	1.744	.187[b]
	Residual	.848	659	.001		
	Total	.850	660			

a. Dependent Variable: Friday

b. Predictors: (Constant), Monday

The next table is the F-test, the linear regression's F-test has the null hypothesis that there is no linear relationship between the two variables (in other words $R^2=0$). With F = 1.744 and 660 degrees of freedom the test is highly insignificant, thus we can assume that there is no linear relationship between the variables in our model.

VI. CONCLUSION

In this study, we tried to examine the seasonality of stock market in India. We considered 6 service banks as the representative of banking sector in the stock market in India and tested whether seasonality are present in bank market share returns using daily data sets. The results established that the Indian stock market is not efficient and investors can improve their returns by timing their investment. Many studies on stock market prices have been based on the belief that returns are not influenced by the day of the week. However, we believe that the daily observed stock returns should depend on the day of the week and that there is requirement for adjustment for interest gains on certain days because of the effects of market sentiments and the settlement cycle. Our results suggest that future examinations of the stock market of the period from 1st January 2003 – 30th March 2016 will have residual daily effects, even after the adjustments that are the unexplained part of the weekend effect. This could potentially influence conclusions and raise questions about market efficiency. Our results, however, are able to explain partially what might be some of the reasons for the weekend effect. Whatever these tests show, they cannot ignore the institutional necessity of making adjustments for settlement lags and other effects when using data on daily returns, since it would be difficult to accept that investors would ignore two days of interest. And as we have demonstrated in this short paper, while not sufficient to explain the magnitude of the weekend effect, the required interest adjustment has a magnitude of some relevance.

It is clearly evident from analysis that in case of every bank where any weekday effect is confirmed, Monday effect is there. Monday effect is confirmed in case of 4 out of 6 banks. Monday-Tuesday relationship was also observed for some banks. In total, 2 banks (viz. Bank of Baroda, HDFC Bank) did not manifest day-of-the-week effect. Monday is the day when stock market gets opened after a two days long holiday. Therefore any good or bad information (company related, industry specific, economic, political, national or international) affects significantly the returns earned on Monday. But there are chances of earning excess returns on Monday due to some other reasons also which is left for future research.

MARKET ADVICE

Some interesting findings that have emerged from empirical research on the behavior of asset prices and discusses the implications of these findings for the way academics and practitioners use financial theory. In the process, I have replicated and extended some puzzling findings that have been called anomalies because they do not conform to the predictions of accepted models of asset pricing. One of the interesting findings from the empirical work in this chapter is that the weekend effect and the dividend yield effect also seem to have lost their predictive power after the papers that made them famous were published. In these cases, however, I am not aware of any practitioners who have tried to use these anomalies as a major basis of their investment strategy.
Likewise, the evidence that stock market returns are predictable using variables such as dividend yields or inflation is much weaker in the periods after the papers that documented these findings were published. All of these findings raise the possibility that anomalies are more apparent than real. The notoriety associated with the findings of unusual evidence tempts authors to further investigate puzzling anomalies and later to try to explain them. But even if the anomalies existed in the sample period in which they were first identified, the activities of practitioners who implement strategies to take advantage of anomalous behavior can cause the anomalies to disappear (as research findings cause the market to become more efficient). Much of the literature studying long-horizon returns focuses on corporate financial policy decisions such as IPOs, seasoned equity offerings, share repurchases, merger bids, and so forth. A common theme in this literature is that there is a slow drift in the stock price of the firm after the event, apparently reflecting a gradual process of learning the good or bad news associated with the event. A slow reaction is inconsistent with the efficient markets hypothesis. As mentioned above, the papers that have systematically studied the behavior of long-horizon performance measures found that they have low power and unreliable statistical properties in most situations.

Although the paper points out at fading turn of the week effect in case of Indian Stock Market, still on the basis of trend analysis and descriptive statistics of the selected nine banks over a time period of more than 13 years, a generalized investment strategy can be postulated which rationalized investors can consider to time their investments in order to accrue significantly better results.

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