VOLATILITY OF INDIAN STOCK MARKETS – AN ANALYTICAL STUDY (WITH SPECIAL REFERENCE TO POWER, CAPITAL GOODS AND TECHNOLOGY SECTORS)

Dr. N. Srividhya,

Professor, SriManakula Vinayagar Engineering College, Madagadipet, Puducherry.

Introduction

In a global economy, there are plenty of opportunities to invest outside of North America and Europe. Asia, in particular, offers a host of opportunities. Also, it is home to robust financial markets representing trillions of dollars. Any market that large is bound to offer some interesting investment opportunities. Emerging markets like India are fast becoming engines for future growth. The regions of Asia are divided into developed and developing economies. The highly developed countries include Japan and the four countries often referred to as the Asian Tigers - Hong Kong, Singapore, South Korea and Taiwan. Major players among the other powerhouses include Russia, China, India and Malaysia. These other nations are major economic forces, but academics often debate whether or not they can be classified as "developed". Malaysia, for example, is a major source of scientific innovations, yet fails to be fully recognized as a developed nation.

Stock market Volatility

Volatility is a measure for variation of price of a financial instrument over time. Historic volatility is derived from time series of past market prices. The symbol σ is used for volatility, and corresponds to standard deviation, which should not be confused with the similarly named variance, which is instead the square, σ^2. Volatility is up-and-down movement of the market. It's usually measured by the standard deviation from the expectation. If you look at a day, the movement is typically up, but not by very much. Any movement up or down from its expectation is the volatility. Historically, the volatility of the stock market is roughly 20% a year and 5.8% a month, but volatility keeps on changing, so we go through periods of high volatility and low volatility. The biggest driver of volatility is a drop in the market. There are simple leverage

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE- International Journal of Management Research (GE-IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 209

reasons why market drops cause volatility. But beyond that simple mechanism, following a drop in the market, volatility typically shoots way up for a time before it dampens down again.

The study of volatility becomes more important due to the growing linkages of national markets in currency commodity and stock with rest of the world markets and existence of common players have given volatility a new property- that of its speedy transmissibility across markets.

The Day of the week effect

The *weekend effect* (also known as the *Monday effect*, the *day-of-the-week* effect or the *Monday seasonal*) 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. Efficient market supporters hate the Days of the Week anomaly because it not only appears to be true; it makes no sense. Research has shown that stocks tend to move more on Fridays than Mondays, and that there is a bias toward positive market performance on Fridays. It is not a huge discrepancy, but it is a persistent one.

Objectives of the study

a. To determine the stock market returns and volatility for 3 emerging sectors capital goods, power, and technology for the period 2010 to 2014.

b. To investigate the presence of the day of the week returns and the correlation of such returns in these three sectors.

c. To determine the extent of relationship prevalent in the three sectorals indices.

In this study of stock market returns and volatility for 3 emerging sectors where stock market index will be analyzed. The independent variable is stock market index. The study is to explain that its sense for the country to convergence for each other benefit. The stock market volatility of 3 emerging sectors in Indian country, the sources of data are obtain by using the secondary data on monthly basis for the period of five years from 2010 to 2014.

Data Collection

The daily closing prices of 3 emerging sectors namely Capital Goods, Power, Technology were taken from,

➢ BSE Power

➢ BSE Capital Goods

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE– International Journal of Management Research (GE-IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 210

➢ BSE Technology

The top ten volume toppers are taken from these three sectors. The top ten volume toppers are,

S.No	BSE Power	BSE Capital Goods	BSE TECHNOLOGY
1	Adani Power	BEL	Airtel
2	BHEL	BHEL	HCL
3	Crompton Greaves	BMEL	Idea
4	GMR Infra	Crompton Greaves	Infosys
5	JSW Energy	Havells	Inox
6	Reliance Infra	L&T	Just Dial
7	Reliance Power	PipavavDoc	Reliance Communication
8	Seimens	Seimens	TCS
9	Suzlon Energy	Suzlon Energy	Tech Mahindra
10	Torrent Power	Wabag Tech	Wipro

The data were collected from these indexes for the period of 2010 to 2014

Statistical Tools

The daily closing price of 3 emerging sectors for the period 2010 to 2014 data were coded and fed in to the Microsoft excel template to analyze and to calculate the daily returns. The tools used for this study are SPSS and the findings obtained from the analysis were duly interpreted and conclusions were drawn accordingly.

(1) Daily Returns

For this study, the daily stock returns for these global stock indices are calculated as follows,

$\ln(Pt/Pt-1)*100$

Where Pt is the stock index at date t. Except for the returns on Monday, any returns that are preceded by a holiday were excluded

(2) Kruskal-Wallis Test

The normality test indicates that the distributions of the returns are mostly non normal, the non-parametric test Kruskal-Wallis is used to check the results for equality of mean returns.

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE- International Journal of Management Research (GE-IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 211

The Kruskal-Wallis statistic is as follows,

$$K = \frac{12}{N(N+1)} \sum_{i=1}^{g} n_i \left(\bar{r}_{i\cdot} - \frac{N+1}{2} \right)^2$$

$$= \frac{12}{N(N+1)} \sum_{i=1}^{g} n_i \bar{r}_{i\cdot}^2 - 3(N+1).$$

Where k = number of samples, nj = number of values in jth sample, N = Σnj = total number of values, Rj = sum of ranks in the sample when N values are ranked together.

The Kruskal-Wallis test is a nonparametric test used to compare three or more samples. It is used to test the null hypothesis that all populations have identical distribution functions against the alternative hypothesis that at least two of the samples differ only with respect to location (median), if at all.

(3) Levene's Statistics

The Levene's test uses the average of the absolute deviations instead of the mean square deviations. This avoidance of squaring makes the test criterion much less sensitive to nonnormal distributions. The one-way analysis of variance (ANOVA) is used to determine whether there are any significant differences between the means of three or more independent (unrelated) groups.

The one-way ANOVA compares the means between the groups you are interested in and determines whether any of those means are significantly different from each other.

Specifically, it tests the null hypothesis:

$$H_O: \mu_1 = \mu_2 = \mu_3 = \cdots = \mu_k$$

Where μ = group mean and k = number of groups. If, however, the one-way ANOVA returns a significant result, we accept the alternative hypothesis (H_A), which is that there are at least 2 group means that are significantly different from each other.

(4) W Test

The **Shapiro–Wilk test** is a test of normality in frequent statistics. An assessment of the normality of data is a prerequisite for many statistical tests because normal data is an underlying assumption in parametric testing. There are two main methods of assessing normality: graphically and numerically.

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE– International Journal of Management Research (GE–IJMR)
Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 212

(5) Correlation of Returns

Pearson's correlation coefficient between two variables is defined as the covariance of the two variables divided by the product of their standard deviations. The form of the definition involves a product moment that is, the mean (the first moment about the origin) of the product of the mean-adjusted random variables hence the modifier product-moment in the name. Pearson correlation is,

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[\,n\Sigma x^2 - (\Sigma x)^2\,][\,n\Sigma y^2 - (\Sigma y)^2\,]}}$$

Where x and y are sample means and Sx and Sy are the sample standard deviations of X and Y and the sum is from I = 1 to n.

(6) Regression

A statistical measure that attempts to determine the strength of the relationship between one dependent variable (usually denoted by Y) and a series of other changing variables (known as independent variables).

Linear Regression: $Y = a + bX + u$

Where:

Y= the variable that we are trying to predict X= the variable that we are using to predict Y a= the intercept b= the slope u = regression residual.

Daily Return Patterns

Daily stock returns are obtained by taking the logarithmic difference of the daily stock index times. With respect to monthly data, the stock indexes are measured by the last trading day of each month. Below Table shows the daily returns of 3 emerging sectors namely power, capital goods, technology.

Descriptive statistics of daily sectorals returns

Sectors	Mean	Standard Deviation
Power	0.0945	0.891
Capital goods	0.0512	0.06925
Technology	-0.05554	0.07999

Source: Secondary data

The above table shows the statistics including mean returns, standard deviation. Under different measures of frequency, Power sector has the highest mean return among the three different

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE- International Journal of Management Research (GE-IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 213

sectors, followed by Capital Goods, while Technology has the lowest one. In most cases higher average returns appear to match higher volatility

POWER SECTOR

Power Sector daily returns for the period 2010 - 2014

Company	Monday	Tuesday	Wednesday	Thursday	Friday
Adani Power	0.3335	0.3437	0.3643	0.3817	0.3631
BHEL	0.9014	0.8935	0.9102	0.9199	0.928
Crompton Greaves	0.3442	0.3381	0.3485	0.3547	0.3419
GMR Infra	0.5482	0.5604	0.5743	0.5752	0.5765
JSW Energy	0.0047	0.0387	0.0387	0.0789	0.0446
Reliance Infra	0.3338	0.3389	0.3381	0.3435	0.3501
Reliance Power	0.3699	0.3824	0.3893	0.3903	0.3949
Seimens	-0.1599	-0.1682	-0.1743	-0.1375	-0.1239
Suzlon Energy	0.7719	0.761	0.7602	0.8054	0.8003
Torrent Power	0.2673	0.2754	0.2781	0.2243	0.2659

Source: Secondary data

Under different measures of frequency, BHEL company has the highest return among the volume toppers, followed by Suzlon Energy, GMR Infrastructure, Adani power while JSW Energy, Seimens has the lowest one. In most cases average returns appear to match higher volatility.

Table : Power sector Over all return for the period 2010 to 2014

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Return	0.3715	0.3763	0.3827	0.3936	0.3941

Source: Secondary data

On comparing the day wise return in the power sector Thursday return (0.3936) and Friday return (0.3941) records showed high returns, while on Monday (0.3715) records showed a low return.

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE- International Journal of Management Research (GE-IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 214

Capital Goods Sector daily returns for the period 2010 - 2014

Company	Monday	Tuesday	Wednesday	Thursday	Friday
BEL	-0.1347	-0.1448	-0.1702	-0.1502	-0.1403
BHEL	0.9014	0.8935	0.9102	0.9199	0.928
BMEL	0.1933	0.1647	0.1488	0.1954	0.2037
Crompton Greaves	0.3442	0.3381	0.3485	0.3547	0.3419
Havells	0.2725	0.2661	0.2718	0.2848	0.2748
L&T	0.05	0.0487	0.0465	0.0418	0.0483
PipavavDoc	0.1256	0.1339	0.1424	0.1283	0.142
Seimens	-0.1599	-0.1682	-0.1743	-0.1375	-0.1239
Suzlon Energy	0.7719	0.761	0.7602	0.8054	0.8003
Wabag Tech	0.0492	0.0518	0.072	0.0513	0.0539

Source: Secondary data

Under different measures of frequency, BHEL company has the highest return among the volume toppers, followed by Suzlon Energy, Crompton Greaves, Havells while Wabag Tech, L&T has the lowest one. The company like BEL, Seimens has negative return. In most cases average returns appear to match higher volatility.

Table : Capital goods Over all return for the period 2010 to 2014

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Return	0.2413	0.2344	0.2355	0.2493	0.2528

Source: Secondary data

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE– International Journal of Management Research (GE–IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 215

On comparing the day wise return in the capital goods sector on Friday (0.2528) records showed high returns, followed by Thursday (0.2493) records high return, while on Tuesday (0.2344) records showed a low return.

TECHNOLOGY SECTOR

Technology Sector daily returns for the period 2010 - 2014

Company	Monday	Tuesday	Wednesday	Thursday	Friday
Airtel	-0.0314	-0.0229	-0.0312	-0.0231	-0.0353
HCL	-0.5787	-0.5693	-0.6043	-0.6009	-0.6116
Idea	-0.3799	-0.3633	-0.3785	-0.3584	-0.3715
Infy	0.1152	0.1143	0.1114	0.1029	0.0958
Inox	-0.377	-0.3772	-0.385	-0.367	-0.3627
Just Dial	-0.9093	-0.9199	-1.0174	-0.999	-0.9729
Reliance Comm	0.3097	0.3264	0.337	0.3129	0.3316
TCS	-0.4846	-0.4841	-0.5133	-0.5085	-0.5223
Tech Mahindra	-0.3709	-0.3685	-0.3754	-0.3778	-0.3677
Wipro	0.0925	0.098	0.0923	0.0949	0.08205

Under different measures of frequency, Reliance Communication company has the highest return among the volume toppers, followed by Infosys, and Wipro. The company like Just dial, Hcl, Airtel, Tech Mahindra, TCS, Inox, Idea has negative return. In most cases average returns appear to match higher volatility.

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE– International Journal of Management Research (GE–IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 216

Table: Technology Sector Over all return for the period 2010 to 2014

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Return	-0.26144	-0.25665	-0.27644	-0.2724	-0.2734

Source: Secondary data

On comparing the day wise return in the technology sector all the day records the negative return only, while comparing the return Wednesday (0.2764) records high negative return and Tuesday (0.2566) records low negative returns.

Volatility of Returns

The volatility of returns is indicated by the term standard deviation or risk. Sectorals standard deviations of daily returns.

Volatility of Power Sector

Company	Standard Deviation
Adani Power	2.5695
BNEL	5.1701
Crompton greaves	3.07963
GMR Infrs	2.8912
JSW Energy	2.6797
reliance infra	2.71369
reliance power	2.3823
Seimens	1.9843
Suzlon energy	3.5942
torrent	2.3857

Source: Secondary data

The company with highest standard deviation on power sector is BHEL with 5.17, followed by Suzlon energy with 3.59 and Crompton greaves with 3.07. The remaining companies shows the same volatility and Seimens records with 1.98.

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE- International Journal of Management Research (GE-IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 217

Table: Over all Volatility of Power Sector for the period 2010 to 2014

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Avg SD	6.85556	6.8185	7.0699	6.9157	6.8631

On comparing the day wise volatility in the power sector on Wednesday (7.069) records the high volatility, followed by Thursday (6.91), while on Tuesday (6.81) records low volatility.

Table: Volatility of Capital Goods

Company	Standard Deviation
Bel	1.74945
bhel	5.17015
bmel	2.6798
cg	3.07963
havells	5.213004
l&t	2.19838
pipavavdoc	2.5417
seimens	1.9843
suzlon	3.5942
wagbag	3.495

Source: Secondary data.

The company with highest standard deviation on capital goods sector is BHEL with 5.17 and Havells(5.21), followed by Suzlon energy with 3.59 and Wabag tech with 3.14. The remaining companies shows the same volatility and BEL records with 1.74.

Over all Volatility of capital goods Sector for the period 2010 to 2014

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Avg SD	7.5726	7.4133	7.573	7.5612	7.6547

Source: Secondary data

On comparing the day wise volatility in the capital goods sector on Friday(7.65) records the high volatility, followed by Wednesday(7.573) and Monday(7.572), while on Tuesday(7.41) records low volatility.

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE- International Journal of Management Research (GE-IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 218

Volatility of Technology Sector

Company	Standard Deviation
Airtel	1.9826
hcl	1.8682
idea	2.1711
infy	2.70416
inox	3.03304
just dail	3.6367
reliance comm	2.97167
tcs	1.6649
tech m	1.9234
wipro	2.2133

Source: Secondary data

The company with highest standard deviation on technology sector is Just dial with 3.63, followed by Inox with 3.03 and Reliance communication with 2.97. The remaining companies shows the different volatility.

Over all Volatility of Capital goods Sector for the period 2010 to 2014

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Avg SD	5.1436	5.1411	5.3541	5.2153	5.23521

Source: Secondary data

On comparing the day wise volatility in the technology sector on Wednesday(5.35) records the high volatility, followed by Friday(5.23), while on Tuesday(5.141) and Monday(5.143) records low volatility.

The Day of the Week Effect

To test the normality of returns among all the days returns and the respective sectors. Kruskal Wallis test is done and the following table gives the result of it.

Kruskal Wallis Test

Kruskal Wallis Test for the sector Power, Capital goods, Technology Ranks

	Sector	N	Mean Rank
mondayreturn	Power	10	21.10
	technology	10	8.00
	Capital Goods	10	17.40
	Total	30	
tuesdayreturn	Power	10	21.40
	technology	10	8.00
	Capital Goods	10	17.10
	Total	30	
wednesdayreturn	Power	10	21.30
	technology	10	8.00
	Capital Goods	10	17.20
	Total	30	
thursdayreturn	Power	10	21.50
	technology	10	8.00
	Capital Goods	10	17.00
	Total	30	

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE– International Journal of Management Research (GE–IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 220

fridayreturn	Power technology	10	21.40
	Capital Goods	10	8.00
	Total	10	17.10
		30	

Test Statistics[a,b]

	Monday return	Tuesday return	Wednesday return	Thursday return	Friday return
Chi-Square	11.781	12.091	11.982	12.204	12.091
Df	2	2	2	2	2
Asymp. Sig.	.003	.002	.003	.002	.002

Source: Secondary data

a. Kruskal Wallis Test

b. Grouping Variable: sector

Hypothesis

Ho: There is no difference in the returns across the days of the week

H1: There is a difference in the returns across the days of the week

Significance level α = 0.05

Decision

Since p value on Monday = **0.003** ‹ **0.05** = α

Since p value on Tuesday = **0.002** ‹ **0.05** = α

Since p value on Wednesday = **0.003** ‹ **0.05** = α

Since p value on Thursday = **0.002** ‹ **0.05** = α

Since p value on Friday = **0.002** ‹ **0.05** = α

We reject all the Null Hypothesis

A Monthly Double–Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE– International Journal of Management Research (GE–IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 221

From the above test results, at α = **0.05** level of significance, if can be noted that there exists enough evidence of difference in the returns across the days of the week in the sectors.

W Test for Normality

To further test the normality of the returns, Shapiro-Wilk test (W Test) is performed.

Normality test for the sector Power Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Returns	.188	10	.200	.949	10	.651

a. Lilliefors Significance Correction. **Source: Secondary data**

Hypothesis

Ho: The sample is taken from a normal distribution

H1: The sample is not taken from a normal distribution

Significance level α = **0.05**

Decision

Since p value = **0.651› 0.05** = α

We accept the Null Hypothesis because the test is significant and assume there is no normality The significance level is greater than **0.05**, the null hypothesis is accepted for the power sectors and hence there is a normality. The sample data are normally distributed. The histogram shows general shape of the distribution of returns.

Normality test for the sector Capital Goods Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Returns	.182	10	.200	.933	10	.478

a. Lilliefors Significance Correction   Source: Secondary data

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE- International Journal of Management Research (GE-IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 222

Hypothesis

Ho: The sample is taken from a normal distribution

H1: The sample is not taken from a normal distribution

Significance level α = 0.05

Decision

Since p value = **0.478** › **0.05** = α

We accept the Null Hypothesis because the test is significant and assume there is no normality. The significance level is greater than **0.05**, the null hypothesis is accepted for the capital goods sectors and hence there is a normality. The sample data are normally distributed. The histogram shows general shape of the distribution of returns.

Normality test for the sector Technology Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Returns	.195	10	.200	.952	10	.691

a. Lilliefors Significance Correction

 Hypothesis

Ho: The sample is taken from a normal distribution

H1: The sample is not taken from a normal distribution

Significance level α = 0.05

Decision

Since p value = **0.691** › **0.05** = α

We accept the Null Hypothesis because the test is significant and assume there is no normality The significance level is greater than **0.05**, the null hypothesis is accepted for the technology sectors and hence there is a normality. The sample data are normally distributed. The histogram shows general shape of the distribution of returns.

Levene's Statistics

To test if there is a variance in the returns among the sectors taken for the study, Levene's Rubin test is performed. The results of the test is summarized as follows.

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE- International Journal of Management Research (GE-IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 223

Table Levene's test for the sector Power, Capital Goods, Technology

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
mondayreturn	Between Gro	2.235	2	1.117	9.197	.001
	Within Groups					
	Total	3.280	27	.121		
		5.514	29			
tuesdayreturn	Between Gro	2.207	2	1.103	9.106	.001
	Within Groups					
	Total	3.272	27	.121		
		5.479	29			
wednesdayreturn	Between Groups	2.395	2	1.197	9.174	.001
	Within Groups					
	Total	3.524	27	.131		
		5.918	29			
thursdayreturn	Between Gro	2.456	2	1.228	9.544	.001
	Within Groups					
	Total	3.473	27	.129		
		5.929	29			
fridayreturn	Between Groups	2.476	2	1.238	9.744	.001

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE– International Journal of Management Research (GE–IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 224

Within Groups	3.430	27	.127		
Total	5.905	29			

Source: Secondary data

Hypothesis

Ho: Homogeneity does exists in days of the week effect

H1: Heterogeneity exists in days of the week effect

Significance level α = 0.05

Decision: Since p value = 0.001 ‹ 0.05 = α. We reject the Null Hypothesis because the test is significant and assume there is no homogeneity

The significance level is less than 0.05 for all the days, the null hypothesis is rejected, hence there is heterogeneity exists between the days of the week effect for all the sectors.

Correlation of Returns

To test the relationship between the sectors selected for study, inter correlation analysis is performed. This is very important test to identify the combination of sectors, by an investor when it comes to the question of constructing the portfolio out of the selected sectors of the study. The results of the test is given as follows:

Table Correlation of sectoral market daily returns for the period 2010 to 2014

Correlations

		Power	technology	Capital goods
power	Pearson Correlation	1	.020	.804[**]
	Sig. (2-tailed)		.957	.005
	N	10	10	10

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE- International Journal of Management Research (GE-IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 225

technology	Pearson Correlation	.020	1	-.159
	Sig. (2-tailed)	.957		.661
	N	10	10	10
capitalgoods	Pearson Correlation	.804**	-.159	1
	Sig. (2-tailed)	.005	.661	
	N	10	10	10

Source: Secondary data

The correlation relationship between power sector stocks and capital goods stock is highly positively correlated, while the relationship between power with technology sector is positive and it is low when compared to capital goods sector. The correlation coefficient between technology and power sector stock is positive, while the relationship between technology and capital goods sector is negatively correlated. The correlation between capital goods with power sector is high positively correlated, while the relationship between capital goods with technology negatively related.

When we construct a portfolio, investment in power and technology sectors can be clubbed, investment in power and capital goods should not be made as the correlation coefficient (0.80) is highly positively correlated. If investor makes in particular this combination, he / she has to face heavy risk in declining conditions of the market.

Investment in technology and capital goods can be clubbed as the negatively correlated (-0.159) between these two sectors.

1) **Daily returns pattern**

The results indicate that power sector stock and capital goods stock have recorded positive returns on a daily basis, while technology sector stock have recorded negative returns on a daily basis.

> ➢ On comparing the day wise return in the power sector stock on

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE– International Journal of Management Research (GE–IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 226

Thursday (0.3936) and Friday (0.3941) records showed high returns, while on Monday (0.3715) records showed a low return.

➢ On comparing the day wise return in the capital goods sector stock on Friday(0.2528) records showed high returns, followed by Thursday(0.2493) records high return, while on Tuesday(0.2344) records showed a low return.

➢ On comparing the day wise return in the technology sector stock all the day records the negative return only.

2) Volatility of returns

The results indicate that power sector stock shows the highest standard deviation of **0.0891**, followed by technology sector stock shows the high standard deviation of **0.07669**, while capital goods sector stock shows the lowest standard deviation of **0.0692**.

➢ On comparing the day wise volatility in the power sector stock on Wednesday(7.069) records the high volatility, followed by Thursday(6.91), while on Tuesday(6.81) records low volatility.

➢ On comparing the day wise volatility in the capital goods sector stock on Friday(7.65) records the high volatility, followed by Wednesday(7.573) and Monday(7.572), while on Tuesday(7.41) records low volatility.

➢ On comparing the day wise volatility in the technology sector stock on Wednesday(5.35) records the high volatility, followed by Friday(5.23), while on Tuesday(5.141) and Monday(5.143) records low volatility.

3) Hypothesis Test
(I) Kruskal Wallis Test

There is a difference in the returns across the days of the week. Since p value for Monday(0.003), Tuesday(0.002), Wednesday(0.003), Thursday(0.002), Friday(0.002) is less than or equal to **0.05** α value. At the α = **0.05** level of significance, there exists enough evidence to conclude that there is a difference in the returns across the days of the week in the sectors.

(II) Shapiro-Wilk Test - Sectoral Normality Test

The sample is taken from a normal distribution. Significance level α = **0.05**, since p value for power sector is **0.651**. It is greater than **0.05**, the null hypothesis is accepted for the power sectors and hence there is a normality. The sample data are normally distributed.

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE- International Journal of Management Research (GE-IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 227

The sample is taken from a normal distribution. Significance level α = 0.05, since p value for capital goods sector is 0.478. It is greater than 0.05, the null hypothesis is accepted for the power sectors and hence there is a normality. The sample data are normally distributed.

The sample is taken from a normal distribution. Significance level α = 0.05, since p value for technology sector is 0.691. It is greater than 0.05, the null hypothesis is accepted for the power sectors and hence there is a normality. The sample data are normally distributed.

(III) Levene's Test - Analysis of variance

To test the homogeneity or heterogeneity of the day of the week effect among three sectors.

Homogeneity / Heterogeneity exists in day of the week effect. Significance value is   α = 0.05. Since p value is 0.001 in all days in all sectors, which is less than or equal to 0.05, we reject the Null Hypothesis. Hence there is heterogeneity existence between the days of the week effect for all the sectors.

4) Correlation of returns

The correlation relationship between power sector stocks and capital goods stock(0.804) is highly positively correlated, while the relationship between power with technology sector(0.020) is positive and it is low when compared to capital goods sector. The correlation coefficient between technology and power sector stock (0.020) is positive, while the relationship between technology and capital goods (-0.159) sector is negatively correlated. The correlation between capital goods with power sector (0.804) is high positively correlated, while the relationship between capital goods (-0.159) with technology negatively related.

Conclusion

During the period 2010 to 2014, power sector stock markets and capital goods sector stock markets recorded positive returns on a daily basis, while technology sector stock market recorded negative returns on a daily basis. Most of the high performing stock are emerging stocks in these sectors. On the basis of the results it was found that the period 2010 to 2014, is more volatile and it raises the investor's confidence. As is to be expected many of the stock markets that recorded very high returns also showed high standard deviations. There was presence of the day-of-the-week effect in these emerging sectors.

From these evidence to conclude that there is a difference in the returns across the days of the week in the sectors and from these sectors stock markets tested significant to the Levene's test of equality of variance of daily returns.

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE- International Journal of Management Research (GE-IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 228

The correlation relationship between power sector stocks and capital goods stock (**0.804**) is highly positively correlated, while the relationship between powers with technology sector (**0.020**) is positive and it is low when compared to capital goods sector. The correlation coefficient between technology and power sector stock (**0.020**) is positive, while the relationship between technology and capital goods (**-0.159**) sector is negatively correlated. The correlation between capital goods with power sector (**0.804**) is high positively correlated, while the relationship between capital goods (**-0.159**) with technology negatively related.

Bibliography

1. Mergers, Acquisitions and Corporate Restructuring (Fifth Edition) by Patrick A. Gaughan.

2. Security analysis and portfolio Management by Rajinder S. Aurora and Kavita Shetty.

3. Financial Management (McGraw-Hill Executive MBA Series) by J. Fred Weston, Samuel C. Weaver.

4. Gajera, Mr. Alpesh, Mr. Pranavdev Vyas, & Mr. Pankaj Patoliya. "Risk and Return Analysis of BSE Small, Medium & Large Capitalization Indices." *Scholedge International Journal of Management & Development ISSN 2394-3378* [Online], 2.4 (2015): 32-37.

5. IBM SPSS for Introductory Statistics (Fifth Edition) by George A. Morgan, Nancy L. Leech, Gene W. Gloeckner, Karen C. Barret

6. Security analysis and Portfolio Management by S. Punithavathy Pandian.

7. Stock Market Mechanisms by S. Hull.

A Monthly Double-Blind Peer Reviewed Refereed Open Access International e-Journal – Included in the International Serial Directories.

GE– International Journal of Management Research (GE–IJMR)

Website: www.aarf.asia. Email: editoraarf@gmail.com , editor@aarf.asia

Page 229