
A Study of The Impact of Information Technology on Stock Market Indices

Kavita Vijay*
Neha Lakhotia**

Abstract

A Stock market index is a leading indicator of the performance of the overall economy or a sector of the economy through providing up to date information. Indices serve as a benchmark for measuring the performance of stocks or portfolios. Indian Stock Market has many indices and it contains many companies and every index is important. Investors, Stakeholders and Policy Makers invest the money in stock market, especially in sectoral indices, and gain more profits. Information Technology (IT) industry has played a major role in the Indian economy during the last few years and the same is even reflected in the performance of the companies individually as also through their respective indices. A number of large, profitable Indian companies today belong to the IT sector and a great deal of investment interest is now focused on the IT sector. Information technology provides mass access to the stock market, while improving efficiencies which enables investors to make informed decisions. Technology and e-business have impacted the stock market in several significant ways. This paper proposes to analyze the impact of BSE TECK index, BSE IT index and CNX IT index on Sensex and Nifty respectively. The appropriate regression test would be applied to test the data.

Keywords: Information technology, indices, SENSEX, Nifty

Introduction

Stock market indices are the barometers of the stock market which reflects the stock market behavior and give a broad outline of the market movement to represent the market. A stock market index consists of a group of stocks that are representative of the whole market or a specified sector or segment of the market. The analysis of different sectors of economy facilitates the Government to use it as the reference guide for the formulation of economic policy and represent economic growth report covering different industries. The investors try to find out the most promising sectors and review the performance of companies within the sector to determine which individual stock would provide better returns and would hence purchase such stocks. Information Technology (IT) industry has played a major role in the Indian economy during the last few years. The information technology sector has transformed the economy and changed the basis of Competition. The IT index provides investors and market intermediaries with an appropriate benchmark that captures the performance of the IT segment of the market. Companies in IT index are those that have more than 50% of their turnover from IT related activities like IT Infrastructure, IT Education and Software Training, Telecommunication Services and

Networking Infrastructure, Software Development, Hardware Manufacturer's, Vending, Support and Maintenance. The present study aims to analyze the effect of Indian IT Index based on BSE and NSE upon the Sensex and Nifty indices. The IT industry is one of the important sectors of the economy. Therefore, this paper tests the market efficiency across the companies under IT sector, listed at the BSE and NSE, using daily closing share prices during a given period.

Literature Review

There have been numerous studies which have been conducted to examine the impact of IT and other different sectors on stock market indices. They are summarized as below. Information technology boosts the efficiency of the decision making process and is perceived by many executives as an integral part of their business strategy. (Molloy and Schwenk, 1995; Bartholomew, 1998).

Terry, Macy, and Abdullat (2010) found a correlation of stock prices for vertically integrated technology companies in a down market but bull market share not highly correlated within the industry. Stock market performance of information technology companies reveals the sector has greater volatility than most other economic sectors (Kamssu, Reithel & Ziegelmayr, 2003).

*Student, Prestige Institute of Management, Dewas

**Faculty, Prestige Institute of Management, Dewas

Rajesh, Selvam, Vanitha, Gayathri and Karpagam (2012) analyzed the market efficiency of Sectoral Indices listed in BSE and found that the returns of 8 indices out of 12 Indices, namely, BSE Automobile Index, BSE Bankex, BSE Capital Goods Index, BSE Consumer Durables Index, BSE Health Care Index, BSE Metal Index, BSE PSU Index, and BSE Realty Index followed normal distribution and earned better return and performed well.

Clemons and Weber (1990a) examined the 1986 Big Bang reforms of the London Stock Exchange, and concluded that IT and the Exchange's new screen-based market were a "strategic necessity". The stock values of information technology firms bear very little relationship to classical business performance measures (**Savitz, 1998**), which creates a need for non-traditional proxies and estimation methods.

Mufeed Rawashdeh and Jay Squalli (2004) tested market efficiency across the four sectors namely, Banking, Industrial, Insurances and Services in the Amman Stock Exchange (ASE) and found that the returns of mean values were highly volatile and over inflated stock prices and frequent market corrections formed a bubble effect which indicates that investment in all sectors of the ASE may be very risky in the short run.

Objectives of The Study

- To examine the effect of the IT Indices on the performance of the Sensex
- To examine the effect of the IT Index on the performance of the NIFTY

Rationale: Information Technology (IT) industry has played a major role in the Indian economy during the last few years. Information technology improves the viability of stock market investments for individual savers and it has made the largest impact on the stock market by increased productivity. New technology has led to the creation of several new industries whose companies are actively traded on the various stock exchanges and the technology companies' own profits have helped fuel the growth in the overall value of the stock market. The study analyzes the impact of IT index on BSE and NSE.

Hypothesis

H₀₁ (Null Hypothesis) = There is no significant effect of IT index listed in BSE on Sensex

H₁₁ (Alternative Hypothesis) = There is significant effect of IT index listed in BSE on Sensex

H₀₂ (Null Hypothesis) = There is no significant effect of IT index listed in NSE on Nifty

H₁₂ (Alternative Hypothesis) = There is significant effect of IT index listed in NSE on Nifty

Research Methodology

Data: The data ranges from a period of Jan 2008 to Dec 2012. The entire data is divided annually into five year periods and the regression is run on the same.

Model: The regression is of the following forms: -

$$Y = \beta_1 + \beta_2 X + \epsilon_{kit}$$

Where

Y = Closing Price of NIFTY

X = Closing Price of CNX IT Index

ϵ_{kit} = error term.

$$Y = \beta_1 + \beta_2 X_1 + \beta_3 X_2 + \epsilon_{kit}$$

Where

Y = Closing Price of SENSEX

X₁ = Closing Price of BSE IT Index

X₂ = Closing Price of BSE TECK Index

ϵ_{kit} = error term.

In addition to the above the data is checked for the presence of autocorrelation using the Durbin-Watson d statistic. Furthermore, the suitability of the model in regression is checked through the F value also.

Results and Analysis

Results for SENSEX

Results for the Jan – Dec 2008 Period

Table 1: Results for Jan-Dec 2008

Durbin-Watson	R Square	Sig. (BSE_IT)	Sig. (BSE TECK Index)	Unstd Beta Coeff (Constant)	Unstd Beta Coeff (BSE_IT Index)	Unstd Beta Coeff (BSE TECK Index)
.192	.983	.000	.000	-482.709	-4.012	10.019

The regression is hence of the following form

$$Y = -482.709 - 4.012X_1 + 10.019X_2$$

se (145.303) (.128) (.154)

t (-3.322) (-31.253) (65.044)

The results of the regression reveal the presence of autocorrelation in the data. Also, the values for BSE_IT Index and BSE TECK index are significant at 0.05 level of significance.

Results for the Jan – Dec 2009 Period

Table 2: Results for Jan-Dec 2009

Durbin-Watson	R Square	Sig. (BSE_IT)	Sig. (BSE TECK Index)	Unstd Beta Coeff (Constant)	Unstd Beta Coeff (BSE_IT Index)	Unstd Beta Coeff (BSE TECK Index)
.078	.971	.780	.000	-603.441	.036	5.571

The regression is hence of the following form

$$Y = -603.441 + 0.036X_1 + 5.571X_2$$

se (225.526) (.129) (.244)

t (-2.676) (.280) (22.829)

The results of the regression reveal the presence of autocorrelation in the data. Also, the values for BSE TECK index are significant at 0.05 level of significance.

Results for the Jan – Dec 2010 Period

Table 3: Results for Jan-Dec 2010

Durbin-Watson	R Square	Sig. (BSE_IT)	Sig. (BSE TECK Index)	Unstd Beta Coeff (Constant)	Unstd Beta Coeff (BSE_IT Index)	Unstd Beta Coeff (BSE TECK Index)
.135	.927	.000	.000	-1277.857	-1.067	7.387

The regression is hence of the following form

$$Y = -1277.85 - 1.067X_1 + 7.387X_2$$

se (374.756) (.264) (.486)

t (-3.322) (-4.044) (15.208)

The results of the regression reveal the presence of autocorrelation in the data. Also, the values for BSE_IT Index and BSE TECK index are significant at 0.05 level of significance.

Results for the Jan – Dec 2011 Period

Table 4: Results for Jan-Dec 2011

Durbin-Watson	R Square	Sig. (BSE_IT)	Sig. (BSE TECK Index)	Unstd Beta Coeff (Constant)	Unstd Beta Coeff (BSE_IT Index)	Unstd Beta Coeff (BSE TECK Index)
.117	.877	.000	.000	-3277.214	-3.246	11.329

The regression is hence of the following form

$$Y = -3277.214 - 3.246X_1 + 11.329X_2$$

se (557.986) (.28) (.534)

t (-5.873) (-12.995) (21.198)

The results of the regression reveal the presence of autocorrelation in the data. Also, the values for BSE_IT Index and BSE TECK index are significant at 0.05 level of significance.

Results for the Jan – Dec 2012 Period

Table 5: Results for Jan-Dec 2012

Durbin-Watson	R Square	Sig. (BSE_IT)	Sig. (BSE TECK Index)	Unstd Beta Coeff (Constant)	Unstd Beta Coeff (BSE_IT Index)	Unstd Beta Coeff (BSE TECK Index)
.017	.114	.083	.000	10403.093	-1.022	3.887

The regression is hence of the following form

$$Y = 10403.093 - 1.022X_1 + 3.887X_2$$

se (1407.172) (.588) (1.038)

t (7.393) (-1.738) (3.744)

The results of the regression reveal the presence of autocorrelation in the data. Also, the values for BSE TECK index are significant at 0.05 level of significance.

Results for NIFTY

Results for the Jan – Dec 2008 Period

Table 6: Results for Jan-Dec 2008

Durbin-Watson	R Square	Sig. (CNX_IT)	Unstd Beta Coeff (Constant)	Unstd Beta Coeff (CNX_IT Index)
.033	.785	.000	289.348	1.115

The regression is hence of the following form

$$Y = 289.348 + 1.115X_1$$

se (138.340) (.037)

t (-2.092) (29.857)

The results of the regression reveal the presence of autocorrelation in the data. Also, the values for CNX IT index are significant at 0.05 level of significance.

Results for the Jan – Dec 2009 Period

Table 7: Results for Jan-Dec 2009

Durbin-Watson	R Square	Sig. (CNX_IT)	Unstd Beta Coeff (Constant)	Unstd Beta Coeff (CNX_IT Index)
.043	.900	.000	1635.322	.663

The regression is hence of the following form

$$Y = 1635.322 + .663X_1$$

se (56.095) (.014)

t (29.153) (46.563)

The results of the regression reveal the presence of autocorrelation in the data. Also, the values for CNX IT index are significant at 0.05 level of significance.

Results for the Jan – Dec 2010 Period

Table 8: Results for Jan-Dec 2010

Durbin-Watson	R Square	Sig. (CNX_IT)	Unstd Beta Coeff (Constant)	Unstd Beta Coeff (CNX_IT Index)
.094	.852	.000	164.457	.854

The regression is hence of the following form

$$Y = 164.457 + .854X_1$$

se (139.827) (.022)

t (1.176) (37.981)

The results of the regression reveal the presence of autocorrelation in the data. Also, the values for CNX IT index are significant at 0.05 level of significance.

Results for the Jan – Dec 2011 Period

Table 9: Results for Jan-Dec 2011

Durbin-Watson	R Square	Sig. (CNX_IT)	Unstd Beta Coeff (Constant)	Unstd Beta Coeff (CNX_IT Index)
.047	.676	.000	2199.120	.505

The regression is hence of the following form

$$Y = 2119.120 + .505X_1$$

se (142.839) (.022)

t (14.836) (22.610)

The results of the regression reveal the presence of autocorrelation in the data. Also, the values for CNX IT index are significant at 0.05 level of significance.

Results for the Jan – Dec 2012 Period

Table 10: Results for Jan-Dec 2012

Durbin-Watson	R Square	Sig. (CNX_IT)	Unstd Beta Coeff (Constant)	Unstd Beta Coeff (CNX_IT Index)
.022	.049	.000	3812.898	.250

The regression is hence of the following form

$$Y = 3812.898 + .250X_1$$

se (428.017) (.070)

t (8.908) (3.580)

The results of the regression reveal the presence of

autocorrelation in the data. Also, the values for CNX IT index are significant at 0.05 level of significance.

Conclusion

The purpose of study is to examine the effect of information technology on Stock market indices. The result shows that strong correlation exists in the data. Also a positive linkage in information technology and stock market movements can be observed. These results are strongly encouraging and IT could be viewed favorably by the investor community. Also firms are able to generate a greater level of favorable reaction by the investors. Tables 1, 2, 3, 4 and 5 shows that BSE TECK has significant relationship with Sensex for a period of five years of study and BSE IT also indicates a significant relationship for a study period of Jan 08 – Dec 09 and Jan 2010- Dec 2011. Table 6 shows that CNX IT Index has insignificant relationship with stock market movements. Whereas tables 7, 8, 9 and 10 indicate a significant relationship for rest of the period. From the above results, it can be inferred that IT companies are being able to attract the investors and their own profits have helped fuel the growth in the overall value of the stock market. The study reveals that growth in IT sector has enough scope for attracting the investments and has a strong relationship with stock market.

References

1. Bartholomew, D. (1998). How to lead? *Industry Week*, 247(2), 27-30.
2. Clemons, E.K. and B.W. Weber."London's Big Bang: A Case Study of Information Technology, Competitive Impact, and Organizational Change *Journal of Management Information Systems*, Vol. 6, No. 4, (Spring 1990), pp. 41-60.
3. Kamssu, A., Reithel, B., & Ziegelmayer, J. (2003). Information technology and financial performance: The impact of being an Internet-dependent firm on stock returns. *a. Information Systems Frontiers*, 5(3), 279-288.
4. Molloy, S. & Schwenk, C. (1995). The effects of information technology on strategic decision making. *Journal of Management Studies*, 32(3), 283-311.
5. Ramkumar R.R., Selvam M., Vanitha S., Gayathri J. and Karpagam V. 2012, "An Analysis of Market Efficiency in Sectoral Indices: A Study

with a Special Reference to Bombay Stock Exchange in India “ European Journal of Scientific Research ISSN 1450-216X Vol.69 No.2 (2012), pp. 290-297

6. Rawashdeh M. and Squalli, J. (2005) “A Sectoral Efficiency Analysis of the Amman Stock Exchange”, *Working Paper* No. 05-04.
7. Savitz, E. (April 20, 1998). A momentary lapse for Internet stocks, but mostly they defy gravity. *Barron's*, Chicopee.

8. Terry, N., Macy, A, & Abdullat, A. (2010). Stock market volatility: A comparison of vertically integrated technology companies. *The Journal of the American Academy of Business, Cambridge*, 15(2), 242-249.

Webliography

- www.bseindia.com
- www.nseindia.com