

Examining Associations between Sensex and Selected International Stock Markets

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Abstract

Indian Stock market has its importance not only in India but also all over the world. Indian stock market has a big role on the world stock market. It fluctuates with the flow of foreign direct investment and foreign Institutional investment. So it is very important to understand the association between Indian stock market and International stock market. Consequently the primary objective of this research is examining associations between Sensex and Selected International stock markets. For examining associations between Sensex and International stock markets the daily closing prices of the entire sample indices have been taken into consideration. The study is focused on secondary data over a period of 11 years from 1st January 2011 to 31st December 2019. For achieving the objectives, various methods like correlation, descriptive statistics and regression analysis have been employed.

Keywords: Association, Sensex, International Stock Market, Correlation, Regression

1. Introduction

Indian Stock market has its importance not only in India but also all over the world. Indian stock market is a developing market. When there is a change in the developed stock market, it has a great impact in the Indian stock market. Also Indian stock market has a big role on the world stock market. It fluctuates with the flow of foreign direct investment and foreign Institutional investment. So it is very important to understand the connection among Indian Stock market and Developed stock market. Comparison of different indices is required to comprehend the association between different stock market in developing and developed stock market. Investors can invest in international market and also in domestic market to gain more profit. Flow of capital between countries increased due to globalization and liberal trade policy. Change in one stock market affects the stock market in other country. Change in any fundamental factors in one country affects the stock market of other country (Bhatia and Binny 2014). Investors always try to get information about the irregularity in different market before investing. Investors can gain high return by investing in different stock market across different countries.

Developed and developing stock markets are associated significantly (Aktar, 2009). Understanding worldwide stock market is important in the active financial market. Investors and portfolio managers should understand the implications before taking any investment decisions. Institutions and individuals should diversify their portfolio to reduce the risk (Siddiqui, 2009). Portfolio diversification theory says that when there is an association between international stock markets it is not possible for the investors to get long term profit. So it is very important for the investors and international portfolio managers to understand the global markets (Ali et al., 2011). A lot of analysis shows that there is a strong connection among Indian stock market and global stock market. (Rathod, 2015). So this analysis is very much helpful for the investors in addition to also for the portfolio managers.

2. Literature Review

Levy and Sarnat (1970) analyzed that investors generally prefer to diversify his portfolio in international market than to invest in domestic market for getting more profit. Investors can get more benefit from international market. While Hansda and Ray (2002) tried to find the relationship between the Indian stock market in addition to the US stock market. They have done econometric analysis by taking time series data. Similarly Samadder et al. (2016) have taken Dow-Jones, Sensex and Nifty for their study. They found that there is no big difference among Dow-Jones then Sensex in addition to Dow-Jones and Nifty. So investors cannot get much return by diversifying to international stock market. Mukherjee (2007) have taken Indian

market and different international stock market from January 2006 to July 2006 for their study. They have used correlation; exponential trend and risk return analysis for the research. They found that Indian stock market is significantly associated with international stock market.

On the other hand Singh and Singh (2010) tried to find the relationship between Indian stock market and Chinese, USA, UK, Japan and Hong Kong Stock Market. They have taken a period of 2000 to 2009 for the analysis. They have used different statistical techniques for the study. They found that there is a unilateral causality between Indian stock market and International stock market. However Panda and Acharya (2011) have taken Indian stock market and international stock market for the period of January 2001 to November 2008. They tried to find the viewpoints of diversification in international stock market. They found that Indian stock market is significantly associated with US Stock market. But not significantly associated with other international stock market for the study period. While Saha and Bhunia (2012) explored the integration among Indian stock market and South Asian stock markets considering daily stock price indices during August 2002 and August 2011 using integration and Granger causality tests methods. The researchers stated that altogether the markets are related in the short run as well as in the long run whereas divergence chances happened for investors in the short run. While Patjoshi (2012) scrutinized the correlation as well as comparative risk return analysis of Indian Stock Market with Global Markets. Similarly Patjoshi (2014) examined the comparative risk return analysis of Indian Stock Market and International Stock Market.

Correspondingly Rastogi (2013) examined the long run connotation among various stock markets. Experiential consequences resulted that different stock markets are related in the long run then it continued the concept of consideration which multiplied that global divergence assistance use to decrease owed to improved association between the stock markets of different countries. Whereas Srivastava et al., (2015) scrutinized the market incorporation of the different stock markets in world together with US as well as major Asian stock markets before then after latest international financial crisis. The study conducted by considering the sample stock market indices from January 1992 to April 2014 by applying the tools of econometrics as well as statistical. The consequences presented the being of robust long run incorporation though, the absence of short run incorporation of Indian stock market among international stock markets.

Conversely Alvi et al. (2015) examined the movement among Pakistan stock market besides major countries that are connected with Pakistan in relations of UK, US, Canada, Germany, Australia, France, Netherlands then Japan by considering the time series data of stock indices for the study period from 2007 July to 2014 June by utilizing the techniques of financial econometrics. They disclosed from empirical results that Pakistan stock market did not have a similar movement predominantly with the greatest significant major countries stock markets. They also discussed that nonexistence of movement among Pakistan stock market offers the investors in addition to fund managers to find the divergence assistance by portfolio investment in Pakistan stock market. The researchers recommended that the present study will help the investors in discovering such markets that have healthier divergence returns for the motive that divergence decreases the risk constituent. Likewise Lokeshwarri (2015) supported that global market have an effect on Indian stock market and use to change due to correlation statistics among Indian stock market besides global stock markets was 0.51 in the year 2015 from 0.70 in 2014. On the same time, the connotation among Indian stock market besides US stock market was negative in the year 2015, which designated that both the markets were stirring in opposite trend.

3. Objectives of the Study

The outline of this study is examining associations between Sensex and selected International stock markets. Consequently the research is originated over the subsequent objectives

- a. To examine associations between Sensex and selected International stock markets.
- b. To investigate the impact of International stock market on Sensex.

4. Methodology and Tests Used in the Study

In this study Sensex and the sample selected international stock market indices have been used to examine the associations between Sensex and selected international stock markets. The sample international stock market indices which have considered for the study are SENSEX (S&P Bombay Stock Exchange, India), DAX Performance-Index (German Stock Index DAX 30), DOW JONES Industrial Average (Dow Jones Industrial Average-DJIA U.S. 30), HANG SENG (Stock Exchange of Hong Kong), NASDAQ (Composite large market-cap-weighted index of more than 2,500 stocks, US), NIKKEI 225 (Tokyo Stock

Exchange-TSE), S&P ASX 200(Institutional Investable benchmark in Australia) and TSX (S&P/TSX Composite Canadian index). The associations have investigated by considering the daily closing prices of all the sample indices from secondary sources. The data for the analysis has taken from the BSE website over a period of 11 years from 1st January 2009 to 31st December 2019. The association of the planned study have been examined by means of the Statistical Package for Social Sciences (SPSS) in addition to MS excel 2010. To study the objectives different tools like Descriptive statistics, Correlation analysis and Regression analysis have been employed.

5. Empirical Results

5.1 Descriptive Statistics Results of Sensex and Selected International Stock Markets

Table-1 reveals the descriptive statistics results of daily returns of Sensex as well as Selected International Markets.

Table: 1 Descriptive Statistics Results of Sensex and Selected International Stock Markets

Particulars	Mean	Standard Deviation	Kurtosis	Skewness	Minimum
SENSEX	0.0420	1.1233	17.3145	0.8775	-7.5231
DAX	0.0346	1.2654	2.5720	-0.2492	-7.0673
DOW JONES	0.0355	1.3468	4.7052	-0.4592	-11.1534
HANG SENG	0.0224	1.2467	2.4173	-0.1055	-6.0183
NASDAQ	0.0582	1.1653	3.6144	-0.3034	-7.1489
NIKKEI	0.0395	0.9685	4.4725	-0.3037	-5.7061
ASX	0.0244	0.9216	1.9077	-0.2988	-4.3657
TSX	0.0212	0.8783	3.6600	-0.3696	-5.5104

It can be observed from table-1 thatSENSEX as well as all sample international stock markets have provided positive mean returns during the study period from 1st January 2009 to 31st December 2019. It hasfound that the mean returns of NASDAQ (0.0582) have recorded maximumreturns whereas mean returns of TSX(0.0212) have recorded minimum returns. The two better performer globalindices are NASDAQ(0.0582) and SENSEX(0.0420). In contrast the bottom top lower performer global indices are TSX (0.0212) andHANG SENG(0.0224). The volatility which use to measurethrough standard deviation loggedmaximumfor DOW JONES whereas standard deviation loggedminimum for TSXas compare to other selected global indicesover the study period. On the basis of the standard deviation the twolarger volatile global indices are DOW JONES(1.3468) andDAX(1.2654), nevertheless twolesser volatile global indices are TSX(0.8783)and ASX(0.9216).

While examining the SENSEX returns as compare to sample global indices return, it can found that SENSEX has provided better returns than all international stock market indices except NASDAQ. AlternativelySENSEX returns include less volatile then DAX, DOW JONES, HANG SENG and NASDAQ.

5.2 Analysis of Correlation between Sensex and Selected International Stock Markets

Table-2 articulates the correlation among daily stock returns of Sensex and Selected Cement Companies in India for the last ten years from January 2010 to December 2019.

Table-2: Correlation between Sensex and Selected International Stock Markets

Particulars	SENSEX	DAX	DOW JONES	HANG SENG	NASDAQ	NIKKEI	ASX	TSX

SENSEX	1.00							
DAX	0.01	1.00						
DOW JONES	0.03	-0.02	1.00					
HANG SENG	0.10	0.00	0.06	1.00				
NASDAQ	0.01	-0.01	0.04	0.06	1.00			
NIKKEI	0.02	-0.02	0.04	0.07	0.91	1.00		
ASX	0.02	0.10	-0.01	0.00	0.05	0.04	1.00	
TSX	0.04	0.07	-0.01	0.01	0.02	0.02	0.00	1.00

It can be found from table-2, that SENSEX returns are positively correlated with that of all selected global indices returns. The top ranked global indices which are positively correlated with SENSEX returns are HANG SENG (0.10), TSX (0.04) and DOW JONES (0.03). On the other hand, the bottom ranked global indices which are positively with SENSEX returns are DAX (0.01) and NASDAQ (0.01).

6.3 Analysis of Regression Results for Returns on Sensex Dependent Variable and Various Selected International Stock Markets as Predictors

Table 4: Regression Results for Sensex as Dependent Variable and Various Selected International Stock Markets as Predictors

Model Summary	Multiple R	R Square	Adjusted R Square	Standard Error
		0.11	0.01	0.01
Goodness of Fit – ANOVA	SS	MS	F	Significance F
	45.00	6.43	5.15	0.00
Regression Coefficients				
Particulars	Coefficients	Standard Error	t Stat	P-value
Intercept	0.04	0.02	1.74	0.08
DAX	0.00	0.02	0.15	0.88
DOW JONES	0.02	0.02	1.42	0.15
HANG SENG	0.09	0.02	5.14	0.00
NASDAQ	-0.03	0.04	-0.71	0.48
NIKKEI	0.04	0.05	0.82	0.41
ASX	0.03	0.02	1.12	0.26
TSX	0.05	0.02	1.98	0.05

Table-4 reproduces the regression analysis amongst SENSEX returns as dependent variable with the Selected international stock markets returns as independent variables. It can be noticed from table-4 that F-statistics value of 5.15 ($P < 0.10$) displays that the independent variables are jointly statistically significant at 10% level. The regression result designates that the coefficients of HANG SENG and TSX international indices recorded higher coefficients while NASDAQ index has recorded lesser in addition to negative coefficients as compare to other international indices. Subsequently the returns of HANG SENG and TSX international indices impact more on the SENSEX returns as compare to other international indices returns. Conversely NASDAQ and DAX international indices have lower impact on SENSEX returns. The regression model exposes that HANG SENG and TSX international indices returns are statistically significant association amongst SENSEX return (Sig. < 0.10) at 10% level. Whereas regression model expresses that DAX, DOW JONES, NASDAQ, NIKKEI and ASX international indices are statistically insignificant association among Sensex return (Sig. > 0.10) at 10% level.

6. Conclusion

Indian Stock market has its importance not only in India but also all over the world. Indian stock market has a big role on the world stock market. So it is very important to understand the association between Indian stock market and International stock market. Consequently the primary objective of this research is examining

associations between Sensex and selected international stock markets over a period of 11 years from 1st January 2011 to 31st December 2019. For achieving the objective, various methods like correlation, descriptive statistics and regression analysis have been employed. It has found that the top two better performer global indices are NASDAQ and SENSEX while lower performer global indices are TSX and HANG SENG. On the basis of the standard deviation the two larger volatile global indices are DOW JONES and DAX whereas two lesser volatile global indices are TSX and ASX. While examining the SENSEX returns as compare to sample international indices return, it can found that SENSEX has provided better returns than all international indices except NASDAQ. Alternatively SENSEX returns include less volatile then DAX, DOW JONES, HANG SENG and NASDAQ. However SENSEX returns are positively correlated with that of all selected international indices returns. The top rank international indices which are positively correlated with SENSEX returns are HANG SENG, TSX and DOW JONES whereas; the bottom rank international indices which are positively with SENSEX returns are DAX and NASDAQ. The regression model expresses that that HANG SENG and TSX international indices returns are statistically significant association amongst SENSEX return (Sig. < 0.10) at 10% level. Whereas regression model expresses that DAX, DOW JONES, NASDAQ, NIKKEI and ASX international indices are statistically insignificant association among Sensex return (Sig. > 0.10) at 10% level.

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