GLOBAL STOCK MARKET INTEGRATION - A STUDY OF SELECT WORLD MAJOR STOCK MARKETS

P. Srikanth,

M.Com., M.Phil., ICWA.,
PGDT.,PGDIBO.,NCMP., (Ph.D.)
Assistant Professor,
Commerce Post Graduate College,
Constituent College of Osmania
University, Secunderabad. A.P.

Dr. K. Aparna,

M.Com, MBA., Ph.D., UGC-NET,
Assistant Professor,
Business Management,
Telangana University Dichpally,
Nizamabad, A.P.

ABSTRACT

The present study is being contemplated with the objective of studying the degree of stock market integration. In this study, month-wise average prices of BSE-Sensex, NYSE, NASDAQ, S&P500, HangSeng, Nikkei225, SSE Composite index and FTSE100 have been selected. Multiple Correlations has been computed for the select stock market indices. Statistical Significance of the correlation has been tested by applying correlation t-test. The results of these studies support the view that there is a substantial integration between domestic and international financial markets. BSE-Sensex has witnessed greater fluctuations which has been indicated by very high Ce-efficient of variation compared to other select indices. Sensex, the Indian bench market index, has shown strong association with NYSE and Hang Seng. Chinese stock index i.e., SSE Composite index has exhibited strong correlation with BSE- Sensex and with Hang Seng. Japanese stock index i.e., Nikkei225 has strong correlation with all the select indices except Sensex, HangSeng and SSE Composite index. The European index i.e., FTSE100 has exhibited strong correlation with all the US stock market indices and with Nekkei225, the Japanese stock market index.

Keywords: Stock market integration, Global stock markets.

1. INTRODUCTION:

The globalization of the world stock markets is the most significant development that has occurred during the last decade. Various factors contributed to this including: the advancement of technology and remote access which have been utilized in security trading, the emergence of new international financial institutions offering financial services regardless of geographical jurisdictions, trends of liberalization and the removal of restrictions used to be imposed on foreign ownership, and the movement towards regional integration of that stock exchanges, clearing and settlements organizations, and other financial institutions. Along with various measures, opening up of the home market for the foreign investors is one of the important steps taken by the Indian Government that may lead the Indian stock market to be strongly integrated with the stock market of the rest of the world. The globalization phenomenon may be blessing, since many experts believe that globalization may improve market efficiency, lower its risk due to the possibility of diversification, and use arbitrage in a relevant way. On the other hand, it may increase pricing volatility and trading instability, due to the high correlation between leading - major- stock markets and other markets as well as to the fact that the irrational trading in one market may move to other markets as witnessed in the last two decades..

2. LITERATURE REVIEW:

William L. Huth et *a*l have opined that economic interdependence between nations has been the focus of considerable research. In their view point, a particular avenue of international interrelationship that has received a great deal of recent attention is the integration of international stock markets. Increased trade between nations implies that domestic corporate profitability will be influenced by economic conditions in other countries. If international influence is widespread between particular markets then it is likely that measures of overall market performance will be related[1]. Hazem A. Marashdeh et *a*l examine the extent of stock market integration among the Gulf Cooperation Council (GCC) countries. The results of the empirical tests suggest that the GCC stock markets are not fully integrated and there still exist arbitrage opportunities between some of the markets in the region. On the other hand, the results show no evidence of cointegration between the GCC stock markets and developed markets, which implies that international investors can diversify their portfolio and obtain long-run gains by investing in the GCC markets[2]. Lucía Cuadro Sáez et *a*l analyse whether, and to what extent, emerging market economies (EMEs) have systemic importance for global financial markets, above and beyond their influence during crises episodes. Using a novel database of exogenous economic and political shocks for 14 systematically relevant EMEs, they find that EME shocks not only have a statistically but also economically significant impact on global equity markets. The economic significance of EME shocks is in particular underlined by their remarkably persistent effects over time[3]. Ravazzolo et *a*l examine real and financial links simultaneously at the regional and global level for a group of Pacific-Basin countries by analysing the covariance of excess returns on national stock markets over the period 1980-1998. They find overwhelming evidence at the regional and global level and for all sub-periods that financial integration is accompanied by economic integration. This seems to suggest that economic integration provides a channel for financial integration, which explains, at least partly, the high degree of financial integration found in this study and in other studies for this region even in the presence of foreign exchange controls[4].

3. IMPORTANCE OF THE STUDY:

In the context of increasing globalizing and increasing opportunities to the investors to invest abroad, it is essential for the international portfolio investors from India to understand the level of interdependence among the major stock markets in the world and its impact on Indian stock market. Study of level of correlation between Indian stock market and other major stock markets, helps the investors in planning for international price arbitrage and international portfolio diversification. It is also essential to analyse the level of correlation among the major stock markets themselves. In order to reduce the portfolio risk, an investor will prefer to invest in the stock markets which are less correlated with other stock markets. The present study helps in better international portfolio diversification and making effective planning for international price arbitrage.

4. OBJECTIVES OF THE STUDY:

The objective of the present study is to analysis the level of integration of Indian stock market with major stock markets in the world.

5. METHODOLOGY OF THE STUDY:

6. 5.1. Period of study:

The study covers a period of 10 years from January 2000 to December 2009.

5.2. Sources of Data:

The present study is based on secondary data. Month-wise average prices of select indices have been collected from concerned stock exchange websites. Apart from this, various journals, magazines, text books and articles have been referred to get the relevant information.

S.No.	Index selected for the study	Country	Sl.No.	Index selected for the study	Country
1	Sensex	India	6	HangSeng	Hong Kong
2	Dow Jones Industrial Average	United States of America	7	SSE Composite index	People's Republic of China
3	NYSE	United States of America	8	Nikkei225	Japan
4	NASDAQ	United States of America	9	FTSE100	United Kingdom
5	S&P500	United States of America			

6.3. FRAMEWORK OF ANALYSIS:

For the present study, month-wise average index prices have been chosen. Multiple Correlation has been computed for the select stock market indices. Statistical Significance of the correlation has been tested by applying correlation t-test. Correlation has been divided into three levels. Correlation below 0.40 is treated as Weak; correlation between 0.40 to 0.70 as moderate; and correlation between 0.70 to 1 as strong. Descriptive statistics i.e., Minimum, Maximum, Mean, Standard Deviation, Coefficient of Variation, Skewness and Kurtosis have been computed for the select indices.

7. DESCRIPTIVE STATISTICS FOR THE SELECT INDICES FOR THE PERIOD FROM 1-1- 2000 TO 31-12-2009:

TABLE 1 : DESCRIPTIVE STATISTICS

Indices	N	Minimum	Maximum	Mean	Std. Deviation	Coefficient of Variation	Skewness	Kurtosis
SENSEX	120	2811.60	20286.99	8,374.54	5,049.42	60.29%	0.659	-0.918
DOW	120	7062.93	13930.01	10,466.61	1,453.80	13.89%	0.242	0.002
NYSE	120	4617.03	10311.61	7,046.26	1,410.60	20.02%	0.483	-0.550
NASDAQ	120	1172.06	4696.69	2,185.92	654.76	29.95%	1.678	3.659
SP500	120	735.09	1549.38	1,186.39	197.41	16.64%	-0.142	-0.812
HANGSENG	120	8634.45	31352.58	15,597.13	4,782.11	30.66%	0.909	0.501
SSE Composite index	120	1060.74	5954.77	2113.82	1032.67	48.85%	1.77	2.860
Nikkei225	120	7568.42	20337.32	12,682.00	3,162.20	24.93%	0.421	-.884
FTSE100	120	3567.40	6721.60	5,248.81	866.53	16.51%	-.096	-1.222

As shown in table 1, BSE-Sensex has witnessed greater fluctuations which have been indicated by very high co-efficient of variation followed by SSE composite index. In the case of US indices, NASDAQ has shown highest fluctuations and DOW has shown very low fluctuations. Skewness of the distribution of all the indices prices is positive except S&P500 and FTSE100. European index FTSE100 has lesser fluctuations when compared US indices. Kurtosis in the case of NASDAQ is positively very high followed by SSE Composite index indicating abnormal peaks in the distribution of the indices prices.

8. STUDY OF RELATIONSHIP OF BSE-SENSEX WITH OTHER SELECT INDICES FROM 1-1-2000 TO 31-12-2009:

To study the relationship between BSE-Sensex and other indices selected for the study, the following hypothesis

has been designed.
Null Hypothesis: There is no significant relationship between Sensex and other select indices.
Alternate Hypothesis: There is a significant relationship between Sensex and other select indices.

TABLE 2: CORRELATION BETWEEN BSE-SENSEX AND OTHER SELECT INDICES

Indices	Correlation		T-test results		
	Correlation Coefficient	Level of Correlation	t-value	'p' value	Hypothesis accepted
Sensex & Dow	0.592	Moderate	-4.361	0.001	H_1: Accepted
Sensex & NYSE	0.741	Strong	2.775	0.006	H_1: Accepted
Sensex & NASDAQ	0.164	Weak	13.314	0.001	H_1: Accepted
Sensex & S&P500	0.386	Weak	15.582	0.001	H_1: Accepted
Sensex & HangSeng	0.912	Strong	-11.377	0.001	H_1: Accepted
Sensex & Nikkei225	0.336	Weak	-7.920	0.001	H_1: Accepted
Sensex & FTSE100	0.410	Moderate	6.683	0.001	H_1: Accepted
Sensex & SSE Composite index	0.764	Strong	-13.307	0.001	H_1: Accepted

The study of relationship between BSE-Sensex and other select indices (table 2) indicates that, null hypothesis is rejected and alternate hypothesis is accepted in all the cases. Hence, there is a significant relationship between Sensex and other world major indices. In all the cases, correlation is significant at 1% level of significance, indicating strong integration of Indian stock market with major world stock markets. Though, the correlation of Indian stock market is weak with NASDAQ and S&P500 of US market and also with Nikkei225 of Japanese stock market, the relationship was statistically significant as it is revealed in t-test. As shown in table 2, highest correlation was recorded between Sensex and Hang Seng and the lowest correlation was recorded between Sensex and NASDAQ. From among the US stock market indices, NYSE exhibited strong positive correlation with Sensex; Dow has showed moderate correlation. NASDAQ and S&P500 exhibited weak correlation with Sensex. In the case of Asian regional stock markets, Hong Kong market (i.e., Hangseng) and Chinese stock market (SSE Composite Index) showed strong integration with Indian stock market and Japanese stock market (i.e., Nikkei225) exhibited weak correlation with Indian stock market. Moderate correlation between Sensex and FTSE100 indicates that European Stock market is not very strongly integrated with Indian stock market.

9. STUDY OF RELATIONSHIP OF DOW JONES INDUSTRIAL AVERAGE (DJI) WITH OTHER SELECT INDICES FROM 1-1-2000 TO 31-12-2009:

To study the relationship between Dow Jones Industrial average (DJI) and other indices selected for the study, the following hypothesis has been designed.
Null Hypothesis: There is no significant relationship between Dow Jones Industrial average (DJI) and other select indices.
Alternate Hypothesis: There is a significant relationship between Dow Jones Industrial average (DJI) and other select indices.

TABLE 3: CORRELATION BETWEEN DOW JONES INDUSTRIAL AVERAGE (DJI) AND OTHER SELECT INDICES

Indices	Correlation Coefficient	Level of Correlation	T-test results		
			t-value	'p' value	Hypothesis accepted
Dow & Sensex	0.592	Moderate	4.361	0.001	H_1: Accepted
Dow & NYSE	0.960	Strong	18.497	0.001	H_1: Accepted
Dow & NASDAQ	0.539	Moderate	56.892	0.001	H_1: Accepted
Dow & S&P500	0.914	Strong	69.291	0.001	H_1: Accepted
Dow & HangSeng	0.768	Strong	-11.244	0.001	H_1: Accepted
Dow & Nikkei225	0.785	Strong	-6.973	0.001	H_1: Accepted
Dow & FTSE100	0.833	Strong	33.772	0.001	H_1: Accepted
Dow & SSE Composite index	0.614	Moderate	-51.311	0.001	H_1: Accepted

In the case of all the above indices, alternate hypothesis is accepted, indicating statistically significant

relationship between Dow Jones industrial average (DJI) and other world major indices as observed from Table-3. Dow, one of benchmark indices of US stock market, is exhibiting strong correlation with all other leading indices in the world except Sensex, NASDAQ and SSE Composite index. Dow Jones industrial average (DJI), the US stock index, is strongly correlated with other US indices (i.e., NYSE and S&P500) except NASDAQ. DJI has moderate correlation with NASDAQ. There is a strong correlation between Dow and FTSE100 which indicates close integration of US and Europe stock markets. Dow has strong correlation with Hong Kong stock market index (i.e., Hang Seng) and Japanese stock market index (i.e., Nikkei225) which indicates strong integration with stock markets of Asia pacific region. However, Dow is showing moderate correlation with BSE-Sensex and SSE Composite Index indicating moderate integration of Indian and Chinese stock markets with US stock market.

10. STUDY OF RELATIONSHIP OF NYSE COMPOSITE INDEX (NYA) WITH OTHER SELECT INDICES FROM 1-1-2000 TO 31-12-2009:

The following hypothesis has been designed to study the relationship between NYSE Composite index (NYA) and other select indices.

Null Hypothesis: There is no significant relationship between NYSE and other select indices.

Alternate Hypothesis: There is a significant relationship between NYSE and other select indices.

TABLE 4: CORRELATION BETWEEN NYSE COMPOSITE INDEX (NYA) AND OTHER SELECT INDICES

Indices	Correlation Coefficient	Level of Correlation	T-test result		
			t-value	'p' value	Hypothesis accepted
NYSE & Sensex	0.741	Strong	-2.775	0.006	H_1: Accepted
NYSE & DOW	0.960	Strong	-18.497	0.001	H_1: Accepted
NYSE & NASDAQ	0.452	Moderate	34.236	0.001	H_1: Accepted
NYSE & S&P500	0.847	Strong	45.068	0.001	H_1: Accepted
NYSE & HangSeng	0.839	Strong	-18.787	0.001	H_1: Accepted
NYSE & Nikkei225	0.749	Strong	-17.830	0.001	H_1: Accepted
NYSE & FTSE100	0.789	Strong	11.894	0.001	H_1: Accepted
NYSE & SSE Composite index	0.634	Moderate	-30.907	0.001	H_1: Accepted

The 'p' value is less than 0.05 in all the above cases. Hence, Null hypothesis is rejected and alternate hypothesis is accepted. It can be inferred from the above analysis that, the relationship of NYSE with other world major indices is statistically significant. NYSE, one of the bench mark indices of US, is exhibiting strong integration with other major indices in the world except NASDAQ and SSE Composite index. As indicated in table 4, NYSE, major US stock market index, is showing strong correlation with other US major indices i.e., DOW and S&P500, except NASDAQ. Correlation between NYSE and BSE-Sensex is strong, indicating closer integration between US and Indian stock markets. Relationship of NYSE with Hang Seng and Nikkei225 is also very strong. It clearly indicates the strong integration of stock market of US and Asia-pacific region. However, correlation between SSE Composite index and NYSE is moderate. NYSE is strongly correlated with FTSE100 indicating strong correlation of US and European stock markets.

11. STUDY OF RELATIONSHIP OF NASDAQ COMPOSITE INDEX WITH OTHER SELECT INDICES FROM 1-1-2000 TO 31-12-2009:

To study the relationship between NASDAQ Composite index and other indices selected for the study, the following hypothesis has been designed.

Null Hypothesis: There is no significant relationship between NASDAQ and other select indices.

Alternate Hypothesis: There is a significant relationship between NASDAQ and other select indices.

TABLE 5: CORRELATION BETWEEN NASDAQ COMPOSITE INDEX AND OTHER SELECT INDICES

Indices	Correlation Coefficient	Level of Correlation	T-test result		
			t-value	'p' value	Hypothesis accepted
NASDAQ & Sensex	0.164	Weak	-2.775	0.006	H_1: Accepted

NASDAQ & DOW	0.539	Moderate	-18.497	0.001	H_1: Accepted
NASDAQ & NYSE	0.452	Moderate	34.236	0.001	H_1: Accepted
NASDAQ & S&P500	0.792	Strong	45.068	0.001	H_1: Accepted
NASDAQ & HangSeng	0.466	Moderate	-18.787	0.001	H_1: Accepted
NASDAQ & Nikkei225	0.802	Strong	-17.830	0.001	H_1: Accepted
NASDAQ & FTSE100	0.771	Strong	11.894	0.001	H_1: Accepted
NADAQ & SSE Composite index	0.245	Weak	-0.646	0.519	H0: Accepted

Statistically significant relationship between NASDAQ and other world major indices is observed by accepting alternate hypothesis at 95 percent level of confidence, except with SSE Composite Index . As revealed from table 5, impact of NASDAQ is not similar on all the indices selected for the study. In America region, NASDAQ has exhibited strong correlation with S&P 500 and it has moderate correlation with other major US indices i.e., DOW and NYSE. Influence of NASDAQ on select Asia-pacific indices is not on same level. It has showed strong correlation with Japanese stock market (i.e., Nikkei225) and moderate correlation with Hong Kong stock market (i.e., Hang Seng) and weak correlation with Indian stock market (i.e., BSE-Sensex) and Chinese stock market (i.e., SSE Composite index). The correlation between NASDAQ and FTSE100 is strong which indicates closer integration of US stock market with European stock markets.

12. STUDY OF RELATIONSHIP OF S&P 500 INDEX WITH OTHER SELECT INDICES FROM 1-1-2000 TO 31-12-2009:

The following hypothesis has been designed to study the relationship between S&P 500 Index and other select indices.

Null Hypothesis: There is no significant relationship between S&P500 and other select indices.

Alternate Hypothesis: There is a significant relationship between S&P500 and other select indices.

TABLE 6: CORRELATION BETWEEN S & P 500 INDEX AND OTHER SELECT INDICES

Indices	Correlation Coefficient	Level of Correlation	T-test result		
			t-value	'p' value	Hypothesis accepted
S & P500 & Sensex	0.386	Weak	-15.582	0.001	H_1: Accepted
S & P500 & DOW	0.914	Strong	-69.291	0.001	H_1: Accepted
S & P500 & NYSE	0.847	Strong	-45.068	0.001	H_1: Accepted
S & P500 & NASDAQ	0.792	Strong	-16.011	0.001	H_1: Accepted
S & P500 & HangSeng	0.653	Moderate	-32.983	0.001	H_1: Accepted
S & P500 & Nikkei225	0.913	Strong	-39.746	0.001	H_1: Accepted
S & P500 & FTSE100	0.946	Strong	-50.073	0.001	H_1: Accepted
S&P500 & SSE Composite index	0.451	Moderate	9.663	0.001	H_1: Accepted

In all the above cases, 'p' value is lesser than 0.01 which clearly indicates a significant relationship between S & P 500 and other world major indices. Level of correlation is strong between S & P 500 and other major indices in the world except BSE-Sensex, Hang Seng and SSE Composite index. It indicates stronger integration of S & P 500 with other major world indices. Observation of table 6 reveals that, S&P500, one of the US bench market indices, is showing strong correlation with other major indices in US i.e., DOW, NYSE and NASDAQ. S&P500 index has different levels of correlation with the major stock market indices in Asia-pacific region. S &P 500 has exhibited strong correlation with Japanese stock market index (i.e., Nikkei225); it has maintained

moderate correlation with Hong Kong stock market index (i.e., Hang Seng) and Chinese stock market (i.e., SSE Composite Index). It has showed weak correlation with Indian stock market index (i.e., BSE-Sensex). There is strong correlation between S&P500 and FTSE100 which indicates strong integration of stock markets of US and Europe.

13. STUDY OF RELATIONSHIP OF HANG SENG INDEX WITH OTHER SELECT INDICES FROM 1-1-2000 TO 31-12-2009:

To study the relationship between Hang Seng index and other indices selected for the study, the following hypothesis has been designed.
Null Hypothesis: There is no significant relationship between Hang Seng and other select indices.
Alternate Hypothesis: There is a significant relationship between Hang Seng and other select indices.

TABLE 7: CORRELATION BETWEEN HANG SENG INDEX AND OTHER SELECT INDICES

Indices	Correlation Coefficient	Level of Correlation	T-test result		
			t-value	'p' value	Hypothesis accepted
Hang Seng & Sensex	0.912	Strong	11.377	0.001	H_1: Accepted
Hang Seng & DOW	0.768	Strong	11.244	0.001	H_1: Accepted
Hang Seng & NYSE	0.839	Strong	18.787	0.001	H_1: Accepted
Hang Seng & NASDAQ	0.466	Moderate	30.437	0.001	H_1: Accepted
Hang Seng & S&P500	0.653	Moderate	32.983	0.001	H_1: Accepted
Hang Seng & Nikkei225	0.555	Moderate	5.570	0.001	H_1: Accepted
Hang Seng & FTSE100	0.661	Moderate	23.325	0.001	H_1: Accepted
Hang Seng & SSE Composite index	0.844	Strong	30.191	0.001	H_1: Accepted

Since, 'p' value is less than 0.01 in all the above cases, null hypothesis is rejected and alternate hypothesis is accepted stating that there is a significant relationship between Hang Seng and other world major indices. Hang Seng has strong correlation with Indian stock market index (i.e., BSE-Sensex), Dow and NYSE and it has moderate correlation with NASDAQ, S&P500, Nikkei225 and FTSE100. Level of correlation of HangSeng is not the same with major stock market indices in US. It has maintained strong correlation with Dow and NYSE and moderate correlation is exhibited with NASDAQ and S&P500. In Asia-pacific region, Hang Seng has maintained strong correlation with BSE-Sensex and SSE Composite Index and moderate correlation with Nikkei225.

13. STUDY OF RELATIONSHIP OF NIKKEI225 INDEX WITH OTHER SELECT INDICES FROM 1-1-2000 TO 31-12-2009:

Hypothesis designed to study the relationship between Nikkei225 index and other select indices is:
Null Hypothesis: There is no significant relationship between Nikkei225 and other select indices.
Alternate Hypothesis: There is a significant relationship between Nikkei225 and other select indices.

TABLE 8: CORRELATION BETWEEN NIKKEI225 INDEX AND OTHER SELECT INDICES

Indices	Correlation Coefficient	Level of Correlation	T-test result		
			t-value	'p' value	Hypothesis accepted
Nikkei 225 & Sensex	0.336	Weak	7.920	0.001	H_1: Accepted
Nikkei 225 & DOW	0.785	Strong	6.973	0.001	H_1: Accepted
Nikkei 225 & NYSE	0.749	Strong	17.830	0.001	H_1: Accepted
Nikkei 225 & NASDAQ	0.802	Strong	35.605	0.001	H_1: Accepted
Nikkei 225 & S&P500	0.913	Strong	39.746	0.001	H_1: Accepted
Nikkei 225 & HangSeng	0.555	Moderate	-5.570	0.001	H_1: Accepted
Nikkei 225 & FTSE100	0.901	Strong	24.834	0.001	H_1: Accepted
Nikkei225 & SSE Composite index	0.332	Weak	-34.801	0.001	H_1: Accepted

By accepting alternate hypothesis, it can be inferred that there is a significant relationship between Nikkei225 and other world major indices. This indicates close integration of Japanese stock market with other major stock markets in the world. As shown in the Table-8, Nikkei has strong correlation with all the major indices in the world except, BSE-Sensex, Hang Seng and SSE Composite index. Nikkei225, major stock market index in Japan, has not maintained the same level of integration within Asia pacific region. It has exhibited weak correlation with Indian stock market (i.e., BSE-Sensex), and Chinese stock market (i.e., SSE Composite index). It has exhibited moderate correlation with Hong Kong stock market (i.e., Hang Seng). Nekkei225 has showed strong correlation with all major indices in US stock market and European stock market.

14. STUDY OF RELATIONSHIP OF FTSE 100 WITH OTHER SELECT INDICES FROM 1-1-2000 TO 31-12-2009:

The relationship between FTSE 100 and other indices is tested with the following hypothesis:
Null Hypothesis: There is no significant relationship between FTSE 100 and other select indices.
Alternate Hypothesis: There is a significant relationship between FTSE 100 and other select indices.

TABLE 9: CORRELATION BETWEEN FTSE 100 AND OTHER SELECT INDICES

Indices	Correlation Coefficient	Level of Correlation	T-test result		
			t-value	'p' value	Hypothesis accepted
FTSE 100 & Sensex	0.410	Moderate	-6.683	0.001	H_1: Accepted
FTSE 100 & DOW	0.833	Strong	-33.772	0.001	H_1: Accepted
FTSE 100 & NYSE	0.789	Strong	-11.894	0.001	H_1: Accepted
FTSE 100 & NASDAQ	0.771	Strong	30.893	0.001	H_1: Accepted
FTSE 100 & S&P500	0.946	Strong	50.073	0.001	H_1: Accepted
FTSE 100 & HangSeng	0.661	Moderate	-23.325	0.001	H_1: Accepted
FTSE 100 & Nikkei225	0.901	Strong	-24.834	0.001	H_1: Accepted
FST 100 & SSE Composite index	0.480	Moderate	-25.475	0.001	H_1: Accepted

Significant relationship between FTSE100 and other world major indices is proved by accepting alternative hypothesis at 0.01 level of significance. This clearly indicates the stronger correlation of European stock markets with major stock markets in the world. FTSE100 has exhibited strong correlation with all the major indices in the world except with BSE-Sensex, Hang Seng and SSE Composite index. As observed from table 9, FTSE100, major stock market index in UK, has exhibited strong correlation with all major stock market indices in US i.e., DOW, NYSE, NASDAQ and S & P 500. It indicated stronger integration of European stock market with US stock market. Level of correlation provided by FTSE100 with major stock market indices in Asia-pacific region is not the same for all the indices in this region. FTSE100 has exhibited strong correlation with Japanese stock market index (i.e., Nikkei225); it has showed moderate correlation with Indian stock market Index (i.e., BSE-Sensex), Hong Kong stock market index (i.e., Hang Seng) and Chinese stock market index(i.e., SSE Composite Index).

15. STUDY OF RELATIONSHIP OF SSE COMPOSITE INDEX WITH OTHER SELECT INDICES FROM 1-1-2000 TO 31-12-2009:

The relationship between SSE Composite index and other indices is tested with the following hypothesis:
Null Hypothesis: There is no significant relationship between SSE Composite index and other select indices.
Alternate Hypothesis: There is a significant relationship between SSE Composite index and other select indices.

TABLE 10: CORRELATION BETWEEN SSE COMPOSITE INDEX AND OTHER SELECT INDICES

Indices	Correlation Coefficient	Level of Correlation	T-test result		
			t-value	'p' value	Hypothesis accepted
SSE & Sensex	0.764	Strong	-13.307	0.001	H_1: Accepted
SSE & DOW	0.614	Moderate	-51.311	0.001	H_1: Accepted
SSE & NYSE	0.634	Moderate	-30.907	0.001	H_1: Accepted

SSE & NASDAQ	0.245	Weak	-0.646	0.519	H0: Accepted
SSE & S&P500	0.451	Moderate	9.663	0.001	H_1: Accepted
SSE & HangSeng	0.844	Strong	-30.191	0.001	H_1: Accepted
SSE & Nikkei225	0.332	Weak	-34.801	0.001	H_1: Accepted
SSE & FST 100	0.480	Moderate	-25.475	0.001	H_1: Accepted

As indicated in table 10, SSE Composite index has exhibited strong correlation with BSE- Sensex and Hang Seng and moderate correlation with all the US stock market indices except with NASDAQ. It indicates that Chinese stock market is not closely associated with US stock market. Correlation between SSE Composite Index and FTSE100 is moderate which indicates that there is no strong relationship between Chinese stock market and European stock market. Weak correlation between SSE Composite Index and Nekkie225 indicates poor integration of Chinese stock market with Japanese stock market.

CONCLUSIONS:

The results of this study strongly support the view that, there is a substantial integration between Indian and International financial markets. BSE-Sensex has witnessed a greater fluctuation which has been indicated by a very high Co-efficient of variation compared to other select indices. Sensex, the Indian bench mark index, has shown strong association with NYSE, Hang Seng and SSE Composite Index. The study reveals that, there is a poor integration of BSE- Sensex with NASDAQ, Nikkei225 and S&P500. Indian stock market exhibited strong positive correlation and perfect price correlation with global stock markets. In Asia pacific region, when compared to Hang kong and Japan, correlation of the Indian market with global markets is not so attractive. Chinese stock index i.e., SSE Composite index has exhibited strong correlation with BSE- Sensex and with Hang Seng. Japanese stock index i.e., Nikkei225 has strong integration with world major stock markets. It has strong correlation with all the select indices except Sensex, HangSeng and SSE Composite index. The European index i.e., FTSE100 has exhibited strong correlation with all the US stock market indices and with Nekkei225, the Japanese stock market index.

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