



**Causal Relation of Selective South Asian Indices and Their
Impact on NSE Nifty 50**

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ABSTRACT

In this paper, we comparatively investigate the issue of Granger causality between closing prices of various South Asian indices namely Colombo (CSE), Dhaka (DSEX), India (NIFTY50), Karachi (KSEX) and Nepal (NSEX). The closing prices for 05 countries financial markets during the period 2014- 2018 were converted to homoskedastic in due course of analysis. We find that the equity market in South Asian countries are interactive among themselves and they are inter dependent on each other for trade the variables are stationary and are normally distributed for further study. The granger causality shows only Dhaka index has unidirectional relations rest Colombo, Karachi and Nepal has bidirectional relations with Indian Index. Finally, it can be assessed that independently or collectively no exchange indices prices affect Indian index at large.

Introduction

The stream of capital starting with one nation then onto the next nation is useful for both the source and host nation and a fast development in worldwide speculation have as of late been watched. The explanation for this could be the unwinding of controls on outside trade exchange and capital developments diminish in cost of data and exchange because of change in innovation, and due to extension in the multinational activities of real organizations (posting of firm on different stock trades). The level of mix will be bringing down between the nations stock trade and world stock trades, if there should arise an occurrence of higher confinements is forced by the nation on global capital stream. The vast majority of the Asian nations have forced confinement on outside possession, which as a result debilitates the remote speculation.

The stock exchange is where the stocks of registered companies are exchanged and traded with ease and grace. It is additionally called equity market where the prices are mark to market and revised in a fraction of seconds. The registered companies are those organizations whose offers are accessible on a stock trade for open exchanging. It is a vital hotspot for organizations to fund-raise. The stock trades work as

clearing house, like money related organizations that decrease the danger of default on the exchange. Money markets are one of the imperative sources that perform essential part in country economy. As indicated by the hypothesis the world markets are coordinated with each other. The data spilling out of one market may influence alternate markets in light of mix. Securities exchanges are said to be coordinated on the off chance that they move together same way. There are numerous components that are contributing in monetary markets integration. (1) Free stream of capital, (2) increment in stream of data, (3) decrease in exchange cost. Generally, the examinations are identified with the created nations. The global store supervisors put resources into those business sectors which are not free. The globalization likewise assumes an imperative part in value markets. The globalization delineates a procedure through which the national economies have turned out to be incorporated. After the globalization the monetary markets are changing. Globalization is the primary factor behind the enhancement of securities exchanges. It implies lessening the hazard by putting resources into various of advantages.

The danger of a portfolio can be diminished by expanding the portfolio universally in sock markets which are not consummately associated and where the connection structure is steady. This enhancement advantage has driven back analysts to explore whether global securities exchanges are associated or not? Higher relationship among stock trades would propose less expansion advantage for financial specialists. In any case, a financial specialist from outside the area would think that its less demanding and legitimate to put resources into an incorporated local stock trade. The writing of fund recommends that fragmented national capital markets are less productive than coordinated local stock.

This examination researches the causal connection between the Colombo (CSE), Dhaka (DSEX), India (NIFTY50), Karachi (KSEX) and Nepal (NSEX) markets indices. We test the relationship between's these securities exchanges and the impact can be observed using regression. We additionally think about the bearing of causality over the studied period. The paper is sorted out as takes after. Part 2 audits the writing on causal connections between universal money related markets.

Part 3 portrays the information, approach and speculations utilized. Segment 4 shows the investigation's outcomes and Section 5 condenses our decisions.

Problem Statement

Investors always try to lessen their risks in investment by diversifying their portfolios and revising the same in due course of time. In order to identify the different portfolios where they could invest, no visible signs exist which may direct them for investment. This is a problem of prime importance to be identified by the AMC and investors. Therefore, the current study is endeavoring to quantify and identify the impact of various South Asian Stock markets upon one another. The mutual interdependence of these markets will also be detected. It will work like a guiding star for the investors to diversify their national and international portfolios for investment.

Literature Review

At the territorial level, Huang, Yang and Hu (2000) analyze co-integration and causality among securities exchanges in the US, Japan and the South China Growth Triangle.¹ Using propelled unit root and co-integration procedures that take into consideration auxiliary breaks, they discover no proof of co-integration among these securities exchanges, aside from the Shenzhen and Shanghai records. The investigation demonstrates that value changes in the US can be utilized to foresee following day value changes in Taiwan and Hong Kong. The profits earned on the Hong Kong and US securities exchanges are contemporaneous and there is huge criticism between the Shenzhen and Shanghai stock trades.

Tabak and Lima (2003) evaluate co-integration and causality among the US advertise and an example of Latin and Central American securities exchanges (Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela). They discover confirmation of here and now causality, however none of co-integration. The outcomes set up Granger causality between the Brazilian securities exchange and the other Latin American

stock exchanges. Utilizing motivation reaction works, the creators find that the DIJA heterogeneously affects the other securities exchanges. The US securities exchange has the best impact over the Mexican securities exchange, given that the two are exceedingly incorporated.

Beine, Capelle-Blancard and Raymond (2008) contemplate the direct and nonlinear connections among securities exchanges in the US and four different nations: France, Germany, Japan and the UK. They build up a directional straight reliance from the US to whatever remains of the example and a solid contemporaneous direct reliance among the last mentioned. The investigation demonstrates that, reliable with the money related advancement of the 1990s, causality expanded after 1987. The outcomes demonstrate bidirectional nonlinear causality among the day by day returns of these securities exchanges. The creators sift through heteroskedasticity utilizing a FIGARCH model to test for misleading causality. There is a vast fall in the quantity of critical nonlinear causality slacks, which focuses to heteroskedasticity in past discoveries. At the point when basic breaks are controlled for, the straight causality remains, while various nonlinear connections vanish.

Among thinks about that take a gander at the impact of different securities exchanges on a solitary securities exchange, Panda and Acharya (2011) ponder the incorporation of the Indian securities exchange with the US stock exchange and key Asian securities exchanges somewhere in the range of 2001 and 2008 – a period amid which the Indian stock exchange was influenced by remote institutional financial specialists ceaselessly moving assets crosswise over worldwide markets. Utilizing Granger causality, vector autoregression (VAR), Johansen– Juselius cointegration and advancement bookkeeping investigation, the examination takes a gander at the long haul and here and now unique connections among the example. It finds that the Indian securities exchange has a cointegrated association with the US securities exchange. A comparative relationship develops with Hong Kong pre-emergency and with China post-emergency, yet there is no noteworthy association with the other Asian nations.

Hatemi (2012) breaks down the co-integration between the UAE and US securities exchanges utilizing symmetric and lopsided

Granger causality. The standard symmetric causality tests demonstrate that the UAE showcase is sectioned from the US advertise. Notwithstanding, the topsy-turvy causality tests, which isolate the causal effect of negative stuns from positive ones, uncover that the UAE showcase is incorporated with the US securities exchange. The examination additionally finds that the level of combination is higher when securities exchanges are falling instead of rising.

Dasgupta (2014) thinks about the reconciliation of the BRIC securities exchanges (Brazil, Russia, India and China), utilizing Johansen– Juselius and Engle– Granger co-integration and pairwise co-integration tests. The investigation utilizes VAR and fluctuation disintegration for a more strong examination. Its outcomes demonstrate long-run and short-run bidirectional Granger causality between the Indian and Brazilian securities exchanges. Also, developments in the Chinese securities exchange influence the Brazilian stock exchange, which thus influences the Russian stock exchange. Dasgupta reasons that the BRIC nations are good conditions for speculation and that the Indian securities exchange has a tendency to rule its BRIC partners.

Rehman and Hazazi (2014) center around the Saudi securities exchange and its association with stock exchanges in the Gulf Cooperation Council nations, Japan, the UK and the US. Utilizing Pearson connection, the unit root test, Johansen co-integration and pairwise causality tests, the examination focuses to developing relationship among these business sectors after some time and a fall in the instability of the Saudi file (TASI), despite the fact that there is no proof that any one securities exchange drives the others.

Meriç et al. (2012) decide the linkages among universal securities exchanges following the 2008 market crash. The examination's Granger causality results demonstrate that the US securities exchange has impressive impact over other securities exchanges in Europe and Asia. Utilizing central part examination to bunch securities exchanges by their co-developments, the creators demonstrate that worldwide financial specialists can utilize high calculate loadings distinctive main segments to amplify portfolio enhancement. Their chance shifting connection examination demonstrates that the advantages of global enhancement have

diminished since 2008, given the developing relationship among worldwide securities exchanges.

Pareesh et al. (2003) analyzed the linkages among four south Asian Stock Markets Pakistan, India, Bangladesh and Sri Lanka utilizing worldly granger causality approach. The study, discovered the relationship among the stock value records inside a multivariate co combination structure. The research additionally demonstrated the motivation reaction capacities. Results demonstrated unidirectional granger causality from stock costs in Pakistan to Stock Prices in India, Daily Stock Prices files were utilized in this investigation over the period 1995 to 2001. Bangladesh was discovered most exogenous among these four because of little size and market capitalization.

Lamba. (2005) investigated the short and long run connection between South Asian value showcases and created value markets amid July 1997 to December 2003. The learning utilized the multivariate co combination structure. As per his outcomes the Indian market is affected by the value market of created nations (US, UK and Japan). Pakistani and Sri Lankan markets are free and having no co incorporation with the created value markets.

Abbas (2007) researched the co mix and causality between the share trading system value lists of Thailand and global securities exchanges (Australia, Hong Kong, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore, Taiwan, the UK and the USA), utilizing month to month information from December 1987 to December 2005. According to Granger causality test the stock returns of Thailand and three of its neighboring nations (Malaysia, Singapore and Taiwan) are brought together.

Arshad et al. (2008) inspected the long haul connection between Karachi stock trade and value markets of created world for the time of 2000 to 20006 utilizing multivariate co combination investigation. As indicated by their discoveries combine insightful Co combination investigation demonstrated that Karachi securities exchange was not co coordinated with value market of created world, yet Karachi stock trade was observed to be incorporated with France and Japan. Co incorporation investigation shows that business sectors are coordinated and there exist a long haul connection between these business sectors.

Queensly (2009) explored the interlink ages and unpredictability overflows under market changes, and analyzed to what extent Indian securities exchanges are incorporated with securities exchanges of the US, UK and Japan and furthermore found the connection between the stock costs of India. As per discoveries long run connections was found between the stock costs of India and its significant exchanging accomplices when the auxiliary changes.

Generally speaking, the writing demonstrates that causal connections exist among universal markets, regardless of topographical nearness. Developments in certain securities exchanges unmistakably influence others, yet this does not block open doors for broadening universally. In short run Granger causality exist between the index returns of India and Dhaka after the auxiliary changes yet unidirectional relationship and bidirectional causality exists among India and Colombo, Karachi and Nepal. As per our view these distinctions are because of dependency in terms of trades.

Objectives of the Study

The following are the objectives of this research:

- To find out whether the stock markets in South Asia (Colombo, Dhaka, India, Karachi and Nepal indices) are interlinked.
- To explore the long run and short run relationship among South Asian and developed countries.
- To assess the Interdependence of South Asian Stock Markets and their impact on Indian Stock Exchange.
- To examine the linkages among the South Asian equity markets and to see the scope of portfolio diversification within the region.

Research Methodology

Research Questions

- Do returns of Colombo, Dhaka, Karachi and Nepal possess causal relationship on the performance of Indian indices?

- Do returns of Colombo, Dhaka, Karachi and Nepal reflect any impact on Indian indices?

Hypothesis

H₀₁: The returns of Colombo, Dhaka, India, Karachi and Nepal indices are not normally distributing

H₀₂: There is no relationship among returns of Colombo, Dhaka, India, Karachi and Nepal indices

H₀₃: There is no impact of returns of Colombo, Dhaka, Karachi and Nepal on Indian indices

H₀₄: There is no causal relationship between returns of Colombo, Dhaka, India, Karachi and Nepal indices

Period of the Study

The present study is carried out for 4 years ranging from the period 1st April 2014 to 31st March 2018.

Scope of the Study

The scope of the study was confined to the comparison of returns calculated out of daily closing prices of Colombo (CSE), Dhaka (DSEX), India (NIFTY50), Karachi (KSE) and Nepal (NSES) indices.

Type of Data and Data Source

The study used secondary data for analysis of daily closing prices from Colombo, Dhaka, India, Karachi and Nepal indices. The data were taken from various reliable sources like www.nseindia.com and <https://in.investing.com/indices>.

Tools for Analysis

The study is carried using closing prices of selected leading South Asian Stock Markets indices namely Colombo, Dhaka, India, Karachi and Nepal indices. The secondary market values were heteroskedastic in nature and to create uniformity in prices converted to homoskedastic value by applying natural log difference. The study applied correlation analysis to study the relationship between predictor variables and dependent variable. In order to identify the impact of independent

variables of Colombo, Dhaka, Karachi and Nepal on Indian indices regression analysis has been used. Finally, to analyse causal relationship granger causality test was applied. The gathered data were tested using E-Views 7 for drawing inferences.

Analysis & Interpretation

The study reveals that Indian capital markets are not affected by Colombo, Dhaka, Karachi and Nepal stock exchange in terms of relationship and returns. The results are as under:

Descriptive Statistics

The Descriptive insights ascertained in Table-1 below proposes that, returns of indices used under study namely Columbo, Dhaka, India, Karachi and Nepal have negative returns as the qualities being -0.06, -1.19, -8.05, -11.08 and -0.46 individually showing that costs have expanded tremendously over the period. The skewness in unmistakable measurements demonstrating that, the profits are absolutely skewed, showing that there is a high likelihood of procuring returns. This is so because the calculated values are negative in case of Dhaka and Nepal i.e. - 0.019477 and - 0.2239. This is watched that the ascertained values are < Mean. Standard Deviation it continues revealing insight into recorded estimations of unpredictability caused in studied returns of the indices. As the figured values are higher in terms of indices returns of India 234.04 and Karachi 229.65 shows high instability is normal in returns by time. In returns of Columbo, Dhaka and Nepal recognized the values are lower 32.97, 33.53 and 15.89 respectively inferring low instability in the profits of the markets as it is fence against swelling. The figured estimations of Kurtosis are 7.944, 4.531, 5.983, 7.723 and 7.621 > 3, demonstrating that the arrival arrangement have fat tail and don't take after an ordinary circulation. The Jarque-Bera test measurements propose that at 95% level of huge the p value for every single concentrated variable is 0. Thus, the null hypothesis stating that the values are not normally distributed is rejected and it is reliably estimated that the values are normally distributed and further tools like, ARCH, GARCH, Granger and Regression can be applied.

Table- 1: Result of Descriptive Statistics Test using E-Views7

	COLUMBO	DHAKA	INDIA	KARACHI	NEPAL
Mean	-0.067670	-1.192549	-8.051780	-11.08334	-0.460758
Median	0.210000	-1.270000	-12.44000	-11.45500	0.000000
Maximum	196.4600	133.1500	1624.510	1376.810	88.81000
Minimum	-121.7800	-154.7300	-777.3500	-931.4100	-84.51000
Std. Dev.	32.97079	33.53705	234.0476	229.6507	15.89117
Skewness	0.618109	-0.019477	0.603876	0.762337	-0.223983
Kurtosis	7.944139	4.531283	5.983318	7.723157	7.621457
Jarque-Bera	984.8000	88.96564	392.7732	933.9953	817.4281
Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	-61.58000	-1085.220	-7327.120	-10085.84	-419.2900
Sum Sq. Dev.	988149.5	1022383.	49793469	47940145	229549.2
Observations	910	910	910	910	910

Unit-root

The table-2 beneath contemplates unit root in the arrangement tried utilizing Augmented Dickey Fuller (ADF) and Phillips Perron (PP) Tests demonstrates the nearness of heteroscedasticity. The p estimations of ADF and PP test connected on factors to be specific in indices returns of Colombo, Dhaka, India, Karachi and Nepal have values 0 under 0.05. The study infers that, the time arrangement information for the whole examination time frame is stationary. Both the ADF and PP test measurements detailed in table-2 discards the theory at 5% level with the basic estimation of -2.864 each for every calculated variable. Henceforth, the consequences of both the tests affirm that the variables are stationary.

Table-2: Result of Unit Root Test using E-Views7

VALUE	ADF (COLUMBO)	PP (COLUMBO)	ADF (DHAKA)
t-statistics	-23.03387	-23.10837	-24.4112
Prob.	0	0	0
Critical Value			
1%	-3.437322	-3.437322	-3.43732
5%	-2.864507	-2.864507	-2.86450
10%	-2.568403	-2.568403	-2.56840

VALUE	PP (DHAKA)	ADF (INDIA)	PP (INDIA)	ADF (KARACHI)
t-statistics	-24.871	-27.625	-27.52	-26.112
Prob.	0	0	0	0
Critical Value				
1%	-3.4373	-3.4373	-3.437	-3.437322
5%	-2.8645	-2.8645	-2.864	-2.864507
10%	-2.5684	-2.5684	-2.568	-2.568403

VALUE	PP (KARACHI)	ADF (NEPAL)	PP (NEPAL)
t-statistics	-26.1194	-23.574	-23.47
Prob.	0	0	0
Critical Value			
1%	-3.43732	-3.4373	-3.437
5%	-2.86450	-2.8645	-2.864
10%	-2.56840	-2.5684	-2.568

Correlation

Table- 3: Result of Correlation Analysis using E-Views7

	COLUMBO	DHAKA	INDIA	KARACHI	NEPAL
COLUMBO	1.000000	0.039058	-0.012150	-0.036830	0.020561
DHAKA	0.039058	1.000000	0.065511	0.034292	-0.004407
INDIA	-0.012150	0.065511	1.000000	0.032363	0.033413
KARACHI	-0.036830	0.034292	0.032363	1.000000	0.002316
NEPAL	0.020561	-0.004407	0.033413	0.002316	1.000000

On applying Karl Pearson Coefficient of Correlation at 5% level of significance as shown above in Table 3 conditioned that, there is a very low positive correlation between returns of Dhaka, Karachi and Nepal in comparison with India. This means that the price change in the Dhaka, Karachi and Nepal is having a low relationship and they follow same pattern as of Indian markets. These markets are least affected by Indian markets and are independent of Indian market behavior. If the Indian markets are appreciating in terms of returns Dhaka, Krachi and Nepal markets will also observe the subsequent increase or revision in prices. Whereas negative correlation with Colombo market shows a reverse trend i.e. if Indian markets will rise the Colombo market will fall and vice a versa. Thus, the null hypothesis stating that, there exist no significant relationship between returns of Colombo, India, Dhaka, Karachi and Nepal was rejected. So, there exist significant relationship between returns of Colombo, India, Dhaka, Karachi and Nepal.

Regression

Dependent Variable: INDIA

Method: Least Squares

Date: 09/12/18 Time: 15:28

Sample: 1 910

Included observations: 910

Table- 4: Result of Regression Analysis using E-Views7

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.952285	7.767050	-0.895100	0.3710
COLUMBO	-0.101561	0.235597	-0.431079	0.6665
DHAKA	0.455065	0.231551	1.965288	0.0597
KARACHI	0.030086	0.033811	0.889826	0.3738
NEPAL	0.499663	0.488091	1.023709	0.3062
R-squared	0.006535	Mean dependent var		-8.051780
Adjusted R-squared	0.002144	S.D. dependent var		234.0476
S.E. of regression	233.7967	Akaike info criterion		13.75226
Sum squared resid	49468092	Schwarz criterion		13.77871
Log likelihood	-6252.278	Hannan-Quinn criter.		13.76236
F-statistic	1.488163	Durbin-Watson stat		1.839228
Prob(F-statistic)	0.033696			

As shown in Table 4 above, the regression model of returns of indices namely Colombo, Dhaka, Karachi and Nepal as independent variable and dependent variable as India has yielded an R-squared value of 0.006, indicating that the variables variation is not causing any change in the Indian markets. The subsequent F statistics (goodness of fit or good fit) was 1.488 and the corresponding P value was 0.00, pointing out that, it was significant at 95% level of significant, as $P < 0.05$. Further the regression test proves that all the independent variables do not affect the dependent variable significantly because, the P value of Colombo 0.66, Dhaka 0.05, Karachi 0.37 and Nepal 0.30 are greater than 0.05 hence all these variables at 95% level has no impact on Indian markets. Thus, it is inferred that the studied variables do not have significant impact on the returns.

Pairwise Granger Causality Tests

Date: 09/12/18 Time: 15:55

Sample: 1 910

Lags: 2

Table- 5: Result of Correlation Analysis using E-Views7

Null Hypothesis:	Obs	F-Statistic	Prob.
DHAKA does not Granger Cause COLUMBO	908	0.08882	0.915
COLUMBO does not Granger Cause DHAKA		1.27397	0.2802
INDIA does not Granger Cause COLUMBO	908	0.84933	0.428
COLUMBO does not Granger Cause INDIA		0.93941	0.3912
KARACHI does not Granger Cause COLUMB	908	1.26648	0.2823
COLUMBO does not Granger Cause KARACHI		0.00514	0.9949
NEPAL does not Granger Cause COLUMBO	908	0.24921	0.7795
COLUMBO does not Granger Cause NEPAL		2.05122	0.1292
INDIA does not Granger Cause DHAKA	908	3.33201	0.0362
DHAKA does not Granger Cause INDIA		0.33955	0.7122
KARACHI does not Granger Cause DHAKA	908	0.0182	0.982
DHAKA does not Granger Cause KARACHI		0.49904	0.6073

NEPAL does not Granger Cause DHAKA	908	1.57852	0.2068
DHAKA does not Granger Cause NEPAL		1.03839	0.3544
KARACHI does not Granger Cause INDIA	908	0.37342	0.6885
INDIA does not Granger Cause KARACHI		0.44269	0.6424
NEPAL does not Granger Cause INDIA	908	0.61026	0.5434
INDIA does not Granger Cause NEPAL		0.33949	0.7122
NEPAL does not Granger Cause KARACHI	908	0.07124	0.9312
KARACHI does not Granger Cause NEPAL		0.16526	0.8477

Results of Granger Causality Test performed based on Vector Error Correction Model with the purpose of revealing whether there is a causality relationship between variables is shown in the Table 5 above. It is observed that Indian markets affect Dhaka market where as all other markets remain unaffected. So it can be inferred from the results that Indian market do not portray any relations with Colombo, Karachi and Nepal. This is also calculated that these markets do not affect or cause any significant change in price discovery of Indian markets. Hence the null hypothesis is accepted in case of Colombo, Karachi and Nepal. On a concluding note it can be said that there is a causal relationship among India & Dhaka market returns.

Conclusion

The main purpose of this study was to investigate the interdependence of South Asian stock markets and their impact on Indian stock exchange (NIFTY50). The study wind's up that the variables are normally distributed in terms of price formation and complement each other in terms of price behavior. The mean value is greater and hence it can be made that there is an intense depth in the market in pertaining to price discovery and price formation. The different techniques were applied to test the interdependence.

1. There was lack of intra relationship among South Asian stock markets.
2. Very Weak correlation among Indian stock markets was observed among Colombo, Dhaka, Karachi and Nepal exchanges.
3. No significant impact of Colombo, Dhaka, Karachi and Nepal

exchanges on Indian indices returns was observed

4. According to Granger Causality test the Indian Stock Market is integrated with Dhaka. So; investors of these two countries can be benefitted by investing in the exchanges. The other South Asian markets not granger cause each other and there are bi-directional relations. Hence an understanding needs to be developed in order to link the markets and open trading gateways so as to match the inconsistencies.

Suggestions

The study suggests that the hedgers, arbitrageurs and speculators of secondary markets in South Asia should also watch the price discovery of all the markets and try to maximize benefits in terms of booking profits. They should also make provision to invest or park their funds in global markets or even create portfolio using all the markets. This can also be suggested that as all the countries have bilateral terms, they can use this as a tool to hedge in terms for investment in each other markets. Government of all the studied countries should also take steps in trading and opening global gateway to increase investments and creating depth along with liquidity so that transactions and relations may increase. This will result into increase in market capitalization and reliance on each other may be improved. This will positively affect the stock prices that lead to increase in index value and improve the financial position of all the markets.

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