Comovement of stock markets after the first COVID wave: a study into five most affected countries

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Abstract

Purpose – The purpose of this paper is to look at the contemporaneous movement of the stock market indices of the five most COVID-infected countries, namely, the USA, Brazil, Russia, India and UK after the first wave along with market indices of the three least affected countries, namely, Hong Kong, South Korea and New Zealand during the first wave.

Design/methodology/approach – Data have been collected from the website of Yahoo finance on daily closing values of five indices. Augmented Dickey–Fuller test with its three forms has been applied to check the stationarity of the select five indices at the level and at the first difference before the pandemic, during the pandemic and post-first wave of the pandemic. Johansen cointegration test is applied to find out that there is no cointegration among the select five indices.

Findings – The five countries do neither fall in the same economic and political zone nor do they have the same economic status. But during the period of pandemic and the new-normal period, the cointegration is very distinct. The developing and developed nations thus stood at an indifferentiable stage of the economic crisis which is well reflected in their stock markets. However, the least three COVID-affected countries do not show any cointegration during the pandemic time.

Originality/value – The comovement even seen during the normal time in the other studies is not compared to a similar period in earlier years. But, in this study to look into the exclusive effect of COVID pandemic, the period most affected with it is compared with the period after it and that in the immediate past year had no effect.

Keywords Augmented Dickey–Fuller (ADF) test, Cointegration, Johansen cointegration test, Stock market indices

Paper type Research paper

1. Introduction

The topic “infectious diseases” was ranked tenth in terms of impact in the World Economic Forum’s Global Risk Report 2020 (published on 15 January 2020), but only a few weeks later attention shifted dramatically. From the city of Wuhan in China, the unknown virus emerged to destroy the whole world – literally and economically. It was named COVID (coronavirus disease)-2019 after the name of the disease as the virus resembles the shape of a crown. It has first been noticed during the end of 2019 after which very recently from 2021 March-end the world has started to face the second wave. India is the worst affected country in this phase of the pandemic after a three-month comparative controlled state of the disease at the end of its first wave.

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The classification of the countries in terms of the stage of economic development, developed and developing is simply swept away by its invasion and destruction. On 9 October 2020, a total of 36,542,723 cases are confirmed in more than 227 countries. There are 10,003,011 active cases and 1,062,360 deaths [Source: Wikipedia]. The world economy was shattered due to lockdowns imposed across the world. The economic activities went to the nadir, showing no quick or clear hope of recovery. The world progressed towards recession and therefrom to depression.

On 24 February 2020, a Monday, the Dow Jones Industrial Average and FTSE 100 dropped more than 3% with the news of the outbreak of the coronavirus outside China over the weekend. On the morning of 9th March, the S&P 500 fell 7% in 4 min after the exchange opened, triggering a circuit breaker for the first time since the financial crisis as stated above. On 12th March, the Asia–Pacific stock markets closed down. Nikkei 225, the Tokyo Stock Exchange index fell to more than 20% below its 52-week high. The European stock markets closed down after getting declined by 11% as their worst decline in history. The S&P 500 was down by 9.5% leading to activation of the trading curb at the New York Stock Exchange for the second time during that week. Overall, stock markets declined over 30% by March 2020 [Source: Wikipedia].

There exists a large number of studies which measures the comovements of different stock markets all over the world that are expected to be interlinked and sensitive if the countries belong to the same economic or political zone or economic status during the normal time period, namely, Parker and Rapp (1998), Johnson and Soenen (2009), Sen (2011), Azizi *et al.* (2016), Deo and Prakash (2017) etc. The present paper looks into the contemporaneous movement of the stock market indices of the five most COVID-infected countries, namely, USA, Brazil, Russia, India and UK, which changed the rank in a number of infections but remained in top five in the world till the middle of June 2020. The extent of linkages can be an area of introspection to expose the nature of linkages that are already established among such countries. Because statistically only a high correlation does not mean a true significant long-term relationship. Hence the comovement of the stock exchanges has to be seen with reference to similar periods when all these countries were not so affected by the pandemic and lockdowns. Besides the present study also addresses the comovements of three countries, namely, Hong Kong, South Korea and New Zealand, which were mostly unaffected during the pandemic period. This will help us to establish our hypothesis that the COVID is instrumental in causing a great damage to the stock markets. A very well-known Johansen cointegration test is applied to interpret the findings empirically.

The objective of this study is to investigate any correlation existing among India's leading stock market index, Nifty with that of the four other countries, USA, Brazil, Russia and UK in the long-term. The study also examines whether these stock markets have moved in the same direction when there was no COVID effect, taking the corresponding period of the previous year and a three-month period in the so-called new-normal period.

2. Literature review

There have been many studies across the world on this subject, but in a normal time period earlier. A few such studies are being referred here for getting a clue to the techniques used and the nature of the conclusion arrived at. Granger and Weiss (1983) find co-integration as a sophisticated econometric tool that handles the problem of non-stationarity without sacrificing any long-term information. Chan *et al.* (1997) investigate the efficiency of the black exchange markets in Indonesia, Malaysia, the Philippines, South Korea, Taiwan and Thailand. Johansen cointegration tests are performed for these black exchange markets together with Japan and Singapore. According to them, black exchange markets are not collectively efficient. Parker and Rapp (1998) observe that various stock market indices are interrelated due to the similar fundamentals which determine the movement in the respective markets. Applying the efficient market hypothesis, they opine that an investor should not be able to predict the movement of one index based on the past movement of another index. They further state if the stock markets are efficient, then no long-term comovement should exist among stock market indices. Kumar (1999) investigates the trends in some selected Asian stock markets, namely, Hongkong, Singapore, Japan and Philippines, and observe whether these can be used to predict stock price trends in India. This study examines the Indian Stock market's efficiency in the cointegration framework. The results indicate that Indian stock markets are efficient in week form. Thiam (2003) examines the linkages among the south-east Asian stock markets following the opening up in the 1990s. The results from the time-varying parameter model also show that the stock market returns of Indonesia, the Philippines and Thailand all become more closely linked with that of Singapore. Parker and Parker (2004) investigate further into the comovement among stock indices of eight Asian countries in order to ascertain empirical evidence of market inefficiency and the transmission of financial market occurrences. Their findings indicate that market problems in one Asian country would quickly migrate to the other countries of the same continent. Mukherjee and Nath (2004) analyse the linkage among the various components of financial markets (foreign exchange, stock and bond markets) of Korea and those of the USA, Japan and six major East Asian countries. He observes first that the interest rates in the major Asian countries, including Korea, are moving independently of one another. He further observes that the correlations between the Korean financial variables are higher after the crisis than these are before and that the highest correlation is seen between the won/dollar exchange rate and the stock price index, signifying that short-term foreign investment flow influences both equally. He also observes an impact of US stock prices on Korean stock prices which increases by more than 20 times since the currency crisis, indicating a synchronization of the Korean stock market and the US stock market. He concludes that the linkage between the stock market prices of Korea and those of Japan and several East Asian countries has been increasing since the currency crisis, whereas the Korean–U.S. stock market linkage has become somewhat less significant. Gunasinghe (2005) examines the integrating behaviour and volatility spill-over transmission across the stock markets of Sri Lanka, India and Pakistan, after liberalization policies initiated in the early 1990s in these countries. Rui and Clara (2008) find that US macroeconomic news and Portuguese earnings news do not affect stock market co-movement, whereas Portuguese macro-economic news lowers stock market comovement. They further observe that US news affects Portuguese stock market returns, although less, when US stock market returns are considered too in the regression. Ai and Wasiuzzaman (2008) find that there is a long-run relationship as there is at the most a single cointegrating vector and the Granger causality test finds that most of the stock markets are influencing other stock markets. Overall, the four stock markets as studied seem to have linkages. Kallberg and Pasquariello (2008) empirically investigate the excess comovement in 82 industry indices in the US stock markets between 5 January 1976 and 31 December 2001. Covariation has been defined as excess comovement between the two assets beyond a level that can be explained by fundamental factors. Johnson and Soenen (2009) opine that the equity markets of six countries, namely, Singapore, Malaysia, Australia, China, New Zealand and Hong Kong are correlated with the equity market of Japan. Sen (2011) investigates the short-run and long-run relationships between the Indian stock market and stock indices of major countries in the Asia–Pacific region. According to the authors, a long-run relationship exists between stock indices of these countries and Sensex. Mohanasundaram and Karthikeyan (2015) observe a high correlation, particularly between the stock markets of India and South Africa. After testing the Granger cause relationship, the existence of a long-run and short-run relationship is tested. The long-run relationships among the stock market indices are analysed following the Johansen and Juselius multivariate cointegration approach. However, the Indian stock market is seen to be a function of its own past lags and the past lags of the South African stock index. Azizi *et al.* (2016) use the stock price index of the Persian Gulf countries available on formal informational databases for 5 years (2005–2010) on a daily basis in order to study the long-term convergence among them. In this study, the relationship between the indices was examined by the correlation analysis method. The stationarity of series related to each country was tested by Augmented Dicky–Fuller (ADF) test and the long-term convergence by the Johansen cointegration method. The results of the Johansson cointegration test in both tested methods of max-Eigen value prove three long-term convergence equations and Trace Static prove six long-term convergence equations as significant. Deo and Prakash (2017) empirically examine the cointegration of the Indian stock market with the major stock exchanges in the world. The results of the Johansen cointegration test confirm the existence of a long-term relationship between India's NSE Nifty and other indices of major stock exchanges in the world. Roy and Sen (2019) observe among India, Japan and USA that not only three indices are highly correlated but they also possess a co-integrating relationship. This establishes the fact that neither there exists any scope of international diversification in the short-run nor in the long-run. However, the Granger causality test results point out the fact that the Nifty granger causes Dow Jones Industrial Average and Nikkei 225 during the study period from 2009 to 2016. Besides, we have come across very few papers recently which examined the impact of COVID-19 across different markets in the world. According to Sharif *et al.* (2020), the geopolitical risk and economic uncertainty of the USA are affected by COVID-19. Gupta *et al.* (2021) examine how different key stock markets, namely, China, Japan, UK, Germany, the USA and India, have been affected by COVID-19.

From the review, the methodology as may be observed in the referred studies is found to be uniform. It makes the decision as regards the choice of suitable statistical techniques easier. The comovement even seen during the normal time in the other studies is not compared to a similar period in earlier years. But, in this study to look into the exclusive effect of the COVID pandemic, the period most affected with it is compared with the period after it and that in the immediate past year had no effect.

3. Methodology

3.1 Study period

The study period is divided into three windows, the most affected period with COVID-2019 for all the five countries with the imposition of lockdowns, from 15 March 2020 to 15 June 2020, the three-month period and similar such period in the previous year, i.e. 15 March 2019 to 15 June 2019 and new-normal three-month period starting from 15 December 2020 (when the vaccination started) to 15 March 2021 (when second wave of COVID started).

3.2 Data source

Data have been collected from the website of *Yahoo finance* on daily closing values of five indices, namely, S&P 500 (USA), MOEX Index (Russia), BOVESPA (Brazil), S&P CNX NIFTY (India) and FTSE 100 (UK) from the five selected affected countries along with the daily closing values of three market indices which were mostly unaffected during the lockdowns period, namely, HIS (Hong Kong), KOSPI 100 (South Korea) and NZ X 50 (New Zealand).

3.3 Hypotheses

Null hypothesis (H0). There is no cointegration among the stock market indices of five COVID affected countries, namely, USA, Russia, Brazil, India and UK.

Alternative hypothesis (H1). There is significant cointegration among the stock market indices of five COVID affected countries, namely, USA, Russia, Brazil, India and UK.

3.4 The econometrics

Since the present study deals with the time series data on different select indices, it is important to check the stationarity of the series which is defined as one with a constant mean, constant variance and constant auto-covariances for each given lag. In order to check the stationarity of the series or presence of unit root in time series data on select indices, ADF test has been applied. In order to choose the best specification of the ADF test, adjusted R^2 has been applied. The Durbin–Watson (*d*) statistic has been estimated here for detecting the presence of an auto-correlation problem.

In order to examine the cointegration among the select indices, Johansen Cointegration Test has been applied. A stationary may be obtained by considering a linear combination of two or more non-stationary series (Engle and Granger, 1987). With the presence of such a stationary linear combination, the non-stationary time series are called as cointegrated series. And this stationary linear combination refers to the cointegrating equation which may be inferred as a long-run equilibrium relationship among the variables (Eviews7 User's Guide II, 2009, p. 685). To examine the cointegration, the time series in its level form should be non-stationary and integrated of order 1, written as $I(1)$. Integrated of order 1 means the time series will be stationary after getting differentiated once. Variables are said to be cointegrated if they are $I(1)$ and have a linear combination that is stationary.

In the literature, we find two methods of cointegration, namely, Johansen's Maximum Likelihood Method and Engle-Granger's Two-Step Estimation Method. In the present study, we have applied the Johansen's method of cointegration as it tests the number of cointegrating relations directly and overcomes some drawbacks of the Engle-Granger Two-Step Estimation Method (Brooks, 2008, p. 354; Skerman and Maggiora, 2009, p. 16).

There are two test statistics for cointegration under the Johansen approach, namely, Maximum Eigenvalue Test (MET) and Trace Test (TT). The TT is a joint test that tests that there is no cointegration [Null hypothesis (H0): $r = 0$] against significant cointegration [Alternative hypothesis (H1): $r > 0$]. The MET which conducts tests on each eigenvalue separately tests the number of cointegrating vectors is equal to r (null hypothesis) against the $r+1$ cointegrating vectors (alternative hypothesis) (Brooks, 2008, p. 351).

The null hypothesis of r cointegrating relations under the trace statistic is computed as:

$$\mathrm{LR}_{\mathrm{trace}}(r) = -T \sum_{i=r+1}^{k} \ln(1 - \lambda_i),$$

where λ_i is the ith largest eigenvalue of the $\prod$ matrix.

This test statistic is computed as (Eviews7 User's Guide II, 2009, p. 690; Skerman and Maggiora, 2009, p. 19):

$$\mathrm{LR}_{\max}(r, r+1) = -T \ln(1 - \lambda_{r+1}).$$

If the calculated value of test statistic is greater than the critical value [obtained from Johansen's tables], the null hypothesis (H0: No cointegration) has to be rejected. Otherwise, the same has to be accepted. Thus, if this null hypothesis (H0: No cointegration) is not rejected, it would be concluded that there are no cointegrating vectors (Brooks, 2008, p. 352).

4. Findings

In our study, ADF test in the form of random walk with a drift and a linear time trend has been applied to check the stationarity of the select five indices at the level and at the first difference before the pandemic, during the pandemic and after it during the new normal period. The ADF test has also been used at the level and at the first difference for three indices that were least affected during the pandemic period. The results of ADF test based on random walk with a drift and a linear time trend are presented in Table 1 to Table 2 and again in Table 3. In this equation, lags have been considered based on Akaike's and Schwarz's Information criteria. It is seen that all the adjusted R square values are statistically significant either at 1% level, 5% level or 10% level. So the selected equation for the ADF test gives us an overall good fit. However, the values of adjusted R square are higher at the first difference of all the select eight time series of indices than that of their levels. The estimated values of the D–W statistic establish that the disturbance terms are free from an auto-correlation problem in all the cases. However, these results are not separately shown here.

From Tables 1–3, it is observed that all the estimated coefficients (ψ) for ADF test and ADF test statistics are insignificant at the level. It implies that the series of all the five indices are non-stationary at the level before the pandemic, during the pandemic and during a new normal period and the series of all the three unaffected indices are non-stationary at the level during the pandemic. However, it is observed that all the estimated coefficients (ψ) for ADF test at their first difference forms are statistically significant at the 1% level. It implies that the null hypothesis of the existence of unit root is rejected in all the cases. From these observed results, it can be concluded that the daily series of the selected five indices and three unaffected indices are stationary at their first difference and each select index is integrated of order one, i.e. $I(I)$.

The upper panel of Tables 4–7 reports the results of trace statistics and the lower panel of these tables reports the results of the maximum eigenvalue statistics. From Table 4, it is observed that the null hypothesis (H0: No cointegration) is not being rejected in trace statistics. Similarly, the null hypothesis (H0) cannot be rejected too in the case of maximum eigenvalue statistics. Thus, it means that there is no cointegration among the select five indices before the pandemic situation. This signifies that the five markets are in general not associated.

The Trace statistic in Table 5 indicates the existence of 1 cointegrating equation at a 5% significance level. This cointegrating equation means that one linear combination exists among the select five indices. The Maximum eigenvalue statistic also shows that there is one cointegrating equation at a 5% level confirming the Trace Test. Therefore, these two tests confirm a cointegrating relationship among the select five indices that force these indices to have a relationship during the pandemic situation.

From Table 6, it is observed that the null hypothesis (H0: No cointegration) cannot be rejected in trace statistics and maximum eigenvalue statistics. Thus, it means that there is no cointegration among the select three indices during the pandemic situation. This signifies that the three markets, namely, Hong Kong, South Korea and New Zealand, which were not affected too much by the pandemic situation are, in general, not associated.

The Trace statistic in Table 7 also indicates that there is also one cointegrating equation at a 5% significance level which means that one linear combination exists among the select five indices. The maximum eigenvalue statistic also shows that there is one cointegrating equation at a 5% level confirming the Trace Test. Therefore, a cointegrating relationship existing among the select five indices in the new normal period is also confirmed.

Table 1. Results of stationarity test on indices series at level and at first difference before pandemic

Index	Country	Stationarity test at level Ψ^{+}	ADF test statistic[#]	Remarks	Stationarity test at first difference Ψ^{+}	ADF test statistic[#]	Remarks
S&P CNX NIFTY	India	−0.139504	−2.001234 (−4.127338)	Non-stationary	−1.011570	−7.370415*** (−4.130526)	Stationary $I(1)$
S&P 500	USA	−0.109998	−1.876251 (−4.127388)	Non-stationary	−1.073820	−7.783755*** (−4.130526)	Stationary $I(1)$
MOEX Russia Index	Russia	−0.143069	−1.703384 (−4.133838)	Non-stationary	−1.136806	−8.018259*** (−4.140858)	Stationary $I(1)$
BOVESPA	Brazil	−0.196723	−2.468499 (−4.127338)	Non-stationary	−1.066164	−7.808091*** (−4.130526)	Stationary $I(1)$
FTSE 100	UK	−0.135310	−2.069141 (−4.127338)	Non-stationary	−1.048377	−7.721602*** (−4.130526)	Stationary $I(1)$

Note(s): $+\psi$ is estimated by fitting the equation in the form: $\Delta y_t = \mu + \psi\, y_{t-1} + \Sigma\alpha_j\, \Delta y_{t-j} + \lambda t + u_t$

[#] Terms within parentheses denote MacKinnon critical value for rejection of the hypothesis of ADF Test at 1% level, ***implies significant at 1% Level

Table 2. Results of stationarity test on indices series at level and at first difference during pandemic

Index	Country	Stationarity test at level			Stationarity test at first difference		
		Ψ^{+}	ADF test statistic#	Remarks	Ψ^{+}	ADF test statistic#	Remarks
S&P CNX NIFTY	India	−0.329827	−2.935696 (−4.130526)	Non-stationary	−1.057280	−8.023132*** (−4.130526)	Stationary $I(1)$
S&P 500	USA	−0.383205	−3.785279 (−4.127338)	Non-stationary	−1.216668	−9.348614*** (−4.130526)	Stationary $I(1)$
MOEX Russia Index	Russia	−0.295123	−3.204326 (−4.127338)	Non-stationary	−1.170775	−9.179412*** (−4.130526)	Stationary $I(1)$
BOVESPA	Brazil	−0.283152	−3.159533 (−4.127338)	Non-stationary	−1.157112	−6.288632*** (−4.133838)	Stationary $I(1)$
FTSE 100	UK	−0.460370	−3.883073 (−4.127338)	Non-stationary	−1.420497	−7.170100*** (−4.133838)	Stationary $I(1)$
HIS	Hong Kong	−0.304864	−3.145429 (−4.124265)	Non-stationary	−1.213852	−9.004695*** (−4.127338)	Stationary $I(1)$
KOSPI 100	South Korea	−0.347891	−3.468109 (−4.124265)	Non-stationary	−1.259305	−9.898891*** (−4.127338)	Stationary $I(1)$
NZ X 50	New Zealand	−0.234586	−2.656095 (−4.124265)	Non-stationary	−0.980365	−8.185672*** (−4.127338)	Stationary $I(1)$

Note(s): Same as Table 1

Table 3. Results of stationarity test on indices series at level and at first difference during new normal

Index	Country	Stationarity test at level Ψ^{+}	ADF test statistic[#]	Remarks	Stationarity test at first difference Ψ^{+}	ADF test statistic[#]	Remarks
S&P CNX NIFTY	India	−0.245477	−2.507222 (−4.161144)	Non-stationary	−0.939353	−6.213219*** (−4.165756)	Stationary I(1)
S&P 500	USA	−0.3429720	−3.048039 (−4.161144)	Non-stationary	−1.165445	−7.752929*** (−4.165756)	Stationary I(1)
MOEX Russia Index	Russia	−0.180253	−2.063058 (−4.161144)	Non-stationary	−1.135714	−7.335421*** (−4.165756)	Stationary I(1)
BOVESPA	Brazil	−0.280909	−2.951078 (−4.161144)	Non-stationary	−1.367798	−9.734755*** (−4.165756)	Stationary I(1)
FTSE 100	UK	−0.168544	−1.925352 (−4.161144)	Non-stationary	−0.985177	−6.575524*** (−4.165756)	Stationary I(1)

Note(s): Same as Table 1

Number of cointegrating relations	Eigen value of the ∏ matrix	Value of trace statistic	Critical value at 5% level	*p*-values
Unrestricted cointegration rank test (trace)				
None	0.354441	56.91550	69.81889	0.3421
1 at most	0.231685	33.72066	47.85613	0.5172
2 at most	0.208179	19.75221	29.79707	0.4397
3 at most	0.126170	7.380979	15.49471	0.5338
4 at most	0.004385	0.232908	3.841466	0.6294
Unrestricted cointegration rank test (maximum eigenvalue)				
None	0.354441	23.19483	33.87687	0.5156
1 at most	0.231685	13.96845	27.58434	0.8248
2 at most	0.208179	12.37123	21.13162	0.5115
3 at most	0.126170	7.148071	14.26460	0.4718
4 at most	0.004385	0.232908	3.841466	0.6294

Table 4.
Results of Johansen co-integration test before pandemic

Number of cointegrating relations	Eigenvalue of the ∏ matrix	Value of trace statistic	Critical value at 5% level	*p*-values
Unrestricted cointegration rank test (trace)				
None	0.456957	75.93920	69.81889	0.0149
1 at most	0.292089	41.74742	47.85613	0.1659
2 at most	0.207992	22.40298	29.79707	0.2766
3 at most	0.142205	9.344665	15.49471	0.3345
4 at most	0.013388	0.754794	3.841466	0.3850
Unrestricted cointegration rank test (maximum eigenvalue)				
None	0.456957	34.19179	33.87687	0.0459
At most 1	0.292089	19.34444	27.58434	0.3884
At most 2	0.207992	13.05831	21.13162	0.4469
At most 3	0.142205	8.589871	14.26460	0.3219
At most 4	0.013388	0.754794	3.841466	0.3850

Table 5.
Results of Johansen co-integration test during pandemic

Number of cointegrating relations	Eigenvalue of the ∏ matrix	Value of trace statistic	Critical value at 5% level	*p*-values
Unrestricted cointegration rank test (trace)				
None	0.267395	27.48790	29.79707	0.1102
1 at most	0.155324	10.75244	15.49471	0.2272
2 at most	0.019641	1.130697	3.841466	0.2876
Unrestricted cointegration rank test (maximum eigenvalue)				
None	0.267395	17.73546	21.13162	0.1401
At most 1	0.155324	9.621743	14.26460	0.2380
At most 2	0.019641	1.130697	3.841466	0.2876

Table 6.
Results of Johansen co-integration test during pandemic for least COVID-affected countries

Number of cointegrating relations	Eigenvalue of the ∏ matrix	Value of trace statistic	Critical value at 5% level	*p*-values
Unrestricted cointegration rank test (trace)				
None	0.529636	70.25447	69.81889	0.0461
1 at most	0.406543	34.80479	47.85613	0.4584
2 at most	0.130391	10.28067	29.79707	0.9759
3 at most	0.060787	3.714198	15.49471	0.9252
4 at most	0.016181	0.766705	3.841466	0.3812
Unrestricted cointegration rank test (maximum eigenvalue)				
None	0.529636	35.44968	33.87687	0.0322
1 at most	0.406543	24.52412	27.58434	0.1174
2 at most	0.130391	6.566468	21.13162	0.9689
3 at most	0.060787	2.947493	14.26460	0.9502
4 at most	0.016181	0.766705	3.841466	0.3812

Table 7. Results of Johansen co-integration test during new normal

5. Conclusion

Stock markets all over the world are expected to be interlinked and sensitive if the countries belong to the same economic or political zone or economic status. Change in the leading stock exchange of any such country may affect the stock exchanges of other interlinked countries. However, the least three COVID-affected countries do not show any integration during the pandemic time. Interestingly, the five top countries in terms of a number of infected individuals neither fall in the same economic or political zone nor in the same economic status as already stated. Hence COVID is the sole cause behind their poor condition of the economy in the aftermath of the infection reaching its peak in these countries and therefrom indicate to fall down. The stock market indices of these countries did not show cointegration during the normal time in the previous year before its first outburst. The effect during the pandemic period is so distinct that it even continued during the new normal period. The developing and developed nations thus stood at an indifferentiable stage of economic crisis as well reflected in their stock markets. The present study would be relevant to the policymakers for different countries affected by the pandemic in order to frame strategies for reviving their stock markets. India could already come out from the stock market crisis based on a huge increase of investment in the stock market by its domestic investors. This is perceived to be a combined effect of uninteresting earning options in the deposit markets where the interest rates are continuously falling coupled with the increase of unspent income siphoned to stock market investment. The present study may be extended to consider the other economic or political zones which were largely being affected by the different waves of COVID 19 which is left for future research.

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