

Analysis of socioeconomic resources, infected and death cases of BRICS Nations and its effect on the Stock market Indices: Post Covid-19

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Abstract:

The novel coronavirus is respiratory infections affected as cold and fever. The World Health Organization denoted as “coronavirus disease 2019” (COVID-19). China was the first country invented in December 2019. This disease affects the health of humans but also influencing financial markets harshly affected across the globe. In April 2020, the International Monetary Fund (IMF) projected the severity of Covid-19 crossways the world affected by 3% this was higher than the 2008-09 financial crises. The Middle East and Central Asia region expressed that the growth of an economy decreased from 1.2% to 2.8% during 2019-20. In the same way, the oil import and export countries were affected by 4.2% and 0.7% correspondingly (IMF, 2020).

The stock market is one of the barometers exposed to the economic status of the country. Due to Covid-19, the economic and social impact on BRICS countries were rigorously affected the manufacturing, services, education, health, hotels, real estate, hospitality tours and travel, media, IT, retails, and banking sector (M. Chaudhary, P.R. Sodani, S. Das, 2020).

Last year, the worldwide stock markets crashed due to the Covid-19 pandemic situation. This study mainly focuses on investigating the impact of socioeconomic resources during COVID-19 on BRICS Nations; to analyze the performance of stock indices and its relation with the Covid-19 infected and death cases of BRICS nations. This study is empirical from official stock exchanges of respective countries in the pandemic situation on the stock market from January 2020-August 2021. The Covid-19 number of cases and their deaths are from the official website of the World Health Organization, Dashboard. Finally, to find out the relationship between the numbers of infected and deaths influencing the stock markets in BRICS Nations. This study finds the present situation based on that will further decisions for diversification of funds for getting benefits in the future especially post BRICS formation.

Keywords: BRICS, Stock market, Covid-19, Nations, Volatility

Introduction:

BRICS is a bloc that consists of five countries viz., Brazil, Russia, India, China, and South Africa. Initially, in 2006, BRICS was started with four nations. Later, South Africa joined in BRICS. These countries are Brazil, Russia, India, China, and South Africa (BRICS) nations. Currently, five nations in a bloc of BRICS are contributing one-fourth of the landmass, more than 40% of the global population, and 46% of the labor force in the world. These countries have been protecting 30% of global GDP and 50% of global economic growth. BRICS nations have played a vital role in the world economy in producing goods and services with a potential share of the world trade over the last two decades to the above 15% from 3.6%. And exports are increasing from 417 USD billion to 2339 USD billion during 2001-2016. For international investors, BRICS is the best venue to invest. It was increased from 81 billion USD in 2000 to over 221 billion USD in 2012 (**Rasoulineshadr & Jabalameli, 2018**). These five nations are leading to political powers and emerging economies at the national and international levels. These nations have combined increasing growth rate, economic potential, demographic development, and accelerating income levels. In recent decades BRICS economy position has risen enormously (**Acharya S, Barber S, Lopez-Acuna D 2014**). The group of nations to meet to promote trade and investment, accelerating global investment at the time of financial crisis, and by the end of 2027, they might overtake the G7 economies. According to Goldman Sachs, BRICS will be the rich group by 2050. In addition, the financial market and its investors were also affected due to covid-19. Leading stock markets are severely affected in Covid-19. These are Dow Jones Industrial Average (DJIA), Standard & Poor's 500 Index (**Wagner, 2020**). Many other countries such as Europe, Africa, and Asia have also in the same line the prices of the stocks plunged (**Ashraf, 2020**). Covid-19 impact on BRICS nations also severely affected about 20% of share prices dropped trend since the outbreak of the Covid-19. In particular, BRICS stock exchanges had moved in the same way as the rest of the world stock markets, other times different from world stock markets and sometimes remain stable regardless of the present pandemic Covid-19.

Review of Literature:

In the literature review, the BRICS countries denoted as “an unfinished process of great economic, legal and social interest” (**Scaffardi, 2014**) and a “symbol of the broader emerging markets phenomenon” **Gu et al., (2016); Stuenkel (2015)** emphasizes that BRICS transformation “from an investment term into a household name of international politics” represents “one of the defining developments in international politics of the first decade of the twenty-first century.” Many studies have examined financial integration between developed countries such as Asian stock markets, Asian and developed markets, Latin American Countries, Middle East, and North Africa Bloc. Few studies revealed the ongoing pandemic situation and its impact on global oil price, oil, and natural gas demand (E. Apergis, N. Apergis, (2020); N. Devpura, P.K. Narayan (2020); M. Fu, H. Shen (2020); L.A. Gil-Alana, M. Monge (2020); W. Huang, Y. Zheng (2020); P.K. Narayan (2020). Recent studies have indicated that the effect of covid-19 negatively influenced the global outcome, especially global trade and financial markets (T. Liu, B. Pan, Z. Yin, 2020; B. Njindan Iyke (2020); X. Qin, G. Huang, H. Shen, M. Fu (2020); A.A. Salisu, A.A. Sikiru (2020); H. Shen, M. Fu, H. Pan, Z. Yu, Y. Chen (2020); Y. Wang, D. Zhang, X. Wang, Q. Fu (2020); Z. Yu, Y. Xiao, Y. Li. (2020); P. Yue, A.G. Korkmaz, H. Zhou. (2020); X. Gu, S. Ying, W. Zhang, Y. Tao (2020); B.N. Iyke (2020); C.T. Vidya, K.P. Prabheesh (2020); H. Xiong, Z. Wu, F. Hou, J. Zhang

(2020). Jingmin Zhou, Wenxin Yan, Lin Zhu & Jue Liu (2021) Covid-19 pandemic in BRICS countries and its association was with socioeconomy and demographic characteristics, health vulnerability, resources, and policy response mentioned in the report on Infectious Diseases of Poverty. This study explored daily new Covid-19 cases that were affected by socioeconomy and demographic factors. During the pandemic, the BRICS countries have been trying to reduce inequalities and strengthen the health system. This study used log-linear Generalized Additive Models (GAM) for analyzing related factors. The result of this study India had affected highest number 18.76 million, followed by Brazil 14.45 million, Russia 4.81 million, and South Africa 1.58 million, while China 0.10 million had the lowest figure. In BRICS nation South Africa had the recorded low vaccination doses of 0.18 million end of April 30, 2021. The current study focuses research on socioeconomy issues, pandemic situations influencing BRICS stock markets. It is needed because very few blocks came into existence in the recent past decade like the BRICS bloc. From the perspective of economic uncertainty, **Esposito, Kapoor, Mathur(2016)** present these countries as being “amid severe economic and political woes” All five emerging economies have been significant structural weaknesses, especially two nations (Russia and Brazil) experienced a new episode of recession in 2015-16. Structural drawbacks are not limited to those caused by the “curse of natural resources” by the volatility of crude oil prices and the significant part of commodities but are more complex. Besides, for Russia, the sanctions imposed by the West in response to the annexation of Crimea in 2014 and the Ukrainian crisis are specific factors. Similarly, in Brazil’s case, the Petrobras scandal was broke out in February 2014, the determinant of the Brazilian recession. At the same time, China’s economic growth slows down. Consequently, Goldman Sachs gave up 2015 the BRIC investment fund (which it had launched in 2006), including it in the larger fund of emerging economies.

The problem of the study:

According to the World Health Organization no. of Covid-19 cases was recorded more than 150.99 million and 3.17 million death cases across the world by the end of May 2021 (**WHO, 2021**). The number of SARS-CoV-2 infection cases was recorded at 39.77 million by the end of 30th April 2021 in BRICS countries (**Kontis, 2020**). The numbers of infected and deaths have increased, and it will be influenced negatively towards the stock market. This study focuses on socioeconomic resources and Covid-19 infected and death cases, and to know how it will be affecting the stock market will be analyzed. Most of the researchers have studies stock market performance before Covid-19. Few studies highlight Covid-19 increases significantly the financial market is affected by negative indices and its stock returns (A.M. Al-Awadhi, K. Al-Saifi, A. AlAwadhi, S. Alhamadi,2020; M. Ali, N. Alam, S.A.R. Rizvi(2020); M.F. Bashir, M.A. Benjiang, L. Shahzad (2020); R.J. Barro, J.F. Ursúa, J. Weng, (2020); G. Katechos (2020); A.K. Mishra, B.N. Rath, A.K. Dash (2020); D.H.B. Phan, P.K Narayan (2020). But no research has been done on the comparative analysis on the impact of Covid-19 towards BRICS stock markets, and these nations' growth rate, economic potential, and demographic development combined during Covid-19 for improving their income levels and further global sustainable development. This study will also be helpful in the future for any unforeseen and natural calamities affected by the stock market and financial markets, and its investors will make a plan for reducing their risk for the future.

Aim of the Study:

The paper aims to investigate the impact of socioeconomic and hospital resources due to the effect of Covid-19 and analyze the performance of individual countries and its stock indices of BRICS Nations in post-Covid-19.

- To investigate the impact of socioeconomic and hospital resources due to the effect of Covid-19 on BRICS Nations
- To analyze the performance of stock indices of BRICS nations in Post-Covid-19

Hypothesis development

The following two hypotheses are verified to find out the relationship among the BRICS Nations.

- H01: There is no relationship among the BRICS Nations in stock market returns
- H02: There is no relationship among the BRICS Nations in the number of cases and deaths to stock market returns in the Covid-19.

Methodology of the study:

This study employs monthly prices of major BRICS Indices, choosing one index from each country from January 2020 to August 2021. The month-end stock return has been considering as in the same way the month-end the particular number of cases and deaths recorded due to Covid-19. Each nation's significant indices return took as the dependent variable, and the number of cases and deaths reported month-end day as the independent variable. Monthly data is vital than daily and weekly because it avoids noise related to daily weekly observations. This study is purely empirical from official stock exchanges of respective countries. The index value data is from investing.com, its open-source website providing the data of all the major stock markets worldwide. Choice of data available on the websites is investing.com, moneycontrol.com, and respective official stock market websites. The data from the following indices: Brazil-Bovespa, Russia-MOEX, India-Sense, China-Shanghai-South Africa-FTSE/JSE. These countries are the most influencing countries' representative indices of the stock markets to assess the impact of the COVID-19 outbreak. Mainly this study focuses on the Covid-19 pandemic situation on the stock market from January 2020-August 2021. The Covid-19 number of cases and their deaths are from the official website of the World Health Organization, Dashboard. This study will focus on investment in the pandemic situation by the investors among BRICS stock markets and examine the current position in BRICS nations during Covid-19. The framework of this study is in four parts. Firstly, observe socioeconomic and demographic factors in BRICS Nations. Second, test for the number of infected, death, and vaccine administered by the BRICS Nations till-date. The third test for Stock market return in BRICS nations during January 2020- August 2021. Finally, to find out the relationship between the number of infected cases and deaths influencing the stock markets in BRICS Nations.

Data Analysis:

In BRICS Nations' every country has its characteristics in terms of socioeconomic, health performance, and policy response to the Covid-19. China and India are the largest populations, and these nations have more mobility facing significant challenges in the prevention and control of the Covid-19. Brazil

and South Africa are facing the non-availability of vaccination coverage in their country population. Russia is facing political issues for providing vaccination to other countries. In this way, the BRICS nations are facing many challenges to overcome the pandemic situation of Covid-19 (Li Z, Chen Q, Feng L, Rodewald L, Xia Y, Yu H, 2020; Broadbent A, Combrink H, Smart B. 2020; King EJ, Dudina, 2021; Lancet T. India, 2020; Acharya S, Barber S, Lopez-Acuna D, Menabde N, Migliorini L, Molina J, 2014; Mckee M, Marten R, Balabanova D, Watt N, Huang Y, Finch AP, 2014). Oscar J Mújica, Enrique Vázquez, Elisabeth C Duarte, Juan J Cortez-Escalante, Joaquin Molina & Jarbas Barbosa da Silva Junior, (2014) explored socioeconomy inequalities and mortality trend in BRICS, 1990-2010 the presence of socioeconomy and health inequalities has been influencing between the countries. However, the substantial reductions observed within Brazil and China in the inequalities related to levels of infant mortality is encouraging. In the recent past, these national economies are falling in their primary exports due to drastic changes in global demand (D.Salvatore, 2020). The pandemic spreads in many cases is increasing day by day, and its adverse effects on BRICS nations and the global economy (A.H. Samadi, S. Owjimehr, S.N.Halafi, 2020).

Table: 01 Comparison of Socioeconomic and demographic factors

Characteristics	BRICS countries				
	Brazil	Russia	India	China	South Africa
Total population (million)	212.56	145.93	1380.00	1439.32	59.31
Life expectancy at birth (years)	75.88	72.58	69.66	76.91	64.13
Population density (people per km)	25.04	8.82	450.42	147.67	46.75
Extreme poverty	3.40	0.10	21.20	0.70	18.90
GDP per capita (current \$)	14103.45	24765.95	6426.67	15308.71	12294.88
Health Vulnerability					
Diabetes prevalence (%)	8.11	6.18	10.39	9.74	5.52
Cardiovascular death rate (%)	177.96	431.30	282.28	261.90	200.38
Population aged 60 and above (%)	14.05	22.41	10.12	17.35	8.54

(Sources from World Health Organization, 2021)

From the above analysis of the comparison of socioeconomic and demographic factors, the total population of Brazil is 212.56 million, 145.93 million in Russia, 1380 million in India, 1439.32 million in China, and South Africa total population is 59.31 million. The life expectancy at birth years, India is 69.66 years, Brazil is 75.88 years, and Russia life expectancy is 72.58 years, 76.91 years in China and 64.13 years in South Africa, comparatively low life expectancy among other nations due to unavailability of health facilities. The population density, India is higher than in other BRICS nations. It is 450.42 people per kilometre. Other nations were 25.04 km in Brazil, 8.82 km in Russia, 147.67 km in China, and 46.75 km in South Africa. Concerning extreme

poverty, India has occupied a significant position of 21.00%, 3.40 in Brazil, 0.10 in Russia, 0.70 in China, and 18.90 in South Africa. Gross Domestic Product per capita in USD \$ India is the low performance with USD 6,426.67, whereas other nations are 14,103.45 by Brazil, 24,765.95 by Russia, 15,308.71 by China, and 12,294.88 by South Africa. Regarding health vulnerability highest diabetes in India is 10.39% of the global population. Other nations are including 8.11% in Brazil, 6.18% in Russia, 9.74% in China, and 5.52% in South Africa. Regarding the Cardiovascular death rate, Russia occupied first place comparatively other nations 431.30%, whereas other nations in BRICS 177.96% in Brazil, 282.28% in India, 261.90% in China, and 200.38% in South Africa. Finally, the population of more than 60 years old having a high percentage by Russia with 22.41%, and other nations in BRICS is 14.05% in Brazil, 10.12% in India, 17.35% in China with the second position, and 8.54% in South Africa.

Table: 02 the number of infected, deaths and Covid-19 vaccine administered by the BRICS Nations end of August 2021

BRICS Nations	No. of cases	% in Total	Deaths	% in Total	Vaccine administered (millions)	% in Total
Brazil	20,728,605	9.58	579,010	12.87	187.6	3.57
Russia	6,901,152	3.19	182,325	4.05	78.4	1.5
India	32,737,939	15.13	438,210	9.74	477.8	9.10
China	122,995	5.69	5,682	0.13	1544.2	36.33
South Africa	2,764,931	1.27	81,595	1.81	9.9	0.19
Total Cases	216,303,376	100	4,498,451	100	5250	100

Sources from World Health Organization

The analysis mentioned the number of infected cases, deaths, and the Covid-19 vaccine administered by the BRICS Nations end of August 2021. The infected Covid-19 reported to WHO was 9.58% in Brazil, 3.19% in Russia, 15.13% highest recorded in India, 5.69% in China, and 1.27% in South Africa. The number of deaths reported in Brazil was higher with 12.87% in BRICS Nations whereas other nations 4.05% in Russia, 9.74% in India, 0.13% in China, and 1.81% in South Africa. The Total vaccine administered was 5,250 million in the globe. Among the nations in BRICS, Brazil was 3.57%, 1.5% in Russia,

9.10% in India, 36.33% in China with the highest vaccine administered to their population, and 0.19% in South Africa. This paper investigates the development of collaboration with BRICS and its implication for Africa. The main Agenda of the BRICS nations are 17 sustainable goals with the funded projects of USD50 million by the New Development Bank. Build project focuses on finance, technology, capacity building, trade, and systematic issues (Naik 2017). In BRICS nations' the total population was contributing 40% and 25% of the worlds' territory (Sharma and Varshney 2020).

Table: 3 BRICS COUNTRIES INVENTED VACCINES AND ITS PROGRESS

SL. NO.	NAME OF THE COUNTRY	NAME OF THE VACCINE	COMPANY NAME
01	CHINA	AR CoV Phase-I June/2020	Academy of Military Medical Sciences, Suzhou Abogen Biosciences and Walvax Biotechnology
		Ad5 Phase III in August 2020	CanSino Biologics and Institute of Biology at the country's Academy of Military Medical Sciences
		ZF2001 (Phase II in July 2020 with Phase III starting December 2020)	Anhui Zhifei Longcom and the Chinese Academy of Medical Sciences
		RBD (Phase III on 6 November 2020)	West China Hospital of Sichuan University
		2 inactivated COVID-19 vaccines (Phase III started 14 September 2020)	Sinopharm in partnership with Wuhan Institute of Biological Products
		CoronaVac (Phase III in July 2020)	Sinovac Biotech
		Inactivated COVID-19 vaccines (Phase II started June 2020)	Institute of Medical Biology at the Chinese Academy of Medical Sciences
		Inactivated COVID-19 vaccines (Phase I started October 2020)	Shenzhen Kangtai Biological Products ^a

02	INDIA	ZyCov-D (Phase II initiated 6 August 2020 with Phase III starting December 2020)	Zydus Cadila
		Covaxin (Phase III in October 2020)	Indian Council of Medical Research, the National Institute of Virology, and Bharat Biotech
		Covishield (Phase III completion in December 2020)	Serum Institute of India in partnership with AstraZeneca and Oxford University
03	RUSSIA	Gam-Covid-Vac (renamed Sputnik V) and in Phase III started October 2020	Gamaleya Research Institute, part of Russia's Ministry of Health
		EpiVacCorona (Phase I/II in August 2020)	Vector Institute
		PittCoVacc (December 2020 Phase I/II)	University of Pittsburgh
		Inactivated COVID-19 vaccines (Phase I started October 2020)	Chumakov Center at the Russian Academy of Sciences
04	BRAZIL	--	--
05	SOUTH AFRICA	--	--

Source: Author, Data from Zimmer, Corum, and Wee (2020, online), Tregoning et al. (2020, 168), and Sheriff and Sinha (2020, online).

The following analysis refers to the stock market indices of five nations beginning of Covid-19 and Post Covid-19 view. Analysis indicates changes in stock market indices due to the Covid-19 pandemic situation from January 2020-December 2020. Due to the number of infected cases and deaths were recorded during this period. A significant change has taken place with a -26.54% decreased in India between January and March 2020. Other nations were also the same fluctuation in the respective stock market except for China. Other nations in BRICS were -21.05% decreased in Brazil, -21.96% in Russia, -26.54% in India, -6.86% in China with low fluctuation, and -25.60% in South Africa. By the end of December 2020, the comparison with January 2020 indices was 4.62% in BOVESPA-Brazil, 6.90% in MOEX-Russia, 17.26% in India-Sensex, 16.68% in Shanghai-China, and 0.99% in FTSE/JSE South Africa.

Table: 4 The Comparison of Post COVID View of BRICS Stock Market Indices

Bourses	Indexes Jan 2020 The First case identified	Indexes March 2020 WHO declared as a pandemic	Indexes December 2020
Brazil – Bovespa	113760.60	73,428.78 (-21.05%)	119017.20 (4.62%)
Russia – MOEX	3076.65	2,401.11 (-21.96%)	3289.02 (6.90%)
India – Sensex	40723.49	29,915.96 (-26.54%)	47751.33 (17.26%)
China – Shanghai	2976.53	2,772.20 (-6.86%)	3473.07 (16.68%)
South Africa- FTSE/JSE	3371.25	2,508.29 (-25.60%)	3404.63 (0.99%)

**Table-5 Stock Market Monthly Returns of BRICS Nations (in %)
During January–December 2020**

Month & Year	Brazil	Russia	India	China	South Africa
Jan-20	0.12	12.3	-0.5	0.28	13.19
Feb-20	-2.6	1.64	-0.4	0.11	16.54
Mar-20	1.65	-6.12	-4.6	-0.9	37.39
Apr-20	-3.2	-3.27	1.89	0.44	23.75
May-20	2.9	1.92	1.88	0.22	20.95
Jun-20	2.03	2.25	-0.6	-0.6	21.94
Jul-20	-0.6	6.26	-0.3	-0.2	16.14
Aug-20	-2.7	6.62	-2.1	-0.2	11.92
Sep-20	-1.2	4.1	0.25	-0.1	16.79
Oct-20	-4.3	-1.8	-0.4	0.1	16.27
Nov-20	0.32	16.2	-0.3	1.14	23.27

Dec-20	0.24	20	0.28	1.72	17.48
Jan-21	-3.2	23.8	-1.3	-1.9	15.24
Feb-21	-2	24.6	-3.8	-2.1	16.9
Mar-21	1.24	28.7	-1.3	0.5	19.56
Apr-21	-0.8	29.3	-2	0.42	13.53
May-21	0.96	39	1	0.41	14.31
Jun-21	0.14	41	-0.1	-0.9	14.95
Jul-21	-1.1	37.7	-0.1	1.49	13.54
Aug-21	0.76	42.8	0.41	0.45	14.42

	Column 1	Column 2	Column 3	Column 4	Column 5
Column 1	1				
Column 2	0.172874	1			
Column 3	0.087666	0.062231	1		
Column 4	0.199908	0.114805	0.538112	1	
Column 5	0.354725	-0.51551	-0.29021	-0.11135	1

The above table represents the information returns on the stock market, the number of infected cases, and deaths in respective BRICS nations during January 2020-August 2021. It shows the average return of BOVESPA-Brazil was -0.56, and other was 16.36 in MOEX-Russia, -0.60 in India, 0.01 return in Shanghai-China, 17.90 indices return in South Africa-FTSE/JSE. The minimum and maximum indices returns are -4.25 and 2.90 BOVESPA-Brazil, -6.12 and 42.82 MOEX-Russia indices, -4.61 and 1.89 India senses, -2.12 and 1.72 Shanghai-China, and 11.92 and 37.39 in South Africa-FTSE/JSE indices. The standard deviation of stock market indices in BRICS Nations is 1.96 in BOVESPA, 16.13 in MOEX indices, 1.62 in Indian Sensex, 0.97 in Shanghai indices, and 5.70 in FTSE/JSE indices of South Africa. It indicated that the stock market risk is low in China for twenty months post-Covid-19. The mean value of infected cases in Brazil was 242657, 82890.15 in Russia, 363591.20 in India, 1296.50 in China, and 33866.70 in South Africa. It reveals high mean infected Covid-19 cases recorded in India and low average cases recorded in China. The minimum and maximum Covid-19 infected cases are 0.00 and 505668, 2.00 and 191454.00, 2.00 and 2597285, 45 and 23231, 0.00 and 132450.00 in Brazil, Russia, India, China, and South Africa. The number of cases increasing/decreasing reported as infected cases 153103.78 in Brazil, 60748.91 in Russia, 579405.33 in India, 2771.50 in China, and 38147.56 in South Africa. The standard deviation in the Covid-19 infected cases in China was low. Finally, the death cases recorded in respected nations mean is 6864.85 in Brazil, 2219.25 in Russia, 4777.05 in India, 51.35 in China, 975.65 in South Africa. Brazil is the highest death cases recorded, and China is the low average

reported. The minimum and maximum deaths reported in BRICS Nations, Brazil is 0.00 and 21094, 0.00 and 5593.00 in Russia, 0.00 and 23231.00 in India, 0.00 and 427 in China, and 0.00 and 3357 in South Africa. The minimum and maximum death cases India occupied the highest position whereas China is the least. The fluctuation in death cases was 5399.77 in Brazil, 1741.37 in Russia, 6332.44 in India, 113.44 in China, and 1024.53 in South Africa. From the risk point of view, India is a higher risk, whereas China with lower risk.

The analysis indicates that there is no relationship between the stock market returns in BRICS Nations. The values are less than significant values between the stock markets. Irrespective of infected cases recorded and death cases identified no relationship between the stock market returns in BRICS nations. The relationship between the stock market returns in BRICS Nations. The values are less than significant values between the stock markets. Irrespective of infected cases recorded and death cases identified no relationship between the stock market returns in BRICS nations.

Table-5 Stock Market Monthly Returns of BRICS Nations (in %) During January–December 2020

Month & Year	Brazil SM-Return	Cases	Deaths	Russia	Cases	Deaths	India	Cases	Deaths	China	Cases	Deaths	South Africa-B	Cases	Deaths
Jan 2020	0.12	0	0	12.28	2	0	-0.47	2	0	0.28	12426	305	13.19	0	0
Feb 2020	-2.59	6	0	1.64	5	0	-0.36	32	0	0.11	2926	427	16.54	0	0
Mar 2020	1.65	5639	267	-6.12	3197	35	-4.6	2395	52	-0.9	589	32	37.39	398	8

							1			0					
Apr 2020	- 3.2 0	38594	2659	- 3.27	53738	533	1.8 9	13484	477	0.4 4	55	1	23.7 5	1975	37
May 2020	2.9 0	18060 5	6830	1.92	61362	115 2	1.8 8	50275	1297	0.2 2	45	0	20.9 5	9624	236
June 2020	2.0 3	26410 7	7213	2.25	46814	108 8	- 0.6 0	144306	2841	- 0.6 1	116	0	21.9 4	56177	613
July 2020	- 0.5 6	31911 9	7237	6.26	38385	859	- 0.3 4	365201	5301	- 0.2 3	1463	15	16.1 4	69090	149 8
August 2020	- 2.7 2	28802 9	6017	6.62	35179	727	- 2.1 3	571078	7128	- 0.2 4	166	7	11.9 2	14333	798
Sep 2020	- 1.1 5	19091 0	4851	4.10	63563	103 4	0.2 5	556841	7279	- 0.0 6	155	0	16.7 9	10218	562
Oct 2020	- 4.2 5	11452 3	3006	- 1.80	12290 4	218 5	- 0.4 3	319271	3577	0.1 0	247	0	16.2 7	11206	332
Nov 2020	0.3 2	29561 8	3990	16.2 3	19145 4	361 4	- 0.2 5	251303	3486	1.1 4	831	3	23.2 7	25310	628
Dec 2020	0.2 4	25201 8	4923	20.0 4	18653 9	372 8	0.2 8	136115	1813	1.7 2	570	14	17.4 8	93978	265 4
Jan 2021	- 3.2	36459 3	7368	23.8 2	13103 9	372 0	- 1.2	91650	935	- 1.9	946	25	15.2 4	44397	335 7

	1						6			1					
Feb 2021	- 1.9 8	37395 4	9935	24.6 0	81353	282 9	- 3.8 0	105080	749	- 2.1 2	209	1	16.9 0	9858	100 1
Marc h 2021	1.2 4	50566 8	2109 4	28.7 4	61062	263 4	- 1.2 5	513885	3071	0.5 0	187	0	19.5 6	7035	306
April 2021	- 0.8 2	42193 3	1736 5	29.3 4	60686	263 0	- 1.9 8	259728 5	2323 1	0.4 2	185	2	13.5 3	8472	281
May 2021	0.9 6	44947 8	1179 7	38.9 6	62995	262 5	1.0 0	914539	2078 7	0.4 1	3341	12 5	14.3 1	26498	566
June 2021	0.1 4	36470 9	1081 0	41.0 4	15965 0	392 1	- 0.1 3	312250	6254	- 0.9 2	591	64	14.9 5	13245 0	172 9
July 2021	- 1.1 0	24783 0	7120	37.6 5	16213 6	547 8	- 0.1 2	283923	3800	1.4 9	602	1	13.5 4	79349	252 5
Aug 2021	0.7 6	17580 7	4815	42.8 2	13574 0	559 3	0.4 1	42909	3463	0.4 5	280	5	14.4 2	76966	238 2

(Source: Official website of Stock Exchanges and Dashboard of World Health Organization)

Descriptive Statistics of BRICS Nations on stock market return, Covid-19 infected cases and deaths from January 2020 to August 2021

Mean	- 0.56	24265 7.00	6864. 85	16. 36	82890. 15	2219 .25	- 0.60	363591. 20	4777. 05	0. 01	1296. 50	51.3 5	17. 90	33866. 70	975. 65
Median	- 0.22	25806 2.50	6423. 50	14. 26	62178. 50	2405 .00	- 0.35	197804. 50	3267. 00	0. 17	425.0 0	4.00	16. 41	12769. 50	589. 50
Standard Dev	1. 95	15310 3.78	5399. 77	16. 13	60748. 91	1741 .37	1. 62	579405. 33	6332. 44	0. 97	2771. 50	113. 44	5.7 0	38147. 56	1024 .53
Min	- 4.25	0.00	0.00	- 6.12	2.00	0.00	- 4.61	2.00	0.00	- 2.12	45.00	0.00	11. 92	0.00	0.00
Max.	2. 90	50566 8.00	21094 .00	42. 82	19145 4.00	5593 .00	1. 89	259728 5.00	23231 .00	1. 72	12426 .00	427. 00	37. 39	13245 0.00	3357 .00

Regression Analysis

This study is used regression analysis as a statistical tool to find out the relationship between stock market indices (dependent variable) and the Covid-19 infected, number of deaths (independent variable). Five nation stock market indices, infected, and death cases took from World Health Organization-dashboard figures were considered. Regression analysis is the technique to predict dependent (Y) based on independent variables X1, X2, X3....XK ---- Y.

The X1, X2, X3 as predictor/independent variables. Y is the dependent variable or outcome variable. The summary outputs of the five nations are:

Brazil

SUMMARY

OUTPUT

Regression Statistics

	0.24022020
Multiple R	3
	0.05770574
R Square	6
	-
Adjusted R Square	0.05315240
	1
Standard Error	2.00245795
	5
Observations	20

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	4.17453638	2.08726819	0.52053680	0.60337264
Residual	17	68.1672436	4.00983786		
Total	19	72.34178			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
	-		-		-		-	
Intercept	0.93146388	0.86472187	1.07718320	0.29644749	2.75586756	0.89293979	2.75586756	0.89293979
	2	4	7	6	3	9	3	9
	-2.54848E-		0.39448305	0.69812940	-1.61785E-		-1.61785E-	
X Variable 1	06	6.4603E-06	3	8	05	1.10816E-05	05	1.10816E-05
	0.00014404	0.00018317	0.78640265	0.44245654	0.00024241	0.00053051	0.00024241	0.00053051
X Variable 2	8	4	1	3	4	1	4	1

Russia

SUMMARY

OUTPUT

<i>Regression Statistics</i>	
	0.89848803
Multiple R	8
	0.80728075
R Square	4
Adjusted R Square	0.78460790
	2
Standard Error	7.48397470
	9
Observation	20

s

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	2	3988.53176	1994.26588	35.6056105	8.3534E-07			
Residual	17	952.167916	56.0098774					
Total	19	4940.69968						

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	2.38867406	2.89907574	0.82394331	0.42138163	-3.72784110	8.50518923	-3.72784110	8.50518923
X Variable 1	0.00018404	5.53562E-05	3.32480058	0.00400950	-0.00030084	-6.7257E-05	-0.00030084	-6.7257E-05
X Variable 2	0.01316801	0.00193114	6.81877987	2.98853E-06	0.00909366	0.01724236	0.00909366	0.01724236

India

SUMMARY

OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.396424356
R Square	0.15715227
Adjusted R	0.057993714

Square	
Standard Error	1.568095334
Observations	20

ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	2	7.7940894	3.8970447	1.584858389	0.233812396			
Residual	17	41.801691	2.458923					
Total	19	49.59578						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.723253843	0.4450021	1.6252818	0.122496228	1.662126241	0.215618555	1.662126241	0.215618555
X Variable 1	-2.45349E-06	1.387E-06	1.7686542	0.094889666	-5.38024E-06	4.73261E-07	-5.38024E-06	4.73261E-07
X Variable 2	0.000212332	0.0001269	1.6728733	0.112652998	-5.54596E-05	0.000480124	-5.54596E-05	0.000480124

China

SUMMARY
OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.0926845
R Square	0.0085904
Adjusted R	-0.108046

Square	
Standard	
Error	1.0216693
Observations	20

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance</i>			
					<i>F</i>			
Regression	2	0.153755596	0.076877798	0.073651268	0.9292904			
Residual	17	17.7447394	1.0438082					
Total	19	17.898495						

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-0.0156253	0.256555956	0.060904038	0.952145923	-0.556911	0.525660459	0.556911047	0.525660459
X Variable 1	4.395E-05	0.000120117	0.365870944	0.718974459	-0.0002095	0.000297373	0.000209478	0.000297373
X Variable 2	-0.0005229	0.002934664	0.178191195	0.860678994	-0.0067145	0.005668669	0.006714532	0.005668669

South Africa

SUMMARY

OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.35942789
R Square	0.12918841
Adjusted R Square	0.02673999

Square	3
Standard	5.62704954
Error	6
Observation	
s	20

ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance</i>			
					<i>F</i>			
Regression	2	79.8564079	39.9282039	1.26100932	0.30857141			
Residual	17	538.282672	31.6636865					
Total	19	618.13908						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	19.8597703	1.79147956	11.0856806	3.34906E-09	16.0800788	23.6394618	16.0800788	23.6394618
X Variable 1	-5.27979E-07	5.11447E-05	0.01032324	0.99188357	0.00010843	0.00010737	0.00010843	0.00010737
X Variable 2	0.00198625	0.00190434	1.04301437	0.31154785	0.00600406	0.00203155	0.00600406	0.00203155

Five nation's summary

BRICS Nations	R Square- %	ANOVA	Coefficients P-value
Brazil	5.77	0.6033	0.2964

Russia	80.72	8.353	0.4213
India	15.71	0.2338	0.1224
China	8.5	0.9292	0.9521
South Africa	12.91	0.3085	3.3490

The analysis indicated no relationship between stock market indices returns and cases of infected deaths in BRICS. From the above table, the R Square value of the Russian stock market is only 80.72% the remaining nations are less than 15%. The ‘P’ value of ANOVA and Coefficients value is higher than 0.05. Hence, we can say that there is no relationship between the dependent variable of indices with independent variables of Covid-19 infected and death cases.

Future research: This study investigated the use of statistical techniques to show a relationship between the countries and the impact of the stock market on the rest of the four nations. This study is more helpful to investors to take various financial decisions for improving their wealth, strengthening the financial markets in a pandemic situation. Foreign investors are looking for significant benefits so that to diversity their portfolio in emerging markets. BRICS is the right investment portfolio for improving their wealth with low risk.

3. Conclusion

The BRICS Nations and their population are about 45% of the total population of BRICS countries. The health system of BRICS countries is during the Covid-19 pandemic situation, India, Brazil, and Russia were three of the top five countries are facing highest diseases due to the Covid-19 with the United States and France. The number of cases recorded in BRICS countries is more than 26.3% of the global total by the end of April 30, 2021 (Romaniuk P, Poznanska A, Brukalo K, Holecki T, 2020). Comparison of socioeconomic and demographic factors, India and China having the highest population, and the life expectancy at birth, population density per kilometer, extreme poverty, and GDP per capita in India are low compared to other nations. The health factors diabetes prevalence, cardiovascular death rate, and population aged 60 and above India occupied high positions than other nations. For this reason, the no. of Covid-19 cases and deaths has been recording in the second position across the globe. It is observed from the analysis during pandemic situation Jan-March 2020 the minimum fall of stock indices by China-Shanghai later nine months March-December 2020 highest recovered by India-Sensex and China-Shanghai than other nations. During the pandemic, the stock market returns of BRICS nations are downward trends (Batten & Vo, 2010; Daly & Vo, 2013). In the same way, the individual nations infected and death cases are not effects on stock market indices of all the nations.

Limitations and Further study

This study has limited many Covid-19 and death cases influenced to BRICS stock market and to find out the behaviour of the stock market during the pandemic situation. No study covers these aspects of a research problem. This study will provide required information to investors, bankers, regulators to manage the efficient portfolio, and policy-makers focus on regulatory issues relating to the need cross border financial crisis. It is, therefore, to find the present situation based on that will further decision for diversification of funds for getting benefits in the future especially post BRICS formation.

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