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IMPACT OF RUSSIA-UKRAINE WAR ON THE RETURNS OF SENSEX AND NIFTY 50 - A COMPARATIVE ANALYSIS

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ABSTRACT

The economy suffers significantly as a result of war. The potential for inflation and deregulation exacerbates the consequences of wars on money and debt. The goal of the planned study is to look at the impact of Russia's invasion of Ukraine on Indian stock index returns before and during the invasion. Using daily stock market data, many analysts said that wars have a detrimental influence on interactions at the world's key financial markets. In this paper, the researcher intends to find the impact on the major stock indices of Indian stock markets. The major Indices namely, NSE National Stock Exchange) Nifty-50 index and BSE (Bombay Stock Exchange) Sensex index are chosen to study. Daily returns of the indices are computed and compared between before the war and during the war to verify the impact of Russia's invasion of Ukraine.

Keywords

Invasion, Nifty-50 index, Sensex, Daily Returns (DR),

INTRODUCTION

The state or time of war between regions or nations. A struggle between the opposition forces and with the aim of ending the war on poverty. The main causes include political, economic, and social inequalities; extreme poverty; economic downturn; poor government services; high unemployment rates; environmental degradation; and human (economic) motives for fighting. War raises serious ethical questions. It also raises important economic questions and potential implications. Existing studies of the economic effects of war focus on three issues: the direct costs of war; the costs of rebuilding an affected nation; and changes in oil prices and their major economic consequences. The major economic consequences of the war may stem from the temporary oil price shocks, the effects of short-term military spending, or the consequences of consumer confidence in investors' expectations for the future. The war will lower GDP per capita by reducing labor and total productivity by undermining existing and personal capital and reducing new and

human capital investments. The war will also lower GDP per capita by reducing profits in both domestic and foreign trade. In hindsight, the total cost of war comprises three components: (1) the potential cost of resources used to prosecute war; (2) the loss of lives and financial losses during the war; and (3) reduced GDP per capita as measured during and after the war.

War has a devastating effect on the economy. This field of research examines financial market responses to war events and began with studies of the effects of U.S. events. On the subject of inflation (Weidenmier 2002). This approach has been used to investigate the impact of war on a growing list of financial instruments during a growing set of wars (Pecquet and Thies 2010) Unfortunately, the effects of war events on money and debt are compounded by the possibility of inflation and deregulation. The effects of war events on stock market indicators appear to be very clear due to the impact of the war on real economic activity. Schneider and Troeger (2006) found similar effects in their study of stock market indicators during the last three wars. The discovery of the scale of the wars makes the analysis more accurate.

The proposed research intends to investigate the impact of Russia's invasion of Ukraine on Indian stock index returns and compare the returns of major indices (Sensex and Nifty Fifty) before and after the invasion.

REVIEW OF LITERATURE

David C. and Robert M. E. (2000) investigated the weak-form efficiency of the UK FT30 stock index from 1939 to 1945, demonstrating that the data has substantial structure, albeit in two separate subsets. When each data subset is fitted with a GARCH (p, q) model, R^{-2} values of roughly 19% are obtained, *indicating that the data does not follow a random walk. As a result, the weak-form efficiency hypothesis is ruled out.* Caplan (2002) says that wartime times have been viewed as natural macroeconomic experiments, *but data from pooled time series suggests otherwise.* On foreign soil, fought wars had marginally higher real production growth than periods of peace. The evidence supports monetarist, fiscalist, and mixed models of the post-war boom. Aliza Fleischer and Steven Buccola (2002) said that the Israeli hotel industry's supply and demand model is established, with distinctions made between the domestic and international sectors. *Foreign demand for hotel stays in Israel is highly price-elastic and income-inelastic, as well as sensitive to terrorist attacks.* Andrew Leigh, Justin Wolfers, and Eric Zitzewitz (2003) observed that financial data is analyzed by analysts to generate an ex-ante estimate of the economic effects of the Iraq war. Futures prices imply that markets expect these large immediate disruptions to dissipate quickly. *Oil prices rise by roughly $10 per barrel, and the value of US stocks falls by 15% as a result of the war.* Barbieri, Katherine & Jack Levy (2001) stated that in most situations, war has no major impact on economic partnerships among lesser powers or mixed dyads, according to the study. This statement is ***not contradicted*** by Anderton & Carter's

analysis. They present a compelling justification for the need for more research on the trade disruption hypothesis by generating plausible but provisional evidence that conflict is associated with a considerable decline in trade in a nontrivial number of circumstances. But, in their judgment, they go too far in claiming that the weight of the evidence favors the trade disruption premise. Anderton, Charles H. & John R. Carter (2001) suggest that war reduces trade greatly, *refuting Barbieri and Levy's prior claim*. The empirical findings of the authors support the liberal theory in a mixed way. There is little data to support their conclusion that conflict, on balance, impedes trade. Reuven Glick & Alan M. Taylor (2005) observe that almost all country's effects on bilateral trade are investigated. The authors assess the immediate and delayed effects of conflicts using the gravity model and find that wars have significant and long-lasting effects on commerce, and thus on national and global economic prosperity. It's possible that *the prices will be on par with the "direct" costs of war or more*. One of the recurrent concerns in the scientific study of war is the influence of conflict on financial markets. The authors show that conflicts have a negative impact on interactions at the core financial markets in the Western world using daily stock market data. They suggest that these *findings support the form of commercial liberalism based on rational expectations* (Gerald Schneider & Vera E. Troeger, 2006). In this research, Robert Simon Hudson and Andrew Urquhart (2015) found the impact of World War Two (WWII) on the British stock market. Overall, the researchers *discovered no evidence of substantial correlations between war occurrences and stock market results*. The "negativity effect," as documented by Akhtar et al., has some validity (2011). David Le Bris (2012) said that the impacts of war on the French stock market are examined in this research. *Evidence reveals that the manner in which a war is financed has an impact on the outcome of the conflict*. World *Wars I and II were largely supported by monetary creation, but the level of financial repression varied.* Stock values rose paradoxically, but only briefly, as a result of World War II. This study investigates the impact of major world events (MWEs) on global stock market prices. According to the authors, different types of MWE have distinct effects on stock markets. Only "positive" and "neutral" political events were found to have spill-over effects after an MWE (Davy Ghanem & David Rosvall 2014). According to Avni Önder Hanedara, & Elmas Yaldız Hanedar (2017), before the First World War, the Ottoman Empire was embroiled in Turco-Italian and Balkan conflicts, which resulted in massive land losses and risks for businesses, given *that the authors only see a brief and minor drop in stock prices, the findings are striking.* Markets moved evenly before the trade war, but there were negative swings and large tails during the trade war, according to Huynh, T. L. D., and Burggraf, T. (2020). All indicators of the European equity market agree with the conclusions. Trade conflicts represent a systemic risk to global markets, perhaps resulting in market downturns at the same time. Verdickt, G. (2020) revealed from the research that as a result of war news, managers and investors grew risk apprehensive. Managers reduced conflict risk by cutting dividends

and delaying first public offerings. *Following the outbreak of wars, foreign corporations were more likely to delist, and war-related events enhanced war press coverage.*

REVIEW SUMMARY

Wartime times have been viewed as natural macroeconomic experiments, but data from pooled time series suggests otherwise. War reduces commerce greatly. Researchers observed that financial data is analyzed to generate an ex-ante estimate of the economic effects of the Iraq war and found that conflicts have a negative impact on interactions in the core financial markets in the Western world using daily stock market data. Furthermore, researchers suggest that their findings support a form of commercial liberalism based on rational expectations. World Wars I and II were largely supported by monetary creation, but the level of financial repression varied. Stock values rose paradoxically, but only briefly, as a result of World War II. The researchers investigate the impact of major world events (MWEs) on global stock market prices. Different types of MWE have distinct effects on stock markets. But overall, the researchers discovered no evidence of substantial correlations between war occurrences and stock market results.

RESEARCH QUESTIONS

The following the research questions:

The Russian invasion of Ukraine has caused widespread consternation in global stock markets. On the day of the declaration of war, February 25th, 2022, major financial market indices plummeted. This is true of both the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE). However, a survey of the literature indicates inconsistent results; some academics suggest that war has a major negative influence on stock market returns, while others claim that it has just a minor impact. Hence, the following research questions are raised to investigate the impact of the Russian-Ukraine war:

a) Will there be a negative impact of the Russian-Ukraine war on the major indices of the Indian stock markets?
b) Will there be an impact of the Russian-Ukraine war on stock-market index returns?

RESEARCH PROBLEM

The researcher wants to check whether the Russian invasion of Ukraine had an impact on the BSE and NSE index returns in terms of daily returns before and during the war, as well as a comparison of the BSE and NSE index returns.

SIGNIFICANCE OF THE RESEARCH

In general, news of a war's outbreak has an economic impact on both the warring nations' economies and the economies of their neighbors. India has trading relations with both Russia and Ukraine. India has had strong connections with Russia since independence, with large amounts of trade and imports, as well as the purchase of military weaponry. In a similar vein, India excels in its commercial connections with Ukraine. In Russia, over 14000 students were enrolled in medical and other courses, while in Ukraine, over 20000 students were enrolled. Along with the nations implicated in the war, the commencement of the Russia-Ukraine war had an impact on Indian stock markets. The study is crucial because it provides the most up-to-date information on the impact of Russia's invasion of Ukraine on Indian stock markets, allowing investors to hunt for opportunities to participate in the markets.

OBJECTIVES OF THE RESEARCH

The following are the research objectives:

a) To calculate and evaluate daily market returns before and during the war between Russia and Ukraine.
b) to determine whether the war had a significant impact on daily market index returns before and during the war period.
c) To compare the BSE and NSE indices' daily returns before and after the war.

METHODOLOGY

The research framework is described as follows:

a) Data type, collection, period, and sources:

The data used for the research is secondary data. The data is collected for two months namely January and February 2022. There were 20 trading days in each month. The data is about the BSE Sensex and NSE Nifty-50. The data was collected from the respective sources namely www.bseindia.com and www.nseindia.com.

b) Data classification and tabulation:

The collected data on daily indices in relation to opening and closing values of BSE Sensex and NSE Nifty-50 are classified based on ‘before the war’ (January 2022) and ‘during the war’ (February 2022). Because there was speculation about the war likely to happen started from February 2022 itself and stock markets started reacting to the speculated news, February 2022 is taken ‘during the war’ period.

c) Sample size:

The data of the BSE Sensex NSE Nifty-50 for the period of January and February 2022 is collected with respect to each of the trading days in terms of the opening index and the closing values as stated in table 1.

Table 1. Sample size

	Number of observations	
	BSE Sensex	**NSE** Nifty-**50**
January 2022 (Before Breakout of war)	20	20
February 2022 (During the war)	20	20
Total	40	40

Source: The author

d) Statistical tools used:

The formulae to compute on daily index return used is stated as follows:

$$\textbf{Daily Return on Sensex (DRS)} = \frac{\{Closing\ index\ value\ on\ the\ day - opening\ index\ value\ on\ the\ day) * 100}{Opening\ index\ value\ on\ the\ day}$$

$$\textbf{Daily Return on Nifty-50 (DRN)} = \frac{\{Closing\ index\ value\ on\ the\ day - opening\ index\ value\ on\ the\ day) * 100}{Opening\ index\ value\ on\ the\ day}$$

Further, to analyze the market returns descriptive statistical tools like mean, standard deviation, and coefficient of variation are used. To test the hypotheses, the t-test is applied.

e) Research hypotheses

The following are the null hypotheses formulated to perform the test of the hypothesis:

i) There is no significant difference in the mean DR between the Nifty-50 index and the Sensex index before the war (January) period.

Nifty-50 Index DR Before the War = BSE Sensex Index DR Before the war

ii) There is no significant difference in the mean DR between the Nifty-50 index and the Sensex index during the war (February) period.

Nifty-50 Index DR during the War = BSE Sensex Index DR during the war

iii) There is no significant difference in the mean DR of the Nifty-50 index between before the war (January) and during the war (February).

Nifty50 Index DR Before the war = Nifty50 Index DR during the War

iv) There is no significant difference in the mean DR of the Sensex index between before the war (January) and during the war (February).

BSE Sensex Index DR Before the war = BSE Sensex Index DR during the War

RESEARCH RESULTS

The research results are presented as follows:

a) Sensex Vs Nifty50 – Before the war period

The t-Test, two-sample assuming unequal variances, is used to investigate data from the two indexes' (Sensex and Nifty50) DR during the time preceding the conflict, and the results are displayed in Table 6. It has been determined that there is no significant variance in the Sensex index's mean DR prior to the battle.

Table 6. t-Test: Two-Sample Assuming Unequal Variances

Trading sessions	Sensex DR Jan 22	Nifty-50 DR Jan 22	Description	Sensex DR Jan 22	Nifty -50 DR Jan 22
1	1.5	1.37	Mean	-0.064	0.0185
2	0.86	0.7	Variance	0.890909	0.837424
3	0.5	0.59	Observations	20	20
4	-0.22	-0.13			
5	-0.05	0.08			
6	0.54	0.5	Degrees of freedom	38	
7	0.45	0.32	t Stat	-0.28064	
8	0.22	0.23	P(T<=t) one-tail	0.390253	
9	-0.04	0	t Critical one-tail	1.685954	
10	0.3	0.39	P(T<=t) two-tail	0.780506	
11	0.15	0.4	t Critical two-tail	2.024394	
12	-1.1	-1.22			
13	-1.23	-1.05			
14	-0.97	-0.92			
15	0	0.02			
16	-2.6	-2.42			
17	1.22	1.63			
18	-0.07	0.28			
19	-1.03	-0.62			
20	0.29	0.22			

Source: The author

b) Sensex Vs Nifty50 – During the war period

The t-Test, two-sample assuming unequal variances, is used to investigate data from the two indexes' (Sensex and Nifty50) DR during the battle, and the results are displayed in Table 7.

It has been determined that there is no significant variance in the Sensex and Nifty50 indices mean DR during the battle.

Table 7. t-Test: Two-Sample Assuming Unequal Variances

Trading sessions	Sensex DR Feb 22	Nifty 50 DR Feb 22	Description	Sensex DR Feb 22	Nifty -50 DR Jan 22
1	0.32	0.27	Mean	0.0625	0.0015
2	0.45	0.42	Variance	1.140683	1.222319
3	-1.24	-1.17	Observations	20	20
4	-0.46	-0.42			
5	-1.59	-1.39			
6	0.02	-0.08	Degrees of freedom	38	
7	0.52	0.54	t Stat	0.177465	
8	0.2	0.29	P(T<=t) one-tail	0.430043	
9	-0.5	-0.44	t Critical one-tail	1.685954	
10	-0.55	-1.37	P(T<=t) two-tail	0.860086	
11	2.49	2.48	t Critical two-tail	2.024394	
12	-0.54	-0.5			
13	-0.56	-0.53			
14	0.6	0.23			
15	0.23	0.08			
16	1.53	1.45			
17	-0.7	-0.76			
18	-1.6	-1.82			
19	0.97	0.86			
20	1.66	1.89			

Source: The author

c) Nifty-50 index: Before and During the War

The nifty-50 index daily return (DR) for the two months (overall) and before and during the war is presented in table 2.

Table 2. Nifty-50 performance

Period	Mean DR	Std Dev (σ)	CV (%)	N
Jan-22 (Before the war)	0.019306	0.915568	4742.51	20
Feb-22 (During the war)	0.0015	1.105585	73705.68	20

2 Months	0.01	1.001768	10017.68	40
Source: The author				

In January and February 2022, there were a total of 40 trading transactions, 20 in each month. The mean DR for January was 0.0193 percent and for February was 0.0015 percent, with std dev (σ) of 0.915568 and 1.105585, respectively, giving in a Coefficient of Variation (CV) of 4742.51 and 73705.68, respectively, implying that the mean DR during the war was lower than before the war.

Test of hypothesis

The data of DR the two periods is tested by means of t-Test - two-sample assuming unequal variances and the results are presented in Table 3. It is revealed that there is no significant difference in the mean DR of the Nifty-50 index between before the war and during the war periods. Implying that war has no impact on the mean DR of the NSE Nifty-50 index.

Table 3. t-Test: Two-Sample Assuming Unequal Variances – Nifty50

Trading sessions	Jan DR Nifty50	Feb DR Nifty50	Description	Jan DR Nifty50	Feb DR Nifty50
1	1.37	0.27	Mean	0.0185	0.0015
2	0.7	0.42	Variance	0.837424	1.222319
3	0.59	-1.17	Observations	20	20
4	-0.13	-0.42	Hypothesized Mean Difference	0	
5	0.08	-1.39	Degrees of freedom	37	
6	0.5	-0.08	t Stat	0.052973	
7	0.32	0.54	P(T<=t) one-tail	0.479019	
8	0.23	0.29	t Critical one-tail	1.687094	
9	0	-0.44	P(T<=t) two-tail	0.958038	
10	0.39	-1.37	t Critical two-tail	2.026192	
11	0.4	2.48			
12	-1.22	-0.5			
13	-1.05	-0.53			
14	-0.92	0.23			
15	0.02	0.08			
16	-2.42	1.45			
17	1.63	-0.76			
18	0.28	-1.82			
19	-0.62	0.86			
20	0.22	1.89			
Source: The author					

d) Sensex index

The Sensex index daily return (DR) for the two months (overall) and before and during the war is presented in table 4.

Table 4. Sensex performance

Period	Mean DR	Std Dev (σ)	CV (%)	N
Jan-22	-0.0632	0.943446	-1492.5	20
Feb-22	0.06128	1.067547	1742.02	20
2 Months	-0.03923	0.979397	-2496.5	40

Source: The author

There was a total of 40 trading transactions in January and February 2022, 20 in each month. The mean DR in January was -0.0632 percent, and in February it was 0.06128 percent, with standard deviations of 0.943446 and 11.067547, respectively, yielding a Coefficient of Variation (CV) of -1492.5 percent and 1742.02 percent, implying that the mean DR during the war was higher than before the war. The combined mean DR for both periods was found to be negative.

Test of hypothesis

The data from the two periods of DR is examined using the t-Test - two-sample assuming unequal variances, and the findings are shown in Table 5. It is discovered that there is no substantial variation in the mean DR of the Sensex index during the war. Inferring that war has no effect on the BSE Sensex index's mean DR.

Table 5. t-Test: Two-Sample Assuming Unequal Variances - Sensex

Trading sessions	Jan-22 DR Sensex	Feb-22 DR Sensex	Description	DR Jan 22	DR Feb 22
1	1.5	0.32	Mean	-0.06321	0.061282
2	0.86	0.45	Variance	0.890091	1.139657
3	0.5	-1.24	Observations	20	20
4	-0.22	-0.46			
5	-0.05	-1.59			
6	0.54	0.02	Degrees of freedom	37	
7	0.45	0.52	t Stat	-0.39079	
8	0.22	0.2	P(T<=t) one-tail	0.349097	
9	-0.04	-0.5	t Critical one-tail	1.687094	
10	0.3	-0.55	P(T<=t) two-tail	0.698194	
11	0.15	2.49	t Critical two-tail	2.026192	
12	-1.1	-0.54			
13	-1.23	-0.56			

14	-0.97	0.6	t- stat (-0.39079) is less than t-Critical one-tail (1.687094) and also t-Critical two-tail (2.026192). Hence, the ***null hypothesis is accepted.***
15	0	0.23	
16	-2.6	1.53	
17	1.22	-0.7	
18	-0.07	-1.6	
19	-1.03	0.97	
20	0.29	1.66	
Source: The author			

SUMMARY, IMPLICATIONS, AND CONCLUSION

The summary, implications, and conclusion of the research are stated as follows:

a) Prior to the war (January 2022), the mean DR of the Nifty50 and the Sensex indices were not significantly different, meaning that the major indexes of the Indian stock market were going in the same direction and generating the same daily returns on average.

b) The Nifty50 index's mean DR before the war was the same as it was during wartime. This suggests that the NSE Nifty50 index's daily returns have not been adversely affected and that investors who have invested in Nifty50 index-based equities have not been adversely affected by the battle.

c) The Sensex index's mean DR before the battle was the same as it was throughout the war. This indicates that the BSE Sensex index's daily returns have not been impacted and that investors who have invested in Sensex index-based securities have not been significantly affected.

d) During the war (February 2022), the mean DR of the Nifty50 and the Sensex indices were not significantly different, showing that investors who invested in index-based equities were unaffected by Russia's invasion of Ukraine.

The study's conclusion is that investors should invest in index-based companies to prevent the negative effects of the war. Furthermore, investors have the option of investing their funds entirely on Sensex index-based stocks or entirely on Nifty50 index-based securities, or they can invest 50% of their funds on Sensex index-based companies and the remainder on Nifty50 based securities. The caveat is that when spreading the investment, all of the stocks in the index must be covered equally.

SCOPE FOR FUTURE RESEARCH

The following topics are recommended for future investigation by the researchers:

a) The Impact of Russia's Invasion of Ukraine - A comparative study of major BRICS (nations) stock indices.

b) Analytical research of major stock indices in the European Union and the United States during Russia's invasion of Ukraine.

c) The Economic Impact of Russia's Invasion of Ukraine: A Comparison of the World's Key Commodity Market Indices.

d) The Impact of Russia's Invasion of Ukraine: A Comparison of Currency Market Prices in the World's Major Economies

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