


IMPACT OF THE RUSSIA-UKRAINE WAR ON THE INDIAN AND US STOCK MARKETS



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ABSTRACT

The Russian-Ukraine war started on January 24, 2022, creating contagion effects in the global financial market. The study investigates the stock market reactions of India and the USA to the Russia-Ukraine War using an Event study and the VAR Model. During this study, it was transparent that the war-affected different stock markets in different ways. The level of impact depends upon how much these countries are involved in the War. The event study found that both Indian and USA stock markets were positively impacted after the War. From VAR, it was also seen that the Indian stock market had a positive return spill over from USA stock market post-war. The chapter contributes for the effective decision making of investors and stock market analyst.

Keywords	Russian-Ukraine War, Return spill over, Event Study, VAR
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INTRODUCTION

On February 24, 2022, the Russian invasion took place. The Russo-Ukrainian Cold War almost turned into World War III. The conflict between the two countries is increasing and affecting the whole world, including the stock market. Disasters in Russia and Ukraine could worsen the economic system and markets. Russia produces significant commodities, including palladium, in catalytic converters for gasoline vehicles, and their load contributes to excessive inflation in the United States and India. During this war outbreak, firms that can withstand transition risk did well, especially in U.S. It is seen that there is a transition to a low-carbon economy.

Europe's high-conversion risk stocks did not show such a notable upswing. From an industry perspective, these stocks have underperformed during the hatching period. The result may be due to more robust expected policy responses. In Europe's relative dependence on Russian oil and gas, supporting renewable energy sources is believed to be the only way for Europe to improve energy security. In short, the transition rate to a low-carbon economy appears to be the difference between the USA and Europe.

India's benchmark fell 3% in the initial stage of the war, prompting investors to dump high-risk assets into safer assets. The current situation in Russia and Ukraine is also affecting mature markets like the United States, where the S & P 500 fell more than 7%. US Fed has implemented quantitative restrictions to reduce inflation, but the current scenario of commodity price increases will have a cascading effect. With the two largest economies globally, the impact is visible in the Indian stock market with escalating geopolitical tensions that could force foreign investors to repatriate capital, which will be negative for stocks and the rupee.

REVIEW OF LITERATURE

The War in Ukraine was a challenge for the economy, shocking everyone and leaving the losers out of certain energy exporters (Liadzel, Macchiarelli, Lee, Juanino 2022). The war added fuel to already rising fuel prices and inflation. Central banks do not know what to do in the face of rising interest rates. There is complete uncertainty about business operations and possible gas supply disruptions in Europe. India has adopted a neutral position created from a historic strategic partnership with Russia (Meena 2022). The Cold Storage Alliance is a multifaceted diplomatic, defense, nuclear energy, and technology organization that puts Russia at the heart of India's nation-building process, especially during this time. However, this is unlikely to protect India from the ravages of a war of such magnitude. Especially in global



geopolitics, India and Russia today find themselves increasingly attached to two other great powers, China and the United States.

Although major geopolitical events have worldwide consequences, their economic influence varies dramatically across space. A high "proximity penalty" was identified when analyzing stock market reactions to the situation in Ukraine. In the few weeks leading up to the start of the conflict, neighboring countries experienced an abnormal drop in equity indices of 23.1 percent on average. The influence is reduced by 2.6 percentage points when a country's distance from Ukraine is increased by 1,000 kilometers. Even when trade-related spillovers are considered, an extra 1,000 kilometers in the distance equates to 1.0 percentage points in equities returns. A probable driver of the proximity penalty is military spillover risk (Federle, Müller, Meier, & Sehn, 2022).

The consequence of the Russian charge of Ukraine in 2022 created negative cumulative abnormal returns for global stock market indices, albeit with varied consequences, using an event study methodology. According to cross-sectional analysis, economic globalization, as measured by GDP-scaled trade, is inversely associated with event-day and post-event returns. Markets in NATO countries showed greater returns, corresponding to the predicted economic stimulus of military preparation. According to the findings, markets in more globalized economies are more vulnerable to foreign wars, although substantial differences exist (Boubaker, Goodell, Pandey, & Kumari, 2022).

The stock market reaction of 381 companies with Russian exposure during the first 20 (30) trading days after the conflict was that there were significant negative average abnormal returns of -2.65 percent (-4.06 percent), showing that all enterprises with Russian operations were significantly affected. Focusing on companies' strategic decisions about their Russian activities, enterprises that decide to leave Russia earn significantly less than those that remain to operate or have not made a definitive decision. Furthermore, we discover that the adverse market reaction is stronger for European manufacturers who have announced their plans to leave Russia and European service firms who have decided to stay, implying that the industry plays a role. (Berninger, Kiesel, & Kolaric, 2022)

In their study, Kang and Meernik (2005) investigated the effect of the Civil War on several economies from 1960 to 2002. They have found that the war has a negative impact on economic basics, and the international community's response to the Civil War substantially impacts economic growth.



Previous studies on the consequences of war have shown that conflict has significant economic consequences, which raise concerns about the duration of the war or conflict, how Russia will respond to sanctions, the impact on the global economy, and the reaction of global financial markets. The Standard and Poor (S &P) 500 index recorded the first correction since October 2020, as it fell by more than 10% from the recent peak.

Country-level analysis confirms that firms in European countries have experienced a considerable decline in cumulative abnormal returns. In contrast, firms in countries far away from Ukraine and Russia are not significantly affected. Sector-level analysis shows that the manufacturing sectors of European countries are mostly affected by the war. Finance and services have been negatively affected more significantly than manufacturing. Other scholars pointed out that developing countries will likely suffer from civil war and get income shocks.

The study on the Russo-Ukrainian War and its effects on the stock market (Ahmad 2022) focuses on the US stock market. He believes that the war directly affects US profits and other developed markets. Moreover, Russian exports have been at the heart of the recent rise in inflation, including energy products used in cars and trucks. Thus, the increase in petrol prices will increase the price of cars, further exacerbating the situation.

Further study on stock prices and the War between Russia and Ukraine, which concerned sanctions, energy, and legislation by (Deng, Leipold, and Wang) (2022), mentioned how Russia's invasion of Ukraine puts stocks at risk of shifting into a weak economy which is true in the case of the US stock market. After the invasion, US stocks underperformed their previous performance. Linking different environmental, social, and governance (ESG) metrics to stock price performance yielded different results, suggesting that investors cannot easily rely on these metrics. Common to demonstrate the resilience of companies in the face of a crisis.

The study examines the stock market's response to the Russian invasion on February 24, 2022 (Sun, Song, Zhang 2022). We note that war affects stock markets from country to country using the event research approach—moreover, sectors depend on the degree of involvement of nations or sectors in the war. Country-level analysis confirms that companies in EU countries have experienced a significant drop in extraordinary cumulative profits, while companies in other countries far from the battlefield are unlikely to be significantly affected. . Industry-level analysis shows that the manufacturing sector in EU countries was heavily affected by the war and the financial and service sectors were negatively affected to a greater extent than the industry sector.



Since Russia invaded Ukraine, Russian sanctions' direct and indirect impact on international equity markets was calculated. Sanctions-levying countries have more substantial institutional quality and lower corruption rates than non-sanction-levying countries. On average, sanctions on Russia cost each country's stock market 0.11 trillion dollars or -2.39 percent. According to a back-of-the-envelope assessment, the Russian stock market lost between 137 billion and 353 billion dollars or 7% to 20% of the country's annual GDP which is caused alone by the mentioned sector and the combined effect of the invasion and sanctions. The average equities market loss for countries that impose sanctions on Russia is close to 3% of GDP, whereas the loss that Russia suffers as a percentage of its entire GDP is between 16 and 43 percent. (Huang & Lu, 2022)

RESEARCH OBJECTIVES

1. To identify the impact of the Russia-Ukraine War on Indian and US stock markets.
2. To understand the return spillover of S&P 500 to NIFTY 50 before and after the war.

RESEARCH METHODOLOGY

In this study, daily closing values of India and United States indices, shortened Nifty 50 and S&P 500, are respectively taken. The historical data was collected from the database of Yahoo Finance and Market Watch. The data from January 21 to 24th (2 months) March is used. An *event study* is a tool used to understand the impact of the Russia-Ukraine War on India and the US stock market. An event study involves analyzing whether the past occurrences of a given type of event create a significant effect on the financial market.

Vector automatic regression (VAR) is a statistical model used to capture the relationships between many quantities as they change over time. Vector Auto Regression (VAR) is also used to understand the impact of India on US stock market returns pre- and post-Russia- Ukraine war.

RESULTS

The Event Study results, descriptive statistics, and Vector Auto Regression (before and after the war) are presented in Table 1. The sample means are positive for Indian and USA stock returns. As measured in Standard deviation, the volatility decreased during the post-Russia-Ukraine War period in both stock markets. From the Jarque-Bera test statistics, the null hypothesis that the return series is normally distributed is accepted. From figure 1, it was found that there were fluctuations in both countries' stock markets. Further, it was noticed that there



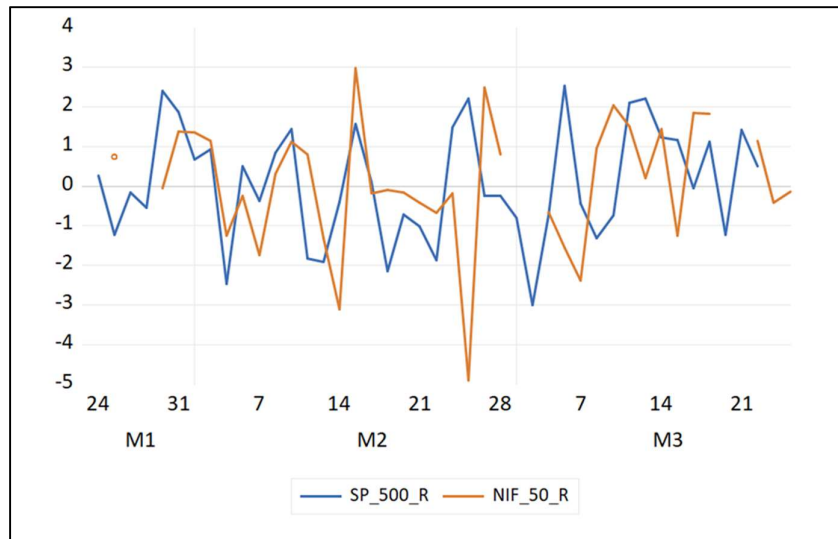
was a more significant decline in the Nifty compared to the S&P 500 on the day of the War (February 24, 2022).

Table 1: Descriptive Statics of index return

Pre-war period			Post-war period		
	NIF_50_R	SP_500_R		NIF_50_R	SP_500_R
Mean	-0.210570	-0.012610	Mean	0.496061	0.197172
Median	-0.163667	-0.030846	Median	0.876565	-0.141339
Maximum	2.981035	2.405589	Maximum	2.494786	2.537367
Minimum	-4.896027	-2.469348	Minimum	-2.380786	-2.996252
Std. Dev.	1.678816	1.446152	Std. Dev.	1.431339	1.450121
Skewness	-0.930771	-0.041748	Skewness	-0.497325	-0.181852
Kurtosis	4.532131	1.915577	Kurtosis	2.166899	2.551607
Jarque-Bera Probability	5.086171 0.078623	1.182944 0.553512	Jarque-Bera Probability	1.122257 0.570565	0.250002 0.882496
Sum	-4.421971	-0.302644	Sum	7.936972	3.549099
Sum Sq. Dev.	56.36845	48.10117	Sum Sq. Dev.	30.73099	35.74848
Observations	21	24	Observations	16	18

Data Source: Author compilation

Figure 1: Daily Index series for the study period



Data Source: Author compilation

While studying the event's impact (Table 2), it was inferred that post-war Nifty performed 0.155% positively compared to the pre-war period. However, this positive performance does not show a sizable difference between the pre-war period. A similar positive performance of 0.41% was observed when moving to the USA stock market, which made more impact than the Nifty (Table 2.1).



Table 2: Event study for NIFTY 50

Dependent Variable: NIF_50_R				
Method: Least Squares				
Date: 05/09/22 Time: 12:37				
Sample (adjusted): 1/25/2022 3/24/2022				
Included observations: 37 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.023703	0.361372	0.065591	0.9481
@AFTER("02/24/2022")	0.155176	0.533127	0.291068	0.7727
R-squared	0.002415	Mean dependent var	0.095000	
Adjusted R-squared	-0.026088	S.D. dependent var	1.595426	
S.E. of regression	1.616103	Akaike info criterion	3.850451	
Sum squared resid	91.41260	Schwarz criterion	3.937527	
Log likelihood	-69.23334	Hannan-Quinn criter.	3.881149	
F-statistic	0.084721	Durbin-Watson stat	2.250298	
Prob(F-statistic)	0.772717			

Data Source: Author compilation

Table 2.1: Event study for S&P 500

Dependent Variable: SP_500_R				
Method: Least Squares				
Date: 05/09/22 Time: 12:46				
Sample (adjusted): 1/24/2022 3/22/2022				
Included observations: 42 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.109359	0.299512	-0.365124	0.7169
@AFTER("02/24/2022")	0.412607	0.445310	0.926562	0.3597
R-squared	0.021012	Mean dependent var	0.077297	
Adjusted R-squared	-0.003463	S.D. dependent var	1.433930	
S.E. of regression	1.436410	Akaike info criterion	3.608619	
Sum squared resid	82.53096	Schwarz criterion	3.691365	
Log likelihood	-73.78100	Hannan-Quinn criter.	3.638949	
F-statistic	0.858517	Durbin-Watson stat	1.666461	
Prob(F-statistic)	0.359711			

Data Source: Author compilation

In order to understand the spillover effects of the Nifty 50 and S&P 500, a vector autoregression tool was used. The lag length considered for pre- and post-war periods is 1 and 2. During the pre-war period, India's first and second lag has a significant negative return spillover on the USA and its stock market. It was also observed that USA's second lag has a more significant spillover effect on Indian stock market returns. On the contrary, India's lags have a significant positive spillover return on the USA stock market.



Table 3: Vector Auto Regression estimates before War

Vector Autoregression Estimates		
Date: 05/09/22 Time: 12:57		
Sample (adjusted): 2/01/2022 2/24/2022		
Included observations: 18 after adjustments		
Standard errors in () & t-statistics in []		
	NIF_50_R	SP_500_R
NIF_50_R(-1)	-0.718464 (0.35740) [-2.01025]	-0.646456 (0.29942) [-2.15904]
NIF_50_R(-2)	-0.790767 (0.35052) [-2.25601]	-0.701496 (0.29365) [-2.38887]
SP_500_R(-1)	0.109408 (0.31597) [0.34626]	0.219430 (0.26471) [0.82894]
SP_500_R(-2)	1.092273 (0.34550) [3.16146]	0.326656 (0.28945) [1.12855]
C	-0.211681 (0.35741) [-0.59227]	-0.092759 (0.29942) [-0.30979]
R-squared	0.450685	0.444870
Adj. R-squared	0.281665	0.274061
Sum sq. resids	28.82713	20.23251
S.E. equation	1.489118	1.247536
F-statistic	2.666460	2.604489
Log likelihood	-29.77940	-26.59317
Akaike AIC	3.864378	3.510352
Schwarz SC	4.111703	3.757677
Mean dependent	-0.361336	-0.163429
S.D. dependent	1.756975	1.464210
Determinant resid covariance (dof adj.)		3.201869
Determinant resid covariance		1.670111
Log likelihood		-55.69780
Akaike information criterion		7.299755
Schwarz criterion		7.794406
Number of coefficients		10

Data Source: Author compilation



Table 3.1: Vector Auto Regression estimates after War

Vector Autoregression Estimates		
Date: 05/09/22 Time: 12:59		
Sample (adjusted): 2/25/2022 3/17/2022		
Included observations: 11 after adjustments		
Standard errors in () & t-statistics in []		
	NIF_50_R	SP_500_R
NIF_50_R(-1)	-0.226399 (0.23679) [-0.95610]	0.370971 (0.10056) [3.68894]
NIF_50_R(-2)	0.300481 (0.30428) [0.98752]	0.355583 (0.12922) [2.75171]
SP_500_R(-1)	-0.845193 (0.46287) [-1.82597]	0.143626 (0.19658) [0.73064]
SP_500_R(-2)	0.218264 (0.37079) [0.58864]	-0.024849 (0.15747) [-0.15780]
C	1.478870 (0.67759) [2.18255]	0.485497 (0.28776) [1.68715]
R-squared	0.374961	0.821077
Adj. R-squared	-0.041732	0.701795
Sum sq. resids	13.82537	2.493522
S.E. equation	1.517969	0.644660
F-statistic	0.899849	6.883490
Log likelihood	-16.86568	-7.445228
Akaike AIC	3.975578	2.262769
Schwarz SC	4.156440	2.443630
Mean dependent	0.865455	0.439626
S.D. dependent	1.487253	1.180520
Determinant resid covariance (dof adj.)		0.799870
Determinant resid covariance		0.237978
Log likelihood		-23.32097
Akaike information criterion		6.058359
Schwarz criterion		6.420082
Number of coefficients		10

Data Source: Author compilation



CONCLUSION

The paper studies the impact of the war between Ukraine and Russia on India and the USA's market returns and investigates the spillover effects concerning pre- and post-war using an event study and VAR model. Even before war broke out in Ukraine, investors around the world were faced with a unique and challenging combination of events: economic activity restarting post-COVID19, fears about new virus strains, soaring inflation, and new central bank and monetary policy frameworks, among others which can be seen through the fluctuation before the war. Since the study was confined to a short period, the results showed a positive effect of the Ukraine-Russia war on the stock indices. However, India had a substantial return spillover on the USA during both pre-post periods.

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