The Russia-Ukraine war and stock market volatility: lessons from selected South Asian countries

Nishat Rumaly, Md Mehedi Hasan, Uttam Golder, Barnali Roy

The Russia–Ukraine war and stock market volatility: lessons from selected South Asian countries

Nishat Rumaly and Md Mehedi Hasan

Department of Finance and Banking,
Jashore University of Science and Technology,
Jessore, Bangladesh
Email: nishat.du17@gmail.com
Email: mehedi.just11@gmail.com

Uttam Golder*

Department of Finance and Banking,
Jashore University of Science and Technology,
Jessore, Bangladesh
and
Department of International Business,
University of Dhaka,
Dhaka, Bangladesh
Email: uttamgolder@gmail.com
*Corresponding author

Barnali Roy

Department of Economics,
Bangabandhu Sheikh Mujibur Rahman
Science and Technology University,
Gopalganj, Bangladesh
Email: br684551@gmail.com

Abstract: This study examines how the ongoing war between Russia and Ukraine affects the stock markets of selected South Asian nations. Although several studies in developed countries have explored the footprint of this dispute on the equity market, the impression of this war in the South Asian context is still underexplored. Using data from August 2014 to November 2022, we inquire about the aftermath of the Russia–Ukraine war on stock market volatility and its return in five selected South Asian countries: Bangladesh, India, Pakistan, Sri Lanka and Nepal. Applying Generalised Auto-Regressive Conditional Heteroskedasticity-in-Mean (GARCH-M) model, we find that the war increases the volatility of stock markets. Besides, we also identify that the war negatively impacts the equity return. Our study recommends that the battle must end right now and rigorous regulatory adjustments be implemented to mitigate the financial damages resulting from the conflict.

Biographical notes: Nishat Rumaly serves as a Lecturer in the Department of Finance and Banking at Jashore University of Science and Technology. She is Graduating from the University of Dhaka with Dean's Honor and Merit Awards, she previously served as Adjunct Faculty at Fareast International University, Dhaka. Nishat, driven by a keen interest in research, explores stock market dynamics, green banking, capital structure and financial inclusion. Her remarkable achievements include multiple publications in esteemed journals. With a strong academic foundation and a passion for advancing knowledge, she stands out as a dynamic educator and researcher in the realms of Finance and Banking.

Md Mehedi Hasan is an Enthusiastic MBA student who successfully Graduated from the Finance and Banking Department at Jashore University of Science and Technology, Bangladesh. He actively engaged in workshops, training programs and national and international conferences throughout his university years. In addition to his academic endeavours, he actively participated in extra-curricular and social welfare activities. His primary interest lies in research, particularly in areas like the stock market, green banking, capital structure, financial inclusion and other contemporary subjects.

Uttam Golder is an Assistant Professor in Finance and Banking at Jashore University of Science and Technology, Bangladesh. He is a dedicated academic with a background as a Lecturer in the same department. Currently, he is pursuing Full-Time Doctoral studies in Financial Technology (fintech) at the University of Dhaka, Bangladesh. His expertise lies in fintech, fintech adoption, and green and alternative financing through fintech channels. He has showcased his research prowess with multiple publications in reputable journals. As a forward-thinking scholar, he contributes significantly to the evolving landscape of financial technology, solidifying his position as a notable figure in the field.

Barnali Roy received Graduate and Postgraduate degrees in Economics from Bangabandhu Sheikh Mujibur Rahman Science and Technology University in Gopalganj, Bangladesh. She has consistently demonstrated brilliance and creativity throughout her academic journey. With a keen interest in research, her focus extends to dynamic areas such as the stock market, financial inclusion, labour transitions from agriculture to non-agriculture sectors and other contemporary subjects. She commitment to excellence and her passion for pushing the boundaries of economic research showcase her as a promising and forward-thinking professional in the field.

1   Introduction

The ongoing war of Russia–Ukraine was initiated on 24 February 2022. The conflict has brought about a terrible national catastrophe, endangered the stability of geopolitical relations, decelerated global growth, massive inflation and debt and poverty rates (Orhan,

2022). Moreover, it has affected the international market severely as these countries are a great source of many crucial natural resources (Jagtap et al., 2022). This conflict has disrupted the worldwide supply network for food following Covid-19, and the long-lasting effect comes from interrupting food production, supply networks, businesses and economies (Prohorovs, 2022). It puts at risk the accessibility of numerous primary resources and final goods, and recent spikes in food prices have been observed in the global markets (Jagtap et al., 2022; Nasir et al., 2022).

Because of US sanctions on Russia, its exports have been restricted, and the fighting has limited ports for Ukraine. The war involving Russia and Ukraine has also affected commerce. As a result of the dispute, corn futures on the Chicago Futures Exchange have surged. Several Western nations import fossil fuel from Russia for their heating systems and run businesses. Within days, the fighting increased the cost of commodities, including oil, natural gas and other goods, which led to global inflation (Cohen, 2022). Likewise, South Asian nations are highly concerned about the Russia–Ukraine war because of its possible effects on international law, energy security, diplomacy, global economics and geopolitics. The conflict's aftermath impacts these nations' security, economic stability and diplomatic ties since they depend on stable international relations and energy supply. South Asian nations may see disruptions in the energy supply, heightened global economic instability, strained diplomatic relations, difficulties obtaining defence equipment and a deterioration of international law and norms if the Russia–Ukraine war drags on. These issues may impact their energy security, economic expansion, security agreements and regional stability.

Global financial markets began their precipitous decline as word of the Russia–Ukraine conflict spread. The US equity market index and European equities dropped by 1% and 1.3%, respectively. Besides, the S&P/ASX 200 in Australia and the Shanghai Composite Index also fell by 1.4% and 1.2%, correspondingly (Kamal et al., 2023). Moreover, the MOEX index in Moscow falls by about 9% (Izzeldin et al., 2023). DSEX, the primary index of the Dhaka stock exchange, fell by 8.1% or 549 points, closing at 6206.8 points on 28 December 2022 (Rahman, 2022). In India, Nifty Smallcap and Midcap decreased by 6.25% and 5.74%, respectively. Besides, the Nifty 500, the most comprehensive index on NSE, finished the day with a 5.04% decrease (Mudgill and Raj, 2022). Pakistan's equity market suffered a severe blow on February 2022 as the KSE 100 index plummeted by 3%, and the market closed at 43,831 points after dropping 1302 points, reflecting the market's sharp downturn and raising concerns among traders and analysts (Ahmed, 2022). Amid Sri Lanka's ongoing severe economic crisis, the country's shares experienced a significant decline on February 2022, closing 5% lower. The global stock markets also collapsed following Russia's aggression on Ukraine. Information technology and energy stocks faced notable drops on the CSE All-Share Index (CSE), contributing to the overall downturn as the index ended at 10,657.05 points, down by 5% (Reuters, 2022). The commencement of the Russia–Ukraine war also had a notable consequence on the equity market of Nepal, resulting in a decrease in return of the Nepal Stock Exchange (NEPSE) during the initial 30 days of the war. Figure 1 shows how the daily percentage of the DSEX, Nifty 500, KSE 100, CSE All-Share and NEPSE index changed over time. Here, it is clear that there were ups and downs in the daily percentage change of the aforementioned shares. However, KSE 100 and NEPSE faced more uncertain situations and Nifty 500 faced comparatively stable situation than the others.

Figure 1 Daily percentage change of DSEX, Nifty 500, KSE 100, CSE All-Share and NEPSE (August 2014 to November 2022) (see online version for colours)
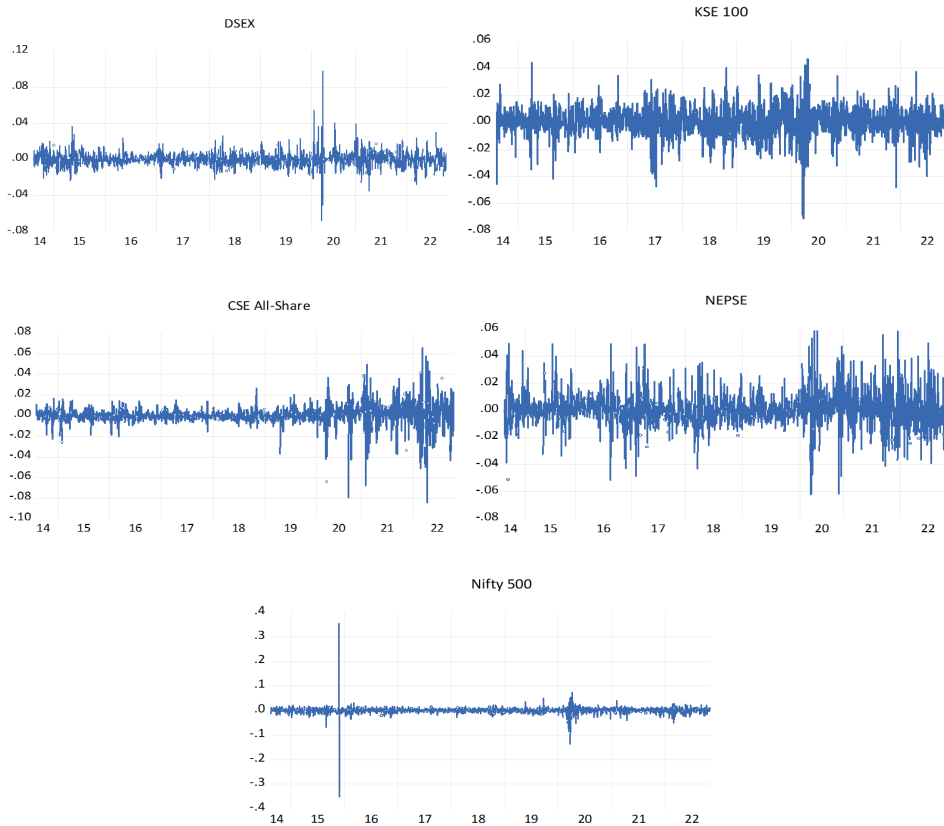
Source: Author's calculation.

It is crucial to comprehend how the Russia–Ukraine war affects stock markets, as financial markets are highly susceptible to developments in geopolitics. Any noteworthy stories in the dispute could cause market volatility, impacting portfolios, investments and the economy's stability. Firms, politicians and investors must evaluate and adjust to these swings to minimise financial risks and make well-informed decisions. Considering the current condition of different stock markets, this study investigates the volatility levels of the stock markets in five chosen Asian nations amidst the inevitable conflict between Russia and Ukraine. For this purpose, this study provides a comprehensive understanding of five stock market indices, namely DSEX, Nifty 500, KSE 100, CSE All-Share and NEPSE, during the war period. Additionally, it provides a comparative analysis to determine the extent of volatility in these indices caused by the Russia–Ukraine war. This study aims to understand how this conflict has impacted financial markets and investor behaviour. Analysing stock market performance, it also focuses on essential issues in the repercussions of geopolitical events. The outcomes of this study help investors make informed decisions and allow financial institutions to adapt their strategies accordingly. Ultimately, this investigation adds to our knowledge of how international tensions affect

financial markets, shedding light on the broader implications for the financial realm. Moreover, our study can stimulate the economy of the area by highlighting the risks brought about by this conflict. Offering information about possible dangers and ways to reduce them will help South Asian countries make more educated investment choices and improve their economic stability. In this way, our article can contribute to developing economic growth and resilience in the face of geopolitical uncertainty.

To our best understanding, this research is the initial in-depth evaluation of how the Russia–Ukraine battle affects the fluctuation of the indexes of the selected South Asian countries. Several scholarly investigations have been conducted about the Russo-Ukrainian conflict within the Asian region (Beraich et al., 2022; Saini et al., 2023; Yousaf et al., 2022), but scarce in the South Asian zone. Thus, the outcomes of this study offer imperative lessons for financiers, officials and financial institutions, helping them understand the interconnectedness between global events and regional financial markets and enabling them to make informed decisions and formulate strategies to mitigate risks and enhance market stability. The remaining parts of the research are organised as follows: Section 2 labels related literature, Section 3 interprets data and method, results and findings are in Section 4 and finally, Section 5 closes the study and identifies some policy implications.

2   Literature review

The stock market might be influenced by sudden events like war, conflicts and religious occasions, causing price fluctuations and impacting consumer behaviour, investor sentiment and economic activity (Caballero and Arbiol, 2022; Golder et al., 2022). Traders continually closely monitor these factors for informed decision-making. Wang et al. (2021) explored the reaction of Chinese companies' equity markets to the US-China trade War. The author's findings imply that the trade War has a detrimental impact, as companies with a larger share of past exports to the US display more pronounced adverse market reactions. This effect is most prominent among non-state-owned firms. Additional evidence demonstrates that the negative consequences primarily stem from firms directly exposed to tariff escalations. Brune et al. (2011) examined the contradictory impact of global conflicts on equity markets and discover that war escalation generally leads to decreased stock prices. Jayakody (2017) focused on the Sri Lankan Civil War crash on equity market performances. The study employs the mean adjusted returns model to examine the reactions of 19 industries in the Colombo Stock Exchange to nine selected terrorist attacks. Analysing daily data from 2006 to 2009, the event study indicates that anarchist violence has a meaningful, significant influence that varies economic sectors.

Numerous researchers and econometricians have offered various models (e.g., vector autoregressive and event study) to understand the fluctuation in the stock market because of the Russia and Ukraine war (Beraich et al., 2022; Le et al., 2022; Umar et al., 2022). Generally, an escalation of the war is terrible for investors and the stock market (Hoffmann and Neuenkirch, 2017). Beraich et al. (2022) compared three international markets, including American, European, and Chinese stock markets, to investigate the volatility spillover effect before and during the Russia–Ukraine conflict. These comparisons were prepared statistically and dynamically using the VAR model, and the dynamic analysis shows the highest instability in the US market. In contrast, the static

analysis of index connectedness and variability between indices represents that connectivity was lower before the war than after. Boungou and Yatie (2022) analysed 94 countries' equity markets to reveal the impression of war on the market. The study finds a negative correlation on all market indices used for the study from 22 January to 24 March 2022. Before and after the hostilities outbreak between Russia and Ukraine, Le et al. (2022) analysed market performance. This study reveals that the conflict has a positive impression on the defence market and a critical impact on the air transport industry. In this vein, Nerlinger and Utz (2022) conducted a study of 1630 energy companies of major continents and found that cumulative average abnormal returns are positive, meaning that energy companies outperformed the stock market throughout the war, where North American companies performed better than European and Asian ones. Nivorozhkin and Castagneto-Gissey (2016) explored the impression of the safety and political crunch in Ukraine on the activity of the equity markets of Russia and a significant sample of the global marketplace. Ben Hassen and El Bilali (2022) depict that conflict has impacted countries that depend on imported food. Farmers cannot work in their fields, and labour shortages result from conscription and population displacement. Alam et al. (2022) disclose that war has affected global and commodities markets, including oil, gas, platinum, gold and silver. Owing the ongoing conflict, there has recently been a significant movement in commodity prices on financial markets worldwide, and the authors reveal that all goods and markets in G7 and BRIC are connected firmly.

The empirical investigation by Yousaf et al. (2022) demonstrated the importance of the 'special military mission' notice (event day), which negatively impacted the entirety of the market, with the most significant influence of Russia. Besides, Slovakia, Hungary, Russia and Poland's financial markets experienced negative returns before and after the incident. Moreover, the stock markets of Spain, South Africa, Romania, Japan, Italy, India, Germany, France, Australia and Turkey experienced adverse effects after the invasion. This study recommends that investors put their money in Middle Eastern, Latin American, North American and African areas since they are less affected. Basdekis et al. (2022) analysed the impression of the Ukrainian conflict on equity and energy markets and reveal that the Russia Trading System Index (RTSI) significantly influences European and American stock markets and the Russian currency. Besides, capital limitations in the Russian equity market and mounted pressure for fossil fuels established a link between the RTSI and crude oil. Derindere Köseoğlu et al. (2023) identify causality between the Russia–Ukraine War and the Moscow Exchange index, utilising a forecasting approach to estimate the counterfactual market response. The findings indicate that the War in Ukraine negatively affects the index, with more significant effects observed at the onset of the conflict.

After the Russia–Ukraine war started, studies were released to ascertain the effects of the fighting on the international financial market (Boubaker et al., 2022; Lo et al., 2022; Sun et al., 2022). Before the conflict broke out, investors faced several difficulties, including the restart of the global economy following COVID-19, concerns about emerging viral types, skyrocketing inflation and the redesigned central banking and monetary systems. The review discloses that the geopolitical conditions in the chosen nations, particularly the reliance on Russian energy supplies and trade connections with China, have a major impact on equity markets, with regulatory climate risks, in particular, playing a big effect (Deng et al., 2022). Federle et al. (2022) analysed that within the first several weeks of the battle, markets in those nations that are

geographically intimate to the fighting suffer a significant proximity penalty and negative returns. In areas with a high risk of disaster and a declining stock market, the war had a detrimental impression on the market. The results demonstrate that the proximity penalty is similarly visible when employing a series of straightforward ordinary least square regressions. Tosun and Eshraghi (2022) compared the behaviour of firms classified as remainers and leavers during times of war and corporate decision-making. Despite sanctions and public calls to cease business activities in the Russian market, some firms continue their operations. The findings also indicate that investors impose a substantial market penalty on remainers, resulting in negative sentiment towards companies that maintain business ties.

Aggarwal et al. (2023) and Saini and Mahender (2023) from several countries have attempted to closely examine how the war between Russia and Ukraine affected the economies of those nations. The ramifications of the Ukraine–Russia conflict on European company valuation are discussed by Bougias et al. (2022), and this analysis reveals that companies with significant income linked to the Russian economy are more likely to encounter credit spreads, higher asset volatility and default risks. The authors reveal that the economy will be severely affected if the war lasts longer. Barchielli et al. (2022) mention conflicts, COVID-19, resource exhaustion and climate shift as the world's most significant challenges these days, and these challenges have a detrimental control on psychological well-being and the financial market.

Even though numerous studies have attempted to demonstrate the consequences of the fight between Russia–Ukraine in various aspects, based on the author's current level of knowledge and understanding, no study has advanced to inspect the impression of the fight based on volatility context on the share markets of South Asian nations. Therefore, understanding this research gap, this study aims to explore the consequences of the Russia–Ukraine war on the stock markets of South Asian nations, as previous studies have overlooked this aspect and the specific effects of global events on equity market returns and volatility.

3   Data and methodology

This study applies a quantitative statistical approach to determine the impact of Russia–Ukraine war on the stock market of some selected South-Asian countries. This research advances through a sequence of steps.

3.1   Estimation strategy

Initially, we employed unit root testing in this study to determine whether our data set is stationary. Stationarity is a fundamental concept in time series analysis because many statistical methods and models assume that the results are not validated if the data is not stationary. Non-stationary data can lead to spurious regression results and incorrect conclusions. Thus, unit root tests are a prerequisite for developing and estimating any time series model. Besides, it informs researchers about the underlying data properties, which are essential for choosing appropriate forecasting models, estimating parameters and drawing meaningful conclusions from their research. In this context, data stationarity is confirmed using two well-known unit root screening techniques: the Augmented Dickey-Fuller and Phillips-Perron tests. The results of both tests are then compared to verify the integration phase. In the second stage, to detect

volatility, the Autoregressive Conditional Heteroskedasticity-Lagrange Multiplier test (ARCH-LM) developed by Engle (1982) is used. In time series data, this test is applied to examine heteroscedasticity's presence; thus, the Generalised Autoregressive Conditional Heteroskedasticity (GARCH) effect is determined if the ARCH effect is confirmed. In the third step, the GARCH-In-Mean model is employed to capture the impact of the Russia–Ukraine war on stock market volatility, particularly in financial markets. By accounting for the impact of changing volatility, it provides a more realistic representation of asset behaviour and improves predictive accuracy. This model is crucial for risk management and decision-making, helping investors and businesses make informed choices based on the interplay between risk and reward. However, several diagnostic tests are incorporated in the fourth phase to confirm and verify the results.

3.2 Data collection

This study is conducted using daily pricing data from the website of investing.com and merolagani.com. The stock indices of our current field of study are DSEX (Bangladesh), Nifty 500 (India), KSE 100 (Pakistan), CSE All-Share (Sri Lanka) and NEPSE (Nepal), and the time frame is from August 2014 to November 2022. This includes the pre-war time frame (August 2014 to February 2022) and the post-war time frame (March 2022 to November 2022). This study uses equation (1) to determine the market return, followed by Golder et al. (2022).

$$R_{m,n} = \text{In}\left(\frac{P_{m,n}}{P_{m,n-1}}\right) \tag{1}$$

Here, daily return on index m at period n is $R_{m,n}$. The close-down value of the index m for the day n is $P_{m,n}$, and $P_{m,n-1}$ is the daily closing price of index m at period n–1.

3.3 Model estimation

The mean return and volatility must be assessed to know the impact of the Russia–Ukraine conflict on the equity market. We have used the GARCH in-mean model, and the use of this model is supported by its capacity to represent both the time-varying volatility and its possible effect on stock returns. Generally, the ARCH model and its extensions (e.g., GARCH) are used to model and forecast financial and economic time series data volatility. Estimating the ARCH effect helps researchers understand how the conditional variance of a series changes over time. This is critical in financial risk management, where accurate volatility forecasts are essential for portfolio optimisation and risk assessment. It helps capture the time-varying nature of volatility and avoids the assumption of constant variance, which is often unrealistic in many real-world applications. Researchers can compare different ARCH models and identify the best-fitting model based on the Akaike Information Criterion (AIC) or Bayesian Information Criterion (BIC). This aids in model selection and improves the quality of empirical research. This model is helpful in our study regarding the impact of the Russia–Ukraine war on stock markets in South Asia since it considers both volatility dynamics and the potential implications of volatility changes on mean or average returns. This comprehensive approach facilitates a more profound comprehension of the correlation between geopolitical events and stock market performance, offering valuable insights into the lessons that South Asian nations and investors operating in these markets have to learn.

The GARCH-in-mean model with the additional variable of the war dummy is presented below, where equation (2) is the conditional mean equation, and equation (3) represents the conditional volatility equation.

$$R_{m,n} = \Psi + \gamma_1 \sigma_{m,n}^2 + \vartheta_1 R_{m,n-1} + \theta_1 war_{n(dummy)} + \varepsilon_{m,n} \tag{1}$$

$$\sigma_{m,n} = \Omega + \varphi_1 \sigma_{m,n-1} + \tau_1 \varepsilon_{n-1}^2 + p_1 war_{n(dummy)} \tag{2}$$

Here, dummy = 0 when there is no conflict (August 2014 to February 2022) and dummy = 1, when there is war (March 2022 to November 2022).

In equation (2), $R_{m,n}$ and $\varepsilon_{m,n}$ represent the return and disturbance terms of stock m at time n, respectively. Besides, Ψ specifies the constant. $R_{m,n-1}$ is the previous day's return of stock index m at time n-1 and $war_{n(dummy)}$ is a dummy variable for war at the period n. $\sigma_{m,n}^2$ represents the conditional variance and γ_1 is the coefficient of volatility in conditional mean equation. The coefficients ϑ_1 and θ_1 specify the impact of $R_{m,n-1}$ and War_n, respectively.

In equation (3), $\sigma_{m,n}$ denotes standard deviation and Ω represents the intercept term. φ_1, τ_1 and p_1 are parameters of ARCH, GARCH and a dummy variable for the Russia–Ukraine war. τ_1 and φ_1 are positive parameters expressing the ARCH and GARCH effects, respectively. A larger ARCH term indicates a more extended period before the change dissipates, while a larger value for the GARCH term indicates greater responsiveness to new data. However, higher volatility is characterised by a value of $(\tau_1 + \varphi_1)$ close to 1 (Chaudhary et al., 2020; Rastogi, 2014). A positive and statistically substantial coefficient for the conflict in the conditional volatility equation indicates that the war is connected with increased market volatility. Regrettably, a correlation between the conflict and reduced market volatility may exist when the conflict's coefficient is negative and statistically significant.

4   Results and findings

Table 1 reports the summary statistics of the study, where the mean returns for all indices were positive during the full sample period, whereas, during the war period, all indices experienced negative mean returns except for the Nifty 500. In the pre-war phase, the mean returns of all indices exhibit significantly positive outcomes. Therefore, the DSEX, Nifty 500, KSE 100, CSE All-Share and NEPSE indices demonstrate positive mean results in two distinct periods, suggesting a robust positive market response over the pre-war phase and for the entire sample period. In both the full sample period and the pre-war period, the median values of the NEPSE index indicate a negative outcome, while all other indices demonstrate a positive result. Among all the indices during the entire sample period, the DSEX has the most considerable maximum value compared to the KSE 100 and CSE All-Share but a lesser value than the NEPSE and Nifty 500. The NEPSE has a lower mean value than the Nifty 500. During the conflict, indices' minimum values range from –0.084449 (CSE All-Share) to –0.027817 (DSEX), and the standard deviation ranges from 0.022672 (CSE All Share) to 0.008501 (DSEX). Nifty

500, CSE All-Share and KSE 100 have a negative skewness, while DSEX and NEPSE have positive skewness during pre-war, war-time and mixed periods. During the entire sample and pre-war period, the Nifty 500 has more considerable kurtosis results than the rest of the indices. However, KSE100 has larger kurtosis results than the rest of the indices in war-time.

Table 1   Descriptive statistics

Particulars	DSEX	Nifty 500	KSE100	CSE All-Share	NEPSE
	(A) Entire sample period (August 2014 – November 2022)				
Mean	0.000179	0.000454	0.000173	0.000119	0.000330
Median	0.000329	0.001253	0.000310	0.000000	–0.000376
Max.	0.097984	0.355217	0.046840	0.065900	0.058846
Min.	–0.067371	–0.350783	–0.071024	–0.084449	–0.062262
S.D.	0.008352	0.015521	0.010835	0.010437	0.013463
Skew.	0.681267	–0.387771	–0.609518	–0.995811	0.277150
Kurto.	17.97297	268.8487	7.408084	15.29108	5.956107
JB	18309.75	5986859	1778.838	12558.02	704.4433
Prob.	0.000000	0.000000	0.000000	0.000000	0.000000
Obs.	1944	2033	2041	1944	1869
	(B) Pre-War period (August 2014 to February 2022)				
Mean	0.000244	0.000458	0.000229	0.000277	0.000564
Median	0.000345	0.001279	0.000302	0.000000	–0.000166
Max.	0.097984	0.355217	0.046840	0.049705	0.058846
Min.	–0.067371	–0.350783	–0.071024	–0.079612	–0.062262
S.D.	0.008339	0.015834	0.010858	0.008561	0.013269
Skew.	0.736929	–0.377789	–0.615741	–1.152670	0.230808
Kurto.	19.16666	270.5662	7.596751	16.17339	6.340408
JB	19699.10	5560332	1767.384	13317.09	807.3706
Prob.	0.000000	0.000000	0.000000	0.000000	0.000000
Obs.	1794	1864	1873	1787	1704
	(C) During the war period (March 2022 to November 2022)				
Mean	–0.000598	0.000406	–0.000455	–0.001688	–0.002077
Median	0.0000141	0.000415	0.000584	–0.001274	–0.004665
Max.	0.030218	0.029448	0.037545	0.065900	0.049719
Min.	–0.027817	–0.051722	–0.039762	–0.084449	–0.039414
S.D.	0.008501	0.011543	0.010582	0.022672	0.015160
Skew.	0.065557	–0.600204	–0.547131	–0.294920	0.719378
Kurto.	4.604602	4.886038	5.093779	4.703280	3.771889
JB	16.19962	35.19507	39.06924	21.25435	18.32759
Prob.	0.000000	0.000000	0.000000	0.000000	0.000000
Obs.	150	169	168	157	165

Source: Author's calculation.

Table 2 reports the outcomes of unit root testing and the ARCH-LM test. The stationarity nature of the variables is examined using the ADF and the P.P. unit root test for the return of five indices, namely, the DSEX, Nifty 500, the KSE 100, the CSE All-Share and the NEPSE. The ARCH-LM test is used to determine the existence of heteroskedasticity, a condition in which the variance of the error term of a statistical model is not constant across observations. The ADF and the P.P. unit root test results show that the DSEX, Nifty 500, KSE 100, CSE All-Share and NEPSE are all stationary at the level, indicating that the variance and mean of the return series are unaffected by a change in period.

Table 2   Stationarity and ARCH-LM test

Test	DSEX	Nifty 500	KSE 100	CSE all-share	NEPSE
ADFcL	–15.203***	–58.326***	–39.403***	–14.846***	–22.670***
ADFctL	–15.200***	–58.315***	–39.405***	–14.860***	–22.667***
PPcL	–37.484***	–58.491***	–39.615***	–34.971***	–37.554***
PPctL	–37.474***	–58.484***	–39.608***	–34.951***	–37.544***
ARCH Effect (Obs R-squared)	137.307***	491.828***	67.574***	380.347***	118.937***

Notes: Significance level: ***= 1%, **= 5%, and. *= 10%. cL= constant at I(0), ctL= constant and trend at I(0); Author's calculation.

Table 3 shows the GARCH-in-mean model, where findings are organised into three sections (e.g., Part A, B and C). Part A of Table 3 displays the results of the conditional mean equation (equation (1)), which shows that the GARCH coefficients for the KSE 100 and the CSE All-Share are statistically significant where coefficients of DSEX, Nifty 500 and NEPSE are insignificant. Besides, all the index's historical value (one period lag of return) significantly impacts the outcome, which suggests that the historical performance of an index, particularly its returns from a previous period, has a notable influence on the results or outcomes of a particular analysis, decision or model. In predicting current return values, the historical performance of the CSE All-Share index is more influential than that of the NEPSE, DSEX, KSE 100 and Nifty 500 indexes. This suggests that the Sri Lankan stock market's past performance significantly affects current return predictions, while the other four indexes have comparatively less impact. This insight underscores the importance of considering the CSE All-Share index when making investment decisions in Sri Lanka. The Russia–Ukraine war exerts a detrimental effect on the returns of DSEX, KSE 100 and NEPSE, signalling a broader regional economic concern and potential investor sentiment linked to geopolitical instability, and some reasons might exist behind this. Firstly, the continuing clash between Russia and Ukraine creates global economic uncertainty, making investors cautious and hindering investments in emerging markets like Asia, leading to lower market returns. Secondly, trade disruptions caused by the conflict might harm the economy of Asian countries, which have strong economic ties with Russia and Ukraine, resulting in reduced exports, imports and revenue for companies that contribute to lower stock market returns. Thirdly, the conflict has caused energy price fluctuations, leading to higher energy costs globally, negatively impacting Asian economies and stock market performance, resulting in lower market returns. Fourthly, the conflict might trigger capital outflows from emerging markets like Asia as investors seek safer havens, reducing market returns for Asian countries. Finally, if tensions escalate or the conflict spreads, it can increase instability in

other regions, affecting market returns due to political unrest, security concerns and geopolitical contagion, and this result is consistent with Basdekis et al. (2022), Boungou and Yatie (2022), Brune et al. (2011), Derindere Köseoğlu et al. (2023), Wang et al. (2011) and Yousaf et al. (2022).

In Part B of Table 3, the variance equation (equation (2)) results reveal that the ARCH and GARCH terms, which signify volatility and risk, are positively and statistically significant for all indices. Additionally, the presence of a dummy variable representing the war coefficient shows a significant and positive relationship with the DSEX, CSE All-Share and NEPSE indices. These findings suggest that the indices are affected by heightened volatility, and the occurrence of war or conflict has a discernible impact on the volatility of these particular markets. In contrast to the other indices, the coefficient of the war-related dummy variable for the Nifty 500 is statistically significant and negatively correlated. This suggests that the presence of war has an unusual effect on this particular index by reducing volatility rather than increasing it. These results highlight the unique response of the Nifty 500 to geopolitical events compared to the other indices in the study.

Table 3 GARCH in mean model with the dummy variable of the Russia–Ukraine war

Particulars	*DSEX*	*Nifty 500*	*KSE 100*	*CSE all-share*	*NEPSE*
	Part A: Conditional mean				
γ_1	4.872790 (3.081914)	–0.675547 (2.602310)	6.585149* (3.718026)	4.795975* (2.624366)	3.160567 (2.208836)
Ψ	0.000068 (0.000174)	0.000883 (0.000622)	0.000139 (0.000368)	–0.000299** (0.000136)	0.000227 (0.000342)
ϑ_1	0.193432*** (0.024084)	0.165494*** (0.040326)	0.176009*** (0.024950)	0.253812*** (0.026908)	0.220621*** (0.024883)
θ_1	–0.001031* (0.000530)	0.000403 (0.000893)	–0.001767** (0.000756)	–0.000327 (0.001587)	–0.002290* (0.001233)
	Part B: Conditional volatility				
Ω	0.000003*** (0.000001)	0.000036*** (0.000005)	0.000005*** (0.000001)	0.000002*** (0.0000002)	0.000012*** (0.000001)
τ_1	0.260916*** (0.021139)	0.170274*** (0.028258)	0.146207*** (0.015192)	0.216773*** (0.012419)	0.274044*** (0.024708)
φ_1	0.711683*** (0.021269)	0.706875*** (0.036590)	0.805989*** (0.019134)	0.774887*** (0.012739)	0.670352*** (0.021825)
p_1	0.000004*** (0.000001)	–0.000022*** (0.000004)	0.000003 (0.000002)	0.000012** (0.000005)	0.000016** (0.000008)
	Part C: Model statistics				
$\tau_1 + \varphi_1$	0.973	0.877	0.952	0.992	0.944
Schwarz Criterion	–7.084	–5.853	–6.413	–7.193	–6.057
ARCH-LM Tests (Obs*R^2-Squared)	2.102	0.106	0.477	0.052	1.185

Notes: Significance level: ***= 1%, **= 5%, and. *= 10%. Figures in () denote standard errors; Author's calculation.

The parameters of ARCH and GARCH models are indeed associated with the impact of news or information on stock market volatility. Specifically, the ARCH term, which represents the latest available information, underscores that recent news and facts can substantially influence stock market volatility. This means that market participants react to the most current information, potentially leading to increased volatility as they adjust their expectations and positions in response to new developments, events or news releases. The observation indicates varying levels of sensitivity to news and information across different stock markets. NEPSE exhibits the most pronounced ARCH effect, suggesting it is highly responsive to recent news and information, potentially leading to heightened volatility. DSEX follows closely, indicating a significant response to news but not as pronounced as NEPSE. CSE All-Share and Nifty 500 are in the third and fourth positions, respectively, while KSE 100 displays the least sensitivity to the news among the mentioned stock markets, making it the least news-sensitive in this analysis. These findings reflect the differing degrees of market reactivity to information, which can influence market participants' behaviour and the resulting volatility.

A statistically significant GARCH term signifies that historical data, particularly past volatility and its persistence, can significantly impact market volatility. When the GARCH coefficient is notable, it indicates that the effects of past volatility persist over time, resulting in persistent volatility patterns. This observation reveals the duration it takes for any shocks or changes in market conditions to gradually dissipate and return to a more stable state, shedding light on the dynamic nature of market volatility and its response to historical data. Results show that the KSE 100 has the longest reduction time for conditional variance shocks among the five indices considered, followed by the CSE All-Share, DSEX, Nifty 500 and NEPSE. Based on the findings, the analysis suggests that a shock to the KSE 100 index has the most enduring impact on conditional instability, indicating that disruptions or changes in the KSE 100 have longer-lasting consequences on volatility. Following this, the CSE All-Share, DSEX, Nifty 500 and NEPSE exhibit progressively shorter-term effects, emphasising the varying degrees of persistence in conditional instability among these financial markets. However, the mean-reverting process is indicated if the sum of the value of the ARCH and GARCH terms is less than one. We find that the Nifty 500 has the highest mean-reverting process, whereas CSE All-Share has the slowest mean-reversion capacity. However, in the case of mean reversion capacity, while the Nifty 500 and CSE All-Share are at the extremes of the equity market, the NEPSE, KSE 100 and DSEX can be found halfway in the Middle.

The GARCH-in-mean model, which integrates the war-related dummy variable into the conditional volatility equation, demonstrates that war positively impacts the DSEX, CSE All-Share, and NEPSE indices, indicating that conflicts contribute to market instability. However, it is noteworthy that this impact is relatively minor, suggesting that while wars can lead to increased volatility, the overall effect on these markets is not as substantial as expected. These findings highlight the resilience of these markets to geopolitical events and the intricate interplay of various factors in determining market stability.

The influence of the war's effects has made the CSE All-Share the second most volatile market, following closely behind the NEPSE, indicating that both markets experience elevated levels of volatility due to geopolitical events. This suggests that the uncertainty and disruptions caused by the war significantly impact the CSE All-Share, making it one of the more turbulent markets in this context. However, the DSEX is less influenced by the Russia–Ukraine war. The Russia–Ukraine War might heighten the

volatility of stock markets due to various factors. Initially, the conflict generates uncertainty in the global economy, prompting investors to exercise caution and resulting in market fluctuations. Additionally, trade disruptions stemming from the war might impact the stock market, leading to decreased trade volumes and revenue for businesses, thereby affecting market stability and similar findings were reported by Beraich et al. (2022), Bougias et al. (2022) and Federle et al. (2022). We also find that the war has a significant disadvantageous consequence on the Nifty 500. Investors might shift their wealth away from more volatile markets and toward what they believe to be safer options. India might be able to draw some of this capital due to its expanding market and reasonably stable economy, which would benefit the stock market.

The results of the diagnostic tests performed on this GARCH-in-mean model are displayed in Table 3 (Section C), where it is seen that no ARCH impact exists for any of the indices.

5 Conclusion and policy implications

This empirical study aims to examine the effect of the conflict between Russia and Ukraine on the performance of stock indices in five selected Asian countries, namely Bangladesh, India, Pakistan, Sri Lanka and Nepal, that consider daily stock market returns starting from September 2014 to August 2022. The daily returns of the DSEX, Nifty 500, KSE 100, NEPSE and CSE All-Share are used with the GARCH-in-mean model with a dummy variable. According to the findings, the volatility and returns of the DSEX and NEPSE stock indices are significantly influenced by the clash between Russia and Ukraine. However, the war also affects the volatility of the Nifty 500 and CSE All share index but has no impact on its return. Besides, in KSE 100, the conflict impacts return only, not volatility.

This study is crucial to the investment decisions of both investors and speculators. Investors are reluctant to invest in the stock market due to increased volatility and decreased market returns. To get rid of these situations, we recommend some policies to eliminate the negative influence of the Russia–Ukraine war on the stock markets. Firstly, policymakers should prioritise managing risks by promoting diversification of investment portfolios and effectively handling geopolitical risks to minimise stock market volatility and potential losses. Secondly, policymakers should strengthen market surveillance and regulations to ensure transparent and fair trading practices, focusing on preventing market manipulation and insider trading to maintain market integrity. Thirdly, during heightened volatility, governments and related parties can consider implementing measures for economic stimulus and stability, such as providing liquidity support to financial institutions, lowering interest rates and implementing fiscal stimulus programs to boost investor confidence and stabilise financial markets. Fourthly, policymakers need to prioritise geopolitical risk assessment and contingency planning. It involves conducting comprehensive analyses, stress testing and scenario planning to understand better and manage potential disruptions from conflicts like the Russia–Ukraine war. Finally, the related parties, with the cooperation of international organisations, should emphasise international cooperation and diplomatic efforts to de-escalate disputes and reduce geopolitical tensions. However, it is tough to implement the policies because of some complexities, such as political and institutional barriers, limited control over geopolitical events, cross-border interconnectedness, economic vulnerabilities,

unpredictable situations and unplanned decisions by investors. First of all, implementing steps to mitigate the influence of geopolitical events on the stock market can be challenging due to the inherently unpredictable nature of such events. The effectiveness of strategies like diversification and hedging may vary depending on the severity and duration of the conflict or crisis. Secondly, the limitations of staying informed become apparent when considering the constant flow of information, which can sometimes be overwhelming. Investors may struggle to differentiate between relevant news and noise, potentially leading to misguided decisions. Thirdly, the costs associated with hedging, including options premiums and management fees for specific financial instruments, can erode potential gains and affect the overall returns of an investment portfolio. Fourthly, maintaining a long-term investment perspective may not suit everyone, especially those with short-term financial goals or requiring liquidity in the near term. Finally, it's essential to recognise that unexpected developments often accompany geopolitical events, and no strategy can guarantee absolute protection from market volatility. In this case, the investors should keep patience, observe the situation and make decisions by analysing the overall market. Investors should carefully consider their circumstances and seek professional advice to make well-informed investment decisions in an ever-changing global landscape. Moreover, to overcome this situation, it is necessary to educate investors on uncertain events, and continuous research is mandatory. Moreover, cross-border collaboration, transparency and government intervention might somewhat reduce the problem. Side by side, communication amid global crises to deliver timely information and direction amongst investors, market players and regulatory bodies is also crucial to resolve the issue.

Researchers can think about broadening the scope of this study to include a larger number of South Asian nations to provide a more thorough regional analysis. To further improve the depth of research, examining the long-term consequences of the Russia–Ukraine war on these markets and the implications on economic indicators, investor behaviour, government policies, sectoral variances and cross-border market integration would be beneficial. Evaluating South Asian financial markets' resilience to geopolitical events and how they react to them in ways other than stock market volatility may be a fascinating area for future research. Moreover, future research should carefully consider the latent properties of macroeconomic variables to advance the field's knowledge and expand the study based on Asian countries. It could uncover regional variations, highlight unique market dynamics and enhance our understanding of the global implications of geopolitical conflicts on stock markets.

References

Aggarwal, V., Sharma, S., Kumar, P., Mohnot, J. and Yadav, M. (2023) 'Lessons from the Russia-Ukraine war: portfolio optimization in cryptos and stocks for investors in Ghana', *International Journal of Diplomacy and Economy*, Vol. 9, No. 2, pp.160–175. Doi: 10.1504/IJDIPE.2023.134635.

Ahmed, K. (2022) *Pakistan's stocks down by 1,302 points as Russia launches attack on Ukraine.* Available online at: https://arab.news/86gcz (accessed on 7 June 2022).

Alam, M.K., Tabash, M.I., Billah, M., Kumar, S. and Anagreh, S. (2022) 'The impacts of the Russia–Ukraine invasion on global markets and commodities: a dynamic connectedness among G7 and BRIC markets', *Journal of Risk and Financial Management*, Vol. 15, No. 8. Doi: 10.3390/jrfm15080352.

Barchielli, B., Cricenti, C., Gallè, F., Sabella, E.A., Liguori, F., Da Molin, G., Liguori, G., Orsi, G.B., Giannini, A.M., Ferracuti, S. and Napoli, C. (2022) 'Climate changes, natural resources depletion, COVID-19 pandemic, and Russian-Ukrainian war: what is the impact on habits change and mental health?', *International Journal of Environmental Research and Public Health*, Vol. 19, No. 19. Doi: 10.3390/ijerph191911929.

Basdekis, C., Christopoulos, A., Katsampoxakis, I. and Nastas, V. (2022) 'The impact of the Ukrainian war on stock and energy markets: a wavelet coherence analysis', *Energies*, Vol. 15, No. 21, pp.1–15. Doi: 10.3390/en15218174.

Ben Hassen, T. and El Bilali, H. (2022) 'Impacts of the Russia-Ukraine war on global food security: towards more sustainable and resilient food systems?', *Foods (Basel, Switzerland)*, Vol. 11, No. 15. Doi: 10.3390/foods11152301.

Beraich, M., Amzile, K., Laamire, J., Zirari, O. and Fadali, M. A. (2022) 'Volatility spillover effects of the U.S., European and Chinese financial markets in the context of the Russia-Ukraine conflict', *International Journal of Financial Studies*, Vol. 10, No. 4, pp.1–18. Doi: 10.3390/ijfs10040095.

Boubaker, S., Goodell, J.W., Pandey, D.K. and Kumari, V. (2022) 'Heterogeneous impacts of wars on global equity markets: evidence from the invasion of Ukraine', *Finance Research Letters*, Vol 48. Doi: 10.1016/j.frl.2022.102934.

Bougias, A., Episcopos, A. and Leledakis, G.N. (2022) 'Valuation of European firms during the Russia-Ukraine war *Economics Letters*, Vol. 218. Doi: 10.1016/j.econlet.2022.110750.

Boungou, W. and Yatie, A. (2022) *The Impact of the Ukraine-Russia War on World Stock Market Returns*. Bordeaux Economics Working Papers. Available online at: https://ideas.repec.org//p/grt/bdxewp/2022-06.html.

Brune, A., Hens, T., Rieger, M.O. and Wang, M. (2011) *The War Puzzle: Contradictory Effects of International Conflicts on Stock Markets*, (SSRN Scholarly Paper 1855895). Doi: 10.2139/ssrn.1855895.

Caballero, S. and Arbiol, I. (2022) 'COVID-19 impacts on multilateralism and diplomacy: the potential of business diplomacy', *International Journal of Diplomacy and Economy*, Vol. 8, No. 1. Doi: 10.1504/IJDIPE.2022.125220.

Chaudhary, R., Bakhshi, P. and Gupta, H. (2020) 'Volatility in international stock markets: an empirical study during COVID-19', *Journal of Risk and Financial Management*, Vol. 13, No. 9. Doi: 10.3390/jrfm13090208.

Cohen, S. (2022) 'Is the bowl bare? – The cost of under-development', *The Journal of North African Studies*, Vol. 27, No. 3, pp.433–440. Doi: 10.1080/13629387.2022.2066774.

Deng, M., Leippold, M., Wagner, A.F. and Wang, Q. (2022) *Stock Prices and the Russia-Ukraine War: Sanctions, Energy and ESG*, Swiss Finance Institute Research Paper Series. Available online at: https://ideas.repec.org//p/chf/rpseri/rp2229.html

Derindere Köseoğlu, S., Mercangöz, B.A., Khan, K. and Sarwar, S. (2023) 'The impact of the Russian-Ukraine war on the stock market: a causal analysis', *Applied Economics* pp.1–11. Doi: 10.1080/00036846.2023.2188168.

Engle, R.F. (1982) 'Autoregressive conditional heteroscedasticity with estimates of the variance of United Kingdom inflation', *Econometrica*, Vol. 50, No. 4, pp.9871007. https://doi.org/10.2307/1912773

Federle, J., Meier, A. and Sehn, V. (2022) *Proximity to War: The stock market response to the Russian invasion of Ukraine*, *CEPR Discussion Papers*. https://ideas.repec.org//p/cpr/ceprdp/17185.html.

Golder, U., Rumaly, N., Shahriar, A.H.M., Alam, M.J., Biswas, A.A. and Islam, M.N. (2022) 'The impact of COVID-19 on the volatility of bangladeshi stock market: evidence from GJR-GARCH model', *The Journal of Asian Finance, Economics and Business*, Vol. 9, No. 4, pp.29–38. Doi: 10.13106/jafeb.2022.vol9.no4.0029.

Hoffmann, M. and Neuenkirch, M. (2017) 'The pro-Russian conflict and its impact on stock returns in Russia and the Ukraine', *International Economics and Economic Policy*, Vol. 14, No. 1, pp.61–73. Doi: 10.1007/s10368-015-0321-3.

Izzeldin, M., Muradoğlu, Y.G., Pappas, V., Petropoulou, A. and Sivaprasad, S. (2023) 'The impact of the Russian-Ukrainian war on global financial markets', *International Review of Financial Analysis*, Vol. 87. Doi: 10.1016/j.irfa.2023.102598.

Jagtap, S., Trollman, H., Trollman, F., Garcia-Garcia, G., Parra-López, C., Duong, L., Martindale, W., Munekata, P.E.S., Lorenzo, J.M., Hdaifeh, A., Hassoun, A., Salonitis, K. and Afy-Shararah, M. (2022) 'The Russia-Ukraine conflict: its implications for the global food supply chains', *Foods*, Vol. 11, No. 14. Doi: 10.3390/foods11142098.

Jayakody, S.G. (2017) 'The impact of the Sri Lankan Civil War on the stock market performances', *International Journal of Economics and Financial Issues*, Vol. 7, No. 1, pp.394–402.

Kamal, M.R., Ahmed, S. and Hasan, M.M. (2023) 'The impact of the Russia-Ukraine crisis on the stock market: evidence from Australia', *Pacific-Basin Finance Journal*, Vol. 79. Doi: 10.1016/j.pacfin.2023.102036.

Le, V.H., Von Mettenheim, H-J., Goutte, S. and Liu, F. (2022) 'News-based sentiment: can it explain market performance before and after the Russia–Ukraine conflict?', *The Journal of Risk Finance*. Doi: 10.1108/JRF-06-2022-0168.

Lo, G-D., Marcelin, I., Bassène, T. and Sène, B. (2022) 'The Russo-Ukrainian war and financial markets: the role of dependence on Russian commodities', *Finance Research Letters*, Vol. 50. Doi: 10.1016/j.frl.2022.103194.

Mudgill, A. and Raj, S. (2022) *Russian Invasion Sparks Biggest Sensex Crash in 2 Years; Investors Lose Rs 13.6 Lakh Crore*, The Economic Times. Available online at: https://economictimes.indiatimes.com/markets/stocks/news/sensex-crashes-over-1300-points-as-russia-orders-military-action-inukraine/articleshow/89789291.cms? (accessed on 31 November 2022).

Nasir, M.A., Nugroho, A.D. and Lakner, Z. (2022) 'Impact of the Russian-Ukrainian conflict on global food crops', *Foods*, Vol. 11, No. 19. Doi: 10.3390/foods11192979.

Nerlinger, M. and Utz, S. (2022) 'The impact of the Russia-Ukraine conflict on energy firms: a capital market perspective', *Finance Research Letters*, Vol. 50. Doi: 10.1016/j.frl.2022.103243.

Nivorozhkin, E. and Castagneto-Gissey, G. (2016) 'Russia/n stock market in the aftermath of the Ukrainian crisis', *Russian Journal of Economics*, Vol. 2, No. 1, pp.23–40. Doi: 10.1016/j.ruje.2016.04.002.

Orhan, E. (2022) 'The effects of the Russia-Ukraine war on global trade', *Journal of International Trade, Logistics and Law*, Vol. 8, No. 1, pp.141–146.

Prohorovs, A. (2022) 'Russia's war in Ukraine: consequences for European countries' businesses and economies', *Journal of Risk and Financial Management*, Vol. 15, No. 7. Doi: 10.3390/jrfm15070295.

Rahman, M. (2022) *Stock market suffers dismal performance in 2022.* Available online at: https://www.newagebd.net/article/190459/stock-market-suffers-dismal-performance-in-2022 (accessed on 6 January 2023).

Rastogi, S. (2014) 'The financial crisis of 2008 and stock market volatility – analysis and impact on emerging economies pre and post crisis', *Afro-Asian Journal of Finance and Accounting*, Vol. 4, No. 4, pp.443–459. Doi: 10.1504/AAJFA.2014.067017.

Reuters (2022) *Sri Lanka Shares Plunge 5% as Economic Crisis Worsens*, Russia invades Ukraine. Available online at: https://www.reuters.com/markets/stocks/sri-lanka-shares-plunge-5-economic-crisis-worsens-russia-invades-ukraine-2022-02-24 (accessed on 26 November 2022).

Saini, M. and Mahender, N.A. (2023) 'Surviving crisis: the role of sustainable investments in navigating the impact of the Russia-Ukraine war', *International Journal of Diplomacy and Economy*, Vol. 9, No. 2, pp.189–204. Doi: 10.1504/IJDIPE.2023.134637.

Saini, M., Yadav, M., Aggarwal, V. and Kumar, M. (2023) 'All weather friends: how did the Russia-Ukraine war impact Indian stock markets?', *International Journal of Diplomacy and Economy,* Vol. 9, No. 1, pp.93–111. Doi: 10.1504/IJDIPE.2023.128806.

Sun, M., Song, H. and Zhang, C. (2022) *The Effects of 2022 Russian Invasion of Ukraine on Global Stock Markets: An Event Study Approach*, (SSRN Scholarly Paper 4051987). Doi: 10.2139/ssrn.4051987.

Tosun, O. K. and Eshraghi, A. (2022) 'Corporate decisions in times of war: evidence from the Russia-Ukraine conflict', *Finance Research Letters*, Vol. 48. Doi: 10.1016/j.frl.2022.102920.

Umar, Z., Polat, O., Choi, S-Y. and Teplova, T. (2022) 'The impact of the Russia-Ukraine conflict on the connectedness of financial markets', *Finance Research Letters*, Vol. 48. Doi: 10.1016/j.frl.2022.102976.

Wang, X., Wang, X., Zhong, Z. and Yao, J. (2021) 'The impact of US–China trade war on Chinese firms: evidence from stock market reactions', *Applied Economics Letters*, Vol. 28, No.7, pp.579–583. Doi: 10.1080/13504851.2020.1764477.

Yousaf, I., Patel, R. and Yarovaya, L. (2022) 'The reaction of G20+ stock markets to the Russia-Ukraine conflict 'black-swan' event: evidence from event study approach', *Journal of Behavioral and Experimental Finance*, Vol. 35. Doi: 10.1016/j.jbef.2022.100723.