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The effect of the Russian-Ukrainian Conflict on the main frontier Markets: An Event Study Approach

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Abstract: It is generally acknowledged that geopolitical events have a substantial effect on the different aspects of the global economy, especially financial markets. Considering the extent of the impacts caused by the Russo-Ukrainian conflict in 2022 and the lack of studies on its effect on frontier markets, our research aims to study the effect of the outbreak of the conflict between Russia and Ukraine on frontier stock markets. Our study employs an event study approach on the daily returns of the benchmarks of the main frontier markets, namely Vietnam, Morocco, Island, Kazakhstan, and Romania. The results of our research show that the main studied frontier markets reacted negatively to the Russo-Ukrainian conflict, and the shock did not subside even during later periods.

Mots-clés: *Russian-Ukrainian conflict, Frontier markets, Event study approach.*

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1. Introduction

The current level of development of the financial markets could be one of the catalysts for the development of the world's economies, based on its role in allocating financial resources to investment projects on all productive axes. Mainly, financial markets, and more precisely stock markets, are not stable, but they are characterized by a dynamic that involves moments of the rise and others of fall resulting from changes in the perception of the various market actors, which can be influenced in turn by various; economic, political, internal and external factors due to the progressive movement of liberalization of financial markets.

Recently, the economic and political news has experienced an acceleration of great magnitude related to the repercussions of the health pandemic (Covid-19), however, which has led to the domination of a new world event of geopolitical nature; the Russo-Ukrainian conflict in 2022. The latter, in just a few days, further fueled global inflation, raising the price of oil, natural gas, and other necessities (Cohen & Ewing, 2022).

In this context, the topic of the effect of the Russo-Ukrainian crisis on financial markets is still recent, and few studies have focused on this issue (Ahmed et al., 2022; Mojanoski, 2022.; Sun et al., 2022; Yousaf et al., 2022).

Overall, financial markets can be classified into three categories: developed markets, emerging markets, and frontier markets. Although frontier markets are less developed, riskier, and less accessible than developed and emerging markets, they still represent a diversification option for international investors. Despite this, we have identified an obvious gap in the existing literature, which is that these studies have focused on the shock of the Russo-Ukrainian conflict exclusively from the perspective of developed and emerging financial markets. To fill this gap, we believe it is necessary to study the reaction of frontier financial markets to this new news event for several reasons;

On the one hand, our study will contribute to the existing literature on the reaction of stock markets to war events. We will also examine the perception of market participants to this type of conflict using a combination of parametric and non-parametric tests. These tests will take into account the characteristics of the financial series without assuming any probability distribution for the data. On the other hand, despite their high level of risk due to significant weaknesses in liquidity and market capitalization, frontier markets have significant growth potential compared to their counterparts. Therefore, studying their reaction to the Russia-Ukraine conflict is of major interest.

For this reason, our objective through this study is to analyze the reaction of the main frontier stock markets to the Russo-Ukrainian conflict, through the mobilization of the event study approach. Therefore, we need to answer the following central question: To what extent did the Russo-Ukrainian conflict exert an effect on the returns of the main frontier stock markets?

In order to answer our central question, our research will be treated according to the following plan; Section 2 the literature review, section 3 the data and methodology, section 4 the presentation and discussion of the results, and section 5 conclude the paper.

2. Literature review

2.1. The Economic Effects of War: Theoretical Framework

Existing studies on the economic effects of war show that wars have real economic consequences. Indeed, Kang & Meernik (2005) have shown that there are two major intellectual schools on the effects of war. The first current is that of "war renewal", while the second is that of "war ruin".

According to the “war renewal” movement, wars can have positive effects on the economy by reducing the influence of private interests and fostering the emergence of more dynamic and skilled coalitions. For instance, the establishment of a new government that prioritizes innovation and human capital development can boost the prospects for economic growth (Olson, 1982).

In contrast, the "war ruin" movement considers wars as destructive events without any economic benefits. Wars destroy infrastructure, and human life, and reduce the confidence of local and international investors, thereby potentially exposing to risk the long-term economic stability of the concerned country. As Collier (1999) suggests, such disruptions could result in the transfer of financial and economic resources to more stable neighboring states, and even negatively impact economic growth in neighboring countries due to uncertainty and loss of confidence (Murdoch & Sandler, 2002).

2.2. Financial market reaction to the Russo-Ukrainian conflict: Lessons from the empirical literature

The intensity of the crisis between Russia and Ukraine amplified when Russia recognized Donetsk and Lugansk as independent states. Especially when Russian troops were

deployed as peacekeepers in those regions. This recent crisis has prompted numerous empirical studies, but only a few have examined the effect of the crisis on financial markets, specifically, the reaction of stock markets to the conflict between Russia and Ukraine. Most of these studies rely on the event study, which has undergone some technical advancements over time. Furthermore, its principle remains unchanged since Fama et al.'s (1969) methodology of testing informational efficiency in its semi-strong version.

Yousaf et al. (2022) examined the effect of the outbreak of the Russia-Ukraine conflict on the G20 countries using the event study approach. Their analysis of abnormal returns (AR), both before and after the start of the special military operation by Russian forces on February 24, 2022, revealed that this military operation had a substantial adverse effect on most studied stock markets, especially the Russian stock market. By posting negative abnormal returns several days before the Russian military action in Ukraine, the stock markets of Hungary, Poland, Russia, and Slovakia were the first to react to the crisis, according to the study's findings. However, the same reaction was recorded in the days that followed by the stock markets of Australia, France, Germany, India, Italy, Japan, Romania, South Africa, Spain, and Turkey.

The study by Mojanoski (2022) is interested in examining the reaction of the stock markets of Southeast Europe to the warlike intervention of Russia in Ukraine, whose results have shown that the stock markets of the countries examined have dropped significantly at the start of the war intervention. Sun et al. (2022) using the same event study methodology, documented that war has differential effects on stock markets between the countries studied, depending on the depth of their involvement or sectors in the war. The main result of their study is that companies located in countries far from the battlefield do not seem to be significantly affected compared to other countries closer to the battlefield. Finally, Ahmed et al. (2022) found that European stock markets have recorded significant negative returns. In addition, negative reactions continued in the period that followed the event.

3. Data and methodology

3.1. Data

This study mobilizes data covering the period from 04 January 2021 to 31 March 2022, our database which is composed of the closing prices of the benchmark stock indices of the main frontier markets according to the Morgan Stanley Capital International (MSCI) classification in 2022, including the MSCI Frontier Markets Index which captures market returns, as it is a presentation of large and mid-caps in 28 frontier market countries in total.

We selected five countries (table 1) : Vietnam, Morocco, Iceland, Kazakhstan, and Romania for this study because of their significant weight in the MSCI Frontier Markets index, as well as their economic importance and potential for future growth. Specifically, the total weight of these five countries in the MSCI Frontier Markets index is 63,77%, which justifies their inclusion in our database.

The closing prices of these indices were used to calculate the daily log returns for each index based on the following formula :

$$R_t = ln\left(\frac{C_t}{C_{t-1}}\right).100$$

Where; R_t is the daily logarithmic return of the index at date t, while C_t and C_{t-1} are the closing price of the index concerned on day t and t-1 respectively.

Table 1: Collected data

Country	*Weight in the MSCI FM index*	*Index*	Code of the index returns
Vietnam	30,30%	VNI	*RVNI*
Morocco	9,61%	MASI	*RMASI*
Island	8,86%	ICEX	*RICEX*
Kazakhstan	8,38%	KASE	*RKASE*
Romania	6,62%	BETI	*RBETI*
Index of Frontier markets		MSCI FM Index	*RMSCI_FM*

Source: Investing.com

3.2. Hypotheses

Starting from the post-positivist epistemological position, with hypothetico-deductive reasoning, the objective of this study is to analyze the reaction of the main frontier financial markets to the conflict between Russia and Ukraine in 2022.

Therefore, our research consists of testing the following hypotheses:

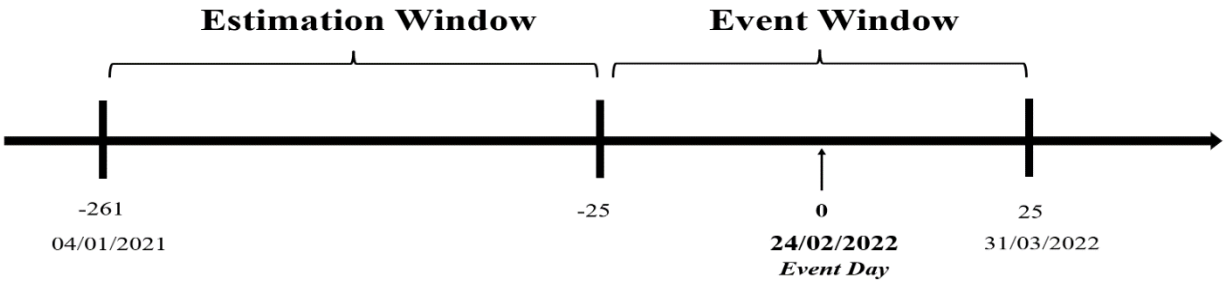
- H0: The official announcement of the Russian-Ukrainian conflict did not affect the main frontier financial markets;
- H1: The main frontier financial markets reacted significantly to the Russo-Ukrainian conflict;
  - H1a: The Russo-Ukrainian conflict has negatively affected the main frontier financial markets;
  - H1b: The Russo-Ukrainian conflict has positively affected the main frontier financial markets.

3.3. Methodology

The event study methodology, as applied by Fama (1991), is based on the efficient market hypothesis. This technique allows the analysis of the effect of events on financial asset prices, by studying the price changes that follow the arrival of good or bad news (ÖZTÜRK & ÇEKİÇ, 2021).

It is important to note that event studies do not necessarily limit their analysis to the reaction of financial markets to financial announcements, such as earnings reports and dividend declarations. Instead, they can be applied to any significant event that may impact the financial markets, including non-financial events. However, in the current study, our focus is on the effect of a geopolitical event, namely the Russo-Ukrainian conflict, on the main frontier stock markets.

Figure 1: Implementation of the event study



Source: Authors

Using the market model as the process of generating return (Sharpe, 1963), the expected or theoretical returns can be calculated as follows;

$$\boldsymbol{E(R_t)^{theorical} = \hat{\alpha} + \hat{\beta} R_{mt}}$$

With; R_t the return at time t, and R_{mt} the market return at time t, $\hat{\alpha}$ and $\hat{\beta}$ parameters to be estimated by the ordinary least squares (OLS) method.

The abnormal returns (AR), assumed to be normally distributed (Campbell & Wasley, 1996), are calculated as follows :

$$\boldsymbol{AR_t = R_t - E(R_t)^{theorical}}$$

$$\boldsymbol{\Longrightarrow AR_t = R_t - (\hat{\alpha} + \hat{\beta} R_{mt})}$$

Cumulative abnormal returns (CAR) can be derived from the abnormal returns according to the formula below:

$$\boldsymbol{CAR(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_t}$$

To take into account the main characteristics of financial series (Omerani et al., 2022), by testing the significance of the abnormal returns and cumulative abnormal returns, we will use the parametric; Student's t-test, and the non-parametric; Wilcoxon signed-rank test to remedy the failure of the implicit assumptions, particularly concerning non-normality.

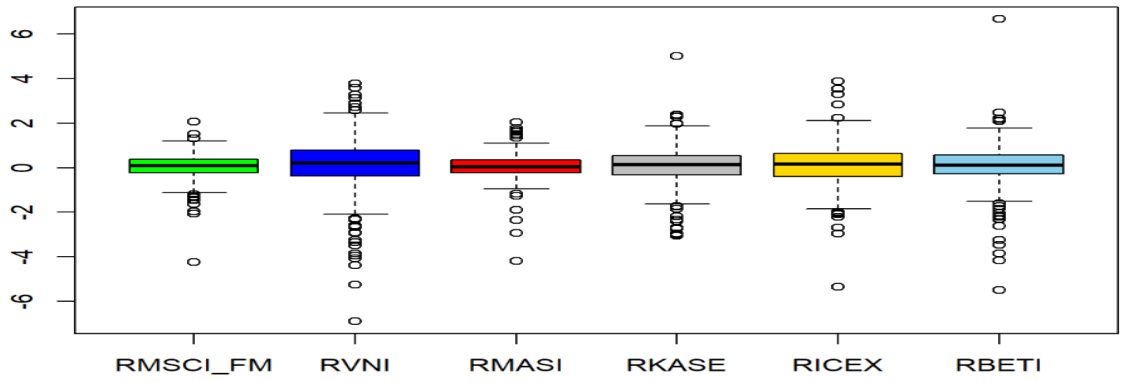
4. Presentation and discussion of the results

4.1. Preliminary analysis

According to figure 2, atypical values are suspected in the logarithmic returns of all the studied indices, including the reference index (MSCI_FM), in addition to that, and according to figure n°3, we see that the returns of the indices of the five studied countries have experienced a downward trend, thus negative returns on February 24, 2022.

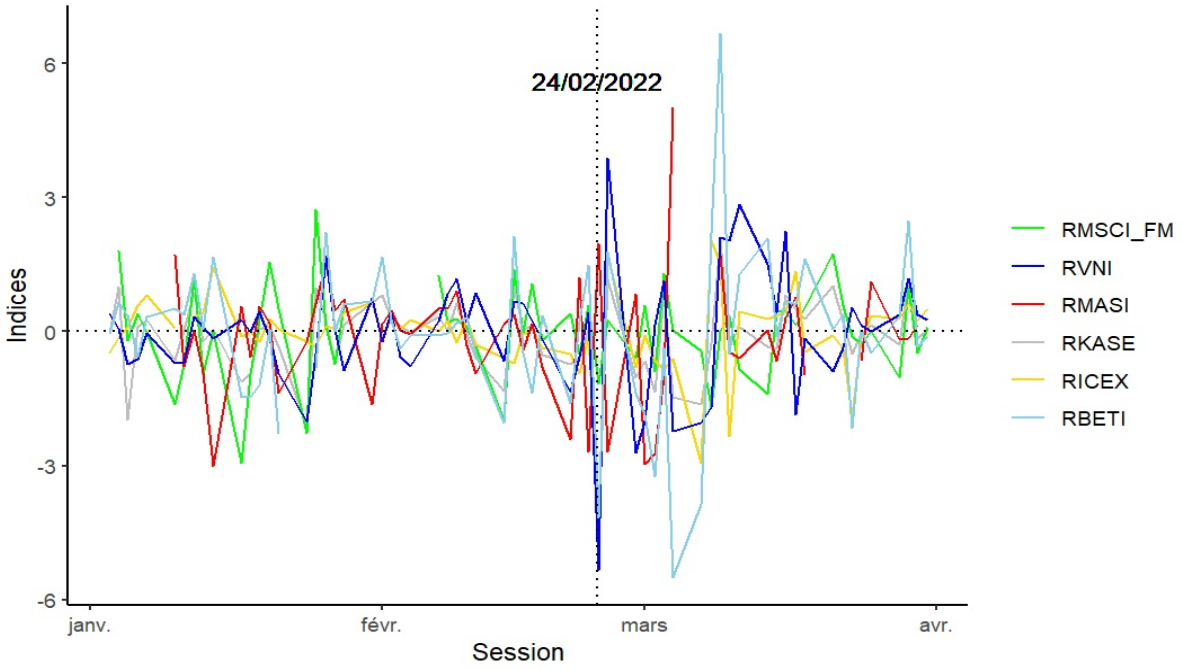
This can be considered as a response of the stock markets under investigation to a specific incident, most likely related to the conflict between Russia and Ukraine. However, the indices experienced significant volatility after this date, which might also be an indication of the reaction and instability of the studied stock markets. To test these hypotheses, and affirm or refute the effect of the war on the five studied markets, more techniques are required and will be shown later.

Figure 2: Box plot of the logarithmic returns of the studied indices



Source: developed by the authors using R software

Figure 3: The evolution of the logarithmic returns of the indices studie*d*



Source: developed by the authors using R software

4.2. Model generating theoretical returns

4.2.1. Unit root test

To be able to calculate the theoretical returns, we need to estimate the parameters of the yield generator model, then we need to ensure the stationarity of the used series, which is why we will use the Augmented Dickey-Fuller (ADF) test.

Table 2: ADF test

Model	Results						Critical values		
	RMSCI_FM	RVNI	RMASI	RICEX	RKASE	RBETI	1%	5%	10%
M_3	-11,8778	-12,0837	-12,6879	-11,2874	-11,1812	-11,8103	-3,98	-3,42	-3,13
M_2	-11,6875	-12,0913	-12,5683	-11,2726	-10,9944	-11,7578	-3,44	-2,87	-2,57
M_1	-11,6716	-12,0242	-12,4839	-11,1586	-10,9255	-11,6751	-2,58	-1,95	-1,62

Source: developed by the authors using R software

According to the simplified strategy of the Augmented Dickey-Fuller test, we can deduce that the six series studied are all stationary at the 1% threshold (table 2).

4.2.2. Estimation of the basic model

The results in table 3 show that the estimation of the Sharpe (1963) market model for the five countries, according to Fisher's overall significance test, are all globally significant at least at the 5% level.

The findings indicate also that all beta coefficients are statistically significant at a 5% threshold. Moreover, in the case of Vietnam, the returns of VNI index with a beta of 1,875 is 87% more volatile than the returns of frontier market benchmark index MSCI_FMI. In contrast to the other studied countries, whose indices with betas between 0 and 0,5 are generally less volatile than the overall frontier market index during the period under study.

Table 3: Results of the estimation of the market model

$E(RVNI_t)^{theorical} = \hat{\alpha} + \hat{\beta} RMSCI\_FM_t$			
Coefficient	Estimation	t-statistic	p-value
$\hat{\alpha}$	-8,236 .10 $^{-05}$	-0,002	0,999
$\hat{\beta}$	1,875	18,944	2 .10 $^{-16}$ ***
F-statistic $_{(1;\ 255)\ df}$: 358,9		p-value: 2,2 .10 $^{-16}$ ***	
$E(RMASI_t)^{theorical} = \hat{\alpha} + \hat{\beta} RMSCI\_FM_t$			
Coefficient	Estimation	t-statistic	p-value
$\hat{\alpha}$	0,06405	2,433	0,0157 **
$\hat{\beta}$	0,18972	3,990	8,59 .10 $^{-05}$ ***
F-statistic $_{(1;\ 259)\ df}$: 15,92		p-value: 8,593 .10 $^{-05}$ ***	
$E(RICEX_t)^{theorical} = \hat{\alpha} + \hat{\beta} RMSCI\_FM_t$			
Coefficient	Estimation	t-statistic	p-value
$\hat{\alpha}$	0,11267	2,262	0,0245 **
$\hat{\beta}$	0,20417	2,151	0,0324 **
F-statistic $_{(1;\ 261)\ df}$: 4,629		p-value: 0,03236 **	
$E(RKASE_t)^{theorical} = \hat{\alpha} + \hat{\beta} RMSCI\_FM_t$			
Coefficient	Estimation	t-statistic	p-value
$\hat{\alpha}$	0,07775	1,610	0,109
$\hat{\beta}$	0,48306	5,341	2,07 .10 $^{-07}$ ***
F-statistic $_{(1;\ 250)\ df}$: 28,53		p-value: 2,073 .10 $^{-07}$ ***	
$E(RBETI_t)^{theorical} = \hat{\alpha} + \hat{\beta} RMSCI\_FM_t$			
Coefficient	Estimation	t-statistic	p-value
$\hat{\alpha}$	0,09969	2,282	0,023271 **
$\hat{\beta}$	0,30985	3,790	0,000187 ***
F-statistic $_{(1;\ 262)\ df}$: 14,36		p-value: 0,0001872 ***	

Source: *developed by the authors using R software*

4.3. Calculation of abnormal returns

Table 4 shows the results of the parametric t-test for abnormal returns, and since the results for the gap window or before the date of the event under study do not reveal any significant abnormal returns, we focus on the window after t0 (24/02/2022) until t25 (31/03/2022).

Table 4: Parametric t-test results for abnormal returns AR

Country	Vietnam (RVNI)	Morocco (RMASI)	Island (RICEX)	Kazakhstan (RKASE)	Romania (RBETI)
T	**AR (p-value)**	**AR (p-value)**	**AR (p-value)**	**AR (p-value)**	**AR (p-value)**
t_0	6.80108007 (0.999986474)	**-3,453326937 (0,000232598***)**	**-4,59082047 (0,0009145402***)**	-0,71419658 (0,279747894)	**-2,9501897 (0,045776007**)**
t_1	**-1.92632784 (0.097861468*)**	1,402394059 (0,932979468)	3,52259567 (0,99264556)	1,32385255 (0,859187498)	1,32105971 (0,77769663)
t_2	1.36166252 (0.820822548)	-0,661448034 (0,237897624)	**-2,59872416 (0,0340379179**)**	**-2,25944899 (0,034759431**)**	-1,14599845 (0,25346374)
t_3	1.81583613 (0.888915421)	-0,025991492 (0,488793676)	**-1,96930805 (0,0818680563*)**	1,08005448 (0,810663139)	-1,75038604 (0,15610681)
t_4	1.63447503 (0.864429734)	-0,475926827 (0,303722029)	0,31496013 (0,588975255)	**-2,38370642 (0,028010002**)**	**-2,92721374 (0,047016187**)**
t_5	-0.28614000 (0.423159159)	-1,062771666 (0,126924499)	0,85300388 (0,728446298)	**-3,22543594 (0,005488844***)**	-0,72929795 (0,33618622)
t_6	2.78241557 (0.967978588)	-0,400723797 (0,332608957)	**-2,02930049 (0,0757623429*)**	-0,33672156 (0,391441796)	**-5,14431871 (0,002111932***)**
t_7	2.62161341 (0.959789381)	**-2,693964434 (0,002590152***)**	**-1,82200245 (0,098476808*)**	3,94461582 (0,998885889)	**-3,45685119 (0,024616768**)**
t_8	-1.20875010 (0.207219962)	2,027666927 (0,983832104)	-1,76465515 (0,105590489)	1,80589154 (0,927921209)	2,18286247 (0,89555989)
t_9	**-3.86380189 (0.005673531***)**	1,068833995 (0,874406695)	1,57299782 (0,867865258)	-0,58922482 (0,314983766)	5,94032455 (0,99944480)
t_{10}	0.97377580 (0.744810683)	**-2,350222666 (0,006916795***)**	1,99322203 (0,92061013)	-0,5156534 (0,336604102)	-0,50399132 (0,38499525)
t_{11}	-1.05369017 (0.238232991)	0,363248249 (0,652589052)	2,71107608 (0,97132135)	0,13352393 (0,543522578)	1,14438514 (0,74623847)
t_{12}	-0.77596813 (0.299804976)	0,277157741 (0,617697195)	1,46691441 (0,851278747)	-1,12543493 (0,179575428)	2,09492215 (0,88624360)
t_{13}	1.14882456 (0.781096491)	0,365973342 (0,653673877)	0,38795345 (0,609108502)	-0,01232191 (0,495975424)	-0,09111904 (0,47891192)
t_{14}	-1.09777502 (0.229158084)	0,22859786 (0,597550211)	1,95531894 (0,916654645)	0,55148083 (0,674000169)	0,35309429 (0,58117146)
t_{15}	-0.78493265 (0.297706355)	1,193329272 (0,899553919)	**-2,06504685 (0,0722978412*)**	-1,04003792 (0,198219506)	0,35246061 (0,58102786)
t_{16}	-0.02359726 (0.493622474)	-0,567168929 (0,270313322)	-0,32497945 (0,4082455)	-0,79968535 (0,256838415)	1,43719648 (0,79706507)
t_{17}	-0.18219105 (0.450886456)	-0,33589236 (0,358371088)	-1,22189649 (0,19232003)	1,17643856 (0,830997821)	-0,37124329 (0,41472082)
t_{18}	0.18163673 (0.548964892)	-0,477427285 (0,303157545)	-0,52019483 (0,355207476)	-0,83393529 (0,247951319)	0,21183515 (0,54892242)
t_{19}	0.84068109 (0.715186740)	**-1,876516072 (0,023448285**)**	0,52920685 (0,647181439)	-0,14750101 (0,451943319)	-2,09865384 (0,11334905)
t_{20}	-0.17889528 (0.451770386)	-0,20740831 (0,41132914)	0,05101077 (0,514532444)	0,03822258 (0,512482344)	-0,0609891 (0,48588128)
t_{21}	-0.24409506 (0.434335243)	0,261030896 (0,611039655)	-0,12719811 (0,463805639)	-	-0,61023646 (0,36168734)
t_{22}	-0.47325789 (0.374311441)	0,287560052 (0,621972703)	0,33383741 (0,594207646)	-	0,35138217 (0,58078347)
t_{23}	-1.24928989 (0.199535888)	0,350577927 (0,647528346)	0,81920736 (0,720427774)	-	2,00178074 (0,87572549)
t_{24}	-0.20146013 (0.445723626)	0,200749596 (0,585870631)	0,30381995 (0,585879686)	-	-0,38566233 (0,41146413)
t_{25}	0.02895350 (0.507824961)	0,449146608 (0,68612284)	0,13229811 (0,53764121)	-	-0,22402709 (0,44827777)

Source: developed by the authors using R software

The results of the parametric test (t-test) show that the stock markets of Morocco, Iceland, and Romania reacted negatively on the day of event t0 to the geopolitical conflict between Russia and Ukraine, in so far as the returns of MASI (RMASI) and ICEX (RICEX) consecutively suffered negative abnormal returns, statistically significant at the 1% critical level, of the order of -3.45% and -4.59%. In addition, BETI (RBETI) returns recorded an abnormal return of -2.95% which is statistically significant at the 5% level. As for the Vietnam stock market, the reaction to the event under study was observed only on the day after the aforementioned date, more precisely t1, with an abnormal return also negative (AR = -1.92%) statistically significant at the 10% threshold. We should not forget to mention that the shock of the crisis between Russia and Ukraine continued in the days following 24/02/2022, as shown in the table above.

4.4. Calculation of cumulative abnormal returns

To complete our analysis, we will use the calculation of cumulative abnormal returns, for different windows surrounding the event date in addition to the windows that focus on periods after the event date of the war between Russia and Ukraine (24/02/2022).

Table 5 presents the cumulative abnormal returns for the five countries studied, the significance of which is testing for event windows through the t-test, representing the parametric test, as well as the Wilcoxon signed rank test, representing the non-parametric test. The results of the t-test showed that the cumulative abnormal returns of Vietnam give no impression of significance regardless of the window considered, unlike the Wilcoxon signed rank test which supports the presence of abnormal returns for several windows around the event date, mainly [-20,20] at the 5% threshold. For the Moroccan case, we see compatibility in terms of the significance of the cumulative abnormal returns, which are negative, and amount to -9.98% and -6.12%, especially for [-10.10] and [-5.5]. Regarding Iceland and Romania only the parametric test (t-test) supports the detection of negative cumulative abnormal returns for both windows around the event date and for windows after the event. In contrast to Kazakhstan, whose parametric and non-parametric test results reveal the insignificance of cumulative returns for windows surrounding 24 February 2022, as well as for posterior windows.

The choice to use the non-parametric Wilcoxon test is justified by taking into account the limitations of the parametric test, as well as the fact that the results can vary considerably depending on the context. Although the five studied countries are not directly engaged in the Russian-Ukrainian conflict, the findings indicate that their stock markets have been significantly affected by the conflict. The CAR, which suggests that the crisis's effects on the studied stock markets continued, supports the negative responses indicated by the parametric test of Abnormal Returns.

The reaction of the studied stock markets is consistent with the "war ruin" hypothesis, which suggests that stock market investors react negatively to war events. Indeed, armed conflict could have potentially significant effects on the global economy, including trade disruptions, supply chain disruptions, and heightened geopolitical risks, especially when a major economic power like Russia is involved, and such a negative reaction is justified.

To this end, the announcement of the armed conflict between Russia and Ukraine led to investors' disappointment in the stock markets of Vietnam, Morocco, Island, Kazakhstan, and Romania, which led to a decline in the value of stock investments in these countries.

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Table 5: Results of Cumulative Abnormal Returns

Country			Around Event Day					Post Event Day				
			[-25,25]	[-20,20]	[-15,15]	[-10,10]	[-5,5]	[0,25]	[0,20]	[0,15]	[0,10]	[0,5]
Vietnam (VNI)	CAR		16,95446	**19,60786**	14,24878	**16,08029**	**13,85784**	6,640782	8,779932	8,142297	10,70584	13,85784
	p-value	t-test	0,9455318	0,9793886	0,9565034	0,9878868	0,9923262	0,8126158	0,9014746	0,9128959	0,976705	0,9923262
		W.R.S-test	0,1079	**0,03042****	0,1574	**0,04208****	**0,05371***	0,9205	0,5168	0,4332	0,3203	0,4375
Morocco (MASI)	CAR		**-9,122388**	**-10,44807**	**-7,763336**	**-9,980054**	**-6,120324**	**-6,112522**	**-7,661587**	-4,197174	**-6,625481**	**-6,120324**
	p-value	t-test	**0,08367067***	**0,04022406****	**0,06721684***	**0,01273673****	**0,03241844****	**0,09831093***	**0,03912854****	0,1293409	**0,02443188****	**0,03241844****
		W.R.S-test	0,2667	**0,09227***	0,1954	**0,03844****	**0,04199****	0,5317	0,2722	0,7057	0,3203	0,3125
Island (ICEX)	CAR		-5,146157	-4,373999	-2,226561	-6,805906	**-6,118162**	-2,086704	-3,548668	-2,061815	**-6,518031**	**-6,118162**
	p-value	t-test	0,3018412	0,3111601	0,3862406	0,1441198	**0,09911925***	0,3835229	0,2877842	0,3540277	**0,08653091***	**0,09911925***
		W.R.S-test	0,7323	0,7878	0,9923	0,5392	0,4648	0,9801	0,7593	0,782	0,4131	0,6875
Kazakhstan (KASE)	CAR		-	-4,667444	-4,365245	-3,407756	**-7,989403**	-	-3,929224	-3,362763	-1,869973	**-7,989403**
	p-value	t-test	-	0,2734698	0,2584254	0,2689251	**0,0336175****	-	0,2391131	0,243205	0,3189828	**0,0336175****
		W.R.S-test	-	0,4962	0,4678	0,5392	0,2402	-	0,4733	0,5282	0,7646	0,3125
Romania (BETI)	CAR		-8,410093	-6,693241	-8,17633	**-10,81285**	**-9,064768**	-5,058875	-6,192112	-5,310257	**-9,164**	**-9,064768**
	p-value	t-test	0,2455301	0,270288	0,1954959	**0,08727999***	**0,06440406***	0,2802745	0,2146217	0,218578	**0,06259148***	**0,06440406***
		W.R.S-test	0,3808	0,5294	0,3271	0,179	0,1016	0,5153	0,4948	0,5619	0,3203	0,1563

Source: *developed by the authors using R software*

5. Conclusion

In conclusion, our study has aimed to study the reaction of the main frontier markets, namely the stock markets of Vietnam, Morocco, Iceland, Kazakhstan, and Romania to the geopolitical conflict between Russia and Ukraine in 2022, based on an event study approach. The results of our study highlight a negative reaction, which lasted even after the date of 24 February 2022, of the frontier markets to the Russian-Ukrainian crisis, which can be explained by the war ruin hypothesis, while reflecting the pessimistic perception of investors in the financial markets towards the war events.

These results have important implications for investors and economic policymakers. Firstly, they show that geopolitical conflicts can have a significant negative effect on financial markets, even those located at a geographical distance. Investors may be concerned about the economic and political uncertainties generated by conflicts and may respond by reducing their investments in the affected markets. Furthermore, the results can also help to identify the factors that influence financial market reactions to geopolitical conflicts, such as investors' perceptions of risks and opportunities, as well as financial market dynamics. In addition, the results of our study can also help economic policymakers to better understand the potential effects of policy on financial markets and to evaluate public policies to mitigate the negative impacts of conflicts on financial markets. Policies may include promoting political and economic stability, as well as implementing measures to enhance investor confidence in stock markets.

Finally, given that our research is among the work that was conducted at the beginning of the current crisis between Russia and Ukraine, it would be wise to complete the analysis of the effects of the mentioned crisis on the financial sphere as well as for the real sphere.

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