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The Impact of the Russia-Ukraine War on the Cryptocurrency Market

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This research provides the very first empirical investigation of the impact of the Russia-Ukraine war on the cryptocurrency market (Bitcoin trading volume, and returns). The findings indicate that the Russia-Ukraine war impedes Bitcoin trading volume. A 1% increase in the Russia-Ukraine war leads to a 0.2% reduction in Bitcoin trading volume. The findings also indicate that the impact is more pronounced during the post-invasion period, especially after one week of the invasion. Finally, the Russia-Ukraine war predicts Bitcoin returns in both the short and long run.

I. Introduction

Russia invaded Ukraine on 24 February 2022, following a prolonged period of military deployment along Ukraine's borders (Boungou & Yatié, 2022). According to Statista, the war has resulted in the deaths of 4, 677 civilians and the displacement of over 8 million people as of 23 June 2022.[1] The conflict has impacted the global economy, food security, and geopolitics (Pereira et al., 2022). In the financial market, the recent conflict has impacted stock market returns (Boubaker et al., 2022; Boungou & Yatié, 2022), commodity market (Appiah-Otoo, 2022), and corporate decisions (Tosun & Eshraghi, 2022). However, it is unknown whether the war has had any influence on the cryptocurrency market, especially Bitcoin trading volume and returns.

Cryptocurrencies are appealing to investors since they are frequently seen as a "safe haven" investment (Cheng & Yen, 2020). Bitcoin, the most popular cryptocurrency, has piqued the curiosity of investors, the public, and scholars (Kalyvas et al., 2020). Several researchers have recently demonstrated how Bitcoin possesses hedging capabilities towards economic instability (Mokni et al., 2020), and may be used as a hedge and safe haven across currencies (Kalyvas et al., 2020). It could also be used as a hedge amid certain market circumstances (Cheng & Yen, 2020). Furthermore, using Bitcoin in investment portfolios has been demonstrated to provide significant gains as well as boost risk-adjusted outcomes (Brière et al., 2015). To this end, the objective of this study is to explore the impact of the ongoing Russia-Ukraine war on Bitcoin trading volume and returns. Understanding this link will aid investors and asset managers in determining an optimal asset allocation strategy and hedging choices.

Following Boungou and Yatié (2022), this study first examines the effect of the Russia-Ukraine war on Bitcoin trading volume and finds that the Russia-Ukraine war impedes Bitcoin trading volume. It then examines how Bitcoin trading volume responded to the period before the invasion (pre-invasion i.e., 23 January to 23 February 2022) and the period after the invasion (post-invasion i.e., 24 February to 16 April 2022), and finds that the impact of the conflict on Bitcoin trading volume is more pronounced in the post-invasion period. Furthermore, the study explores whether the impact differed during the first week of the invasion (24 February 2022 to 3 March 2022) and after the first week of the invasion (4 March 2022 to 16 April 2022) and finds that the impact of the conflict on Bitcoin trading volume is greater after the first week of the invasion. Finally, the study demonstrates that the Russia-Ukraine war predicts Bitcoin returns in both the short and long run.

The study adds to the growing body of knowledge about the impact of the Russia-Ukraine war on the financial market by presenting the very first empirical investigation of the impact of the Russia-Ukraine war on the cryptocurrency market. This study also adds to the voluminous literature on the determinants of Bitcoin trading volume and returns (Mokni et al., 2020; Panagiotidis et al., 2018; Wang et al., 2022; Wu et al., 2022) by also presenting the impact of the Russia-Ukraine war on Bitcoin trading volume and returns.

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1 https://www.statista.com/topics/9087/russia-ukraine-war-2022/#dossierKeyfigures retrieved 29 June 2022

II. Data and Methodology

A. Data

This study examines the impact of the Russia-Ukraine war on Bitcoin trading volume and returns. Regarding the impact of the Russia-Ukraine war on Bitcoin trading volume, the study uses panel data of twenty countries[2] with dates ranging from 23 January 2022 to 16 April 2022. Although the war began on 24 February 2022, many global leaders had long planned for it and felt it was only a matter of time until it began (Boungou & Yatié, 2022), therefore justifying the study's start from 23 January 2022. The countries are also chosen based on the availability of data. Coin dance (https://coin.dance/volume/localbitcoins) serves as the source of the Bitcoin trading volume data, while Google Trends serves as the source for the Russia-Ukraine war data (https://trends.google.com/trends). This study conducts a 90-day search using the terms "Russia and Ukraine and war". The first differences of the natural logarithm of Bitcoin prices are used to generate the time-series data on Bitcoin returns. Except for Bitcoin returns, we log-transform all the variables to show the results as elasticities and to provide efficient outcomes (Appiah-Otoo, Song, et al., 2022).

B. Methodology

To examine the impact of the Russia-Ukraine war on Bitcoin trading volume, the study estimates the following model:

$$lnbitcoin_{it} = \alpha_0 + \gamma lnwar_{it} + \mu_{it} \quad (1)$$

where $lnbitcoin$ denotes Bitcoin trading volume; $lnwar$ denotes the Russia-Ukraine war; and μ represents the error term. Country and time are represented by i and t. We expect γ to be positive and statistically significant. This is because Bitcoin possesses hedging capabilities toward economic instability (Mokni et al., 2020).

We estimate Equation (1) using the IV-GMM method. This method is suitable for the estimation of Equation (1) given the small period, a large number of countries, omitted variables, and the issues of endogeneity (Appiah-Otoo, Acheampong, et al., 2022; Appiah-Otoo & Song, 2021). We also use the fixed effects (FE) method for robustness testing. This method also addresses country-specific fixed effects issues.

To also scrutinise the influence of the Russia-Ukraine war on Bitcoin returns, we use a quantile regression. Quantile regression has the advantage of estimating conditional average performance models using numerous additional conditional quantile functions (Zeinedini et al., 2022). Quantile regression can also produce an additional all-inclusive numerical examination of the randomized connections amid regressors (Koenker & Hallock, 2001).

The model is stated as follows:

$$y_t = \alpha_0 + \varphi q x_t + \mu_t \quad (2)$$

where y_t signifies Bitcoin returns (pr); x_t is the natural logarithm of the Russia-Ukraine war $(lnwar)$; and μ indicates the error term. Time is denoted by t; α is the constant term, while q is the quantile $(0 < q < 1)$ of the conditional distribution.

III. Results and discussion

This section presents the results. Table 1 shows the results on the effect of the Russia-Ukraine war on Bitcoin trading volume. The full sample period results based on the IV-GMM and FE techniques show that the war impedes Bitcoin trading volume. A 1% rise in the Russia-Ukraine war leads to a 0.247% reduction in Bitcoin trading volume according to the IV-GMM estimates, while a 1% rise in the Russia-Ukraine war leads to a 0.784% reduction in Bitcoin trading volume according to the FE estimates. Thus, Bitcoin trading volume remains sensitive to the Russia-Ukraine war. This conflicts with our expectations but aligns with previous studies that document uncertainties to impede Bitcoin growth (Mokni et al., 2020). Thus, Bitcoin remains a speculative asset.

Turning to the pre- and post-invasion periods, the IV-GMM estimates indicate that the war has a negative effect on Bitcoin trading volume in both periods; however, the negative effect is only significant in the post-invasion period. The pre-invasion findings are collaborated by the FE estimates, albeit statistically significant, while the post-invasion findings remained contradictory. These differences could be attributed to the fact that the IV-GMM technique resolves endogeneity issues, while the FE does not.

Moving to the weeks of the invasion results in Table 2, we observe that the Russia-Ukraine war has a negative and statistically significant impact on Bitcoin trading volume only after the first week of the invasion, based on the IV-GMM technique.

Table 3 shows the Bitcoin returns results. The Russia-Ukraine war has a positive and statistically significant effect on Bitcoin returns in the 20th quantile, while it has a negative and statistically significant effect on Bitcoin returns in the 70th quantile. Thus, the Russia-Ukraine war predicts Bitcoin returns in both the short and long run. Thus, investors should take into consideration the Russia-Ukraine war when allocating assets and designing hedging strategies in the Bitcoin market. Also, policymakers should devise strategies to help combat the adverse impact of the Russia-Ukraine war on the Bitcoin market.

Figure 1 displays a plot of the quantile regression results for the impact of the Russia-Ukraine war on Bitcoin returns. The figure shows that the Russia-Ukraine war has a negative effect on Bitcoin returns on average across all the quantiles.

2 Australia, Brazil, Canada, China, Denmark, India, Japan, Kenya, Nigeria, Pakistan, Poland, Romania, Russia, South Africa, Tanzania, Thailand, Turkey, United Kingdom, United States of America, and Vietnam.

Table 1. Russia-Ukraine war and Bitcoin trading volume

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	FE results			IV-GMM results		
	Full period	Pre-invasion	Post-invasion	Full period	Pre-invasion	Post-invasion
lnwar	-0.784***	-0.794***	0.056**	-0.247**	-0.028	-0.375**
	(0.061)	(0.082)	(0.028)	(0.115)	(0.120)	(0.166)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	13.216***	13.226***	0.000	13.443***	13.274***	14.784***
	(0.708)	(0.642)	(.)	(0.447)	(0.429)	(0.755)
Observations	882	241	641	620	147	473
R^2				0.166	0.068	0.150
RMSE	1.577	1.425	0.356	1.174	0.700	1.284
F-statistics				1.134	0.295	1.425
Hansen test				0.048	0.489	0.218
Hansen test p-value				0.826	0.484	0.641

Notes: Full period covers 24 January 2022 to 16 April 2022; pre-invasion period covers 24 January 2022 to 23 February 2022; post-invasion period covers 24 February 2022 to 16 April 2022; standard errors are in parentheses; $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 2. Weeks of invasion

Variables	Model 1	Model 2	Model 3	Model 4
	FE results		IV-GMM results	
	First week	After the first week	First week	After the first week
lnwar	0.008	0.025	0.260	-0.389**
	(0.035)	(0.035)	(1.331)	(0.153)
Time dummies	Yes	Yes	Yes	Yes
Constant	11.499***	0.000	11.971**	13.571***
	(0.436)	(.)	(5.907)	(0.642)
Observations	119	522	86	387
R^2			0.080	0.093
RMSE	0.128	0.360	1.729	1.167
F-statistics			3.048	0.899
Hansen test			0.328	0.613
Hansen test p-value			0.567	0.434

Notes: First week covers 24 February 2022 to 3 March 2022; after first week covers 4 March 2022 to 16 April 2022; standard errors are in parentheses; $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 3. Russia-Ukraine war and Bitcoin returns

Variables	Model 1	Model 2	Model 3	Model 4
	0.20	0.50	0.70	0.90
lnwar	0.004***	0.000	-0.001*	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Constant	-0.015***	-0.000	0.008***	0.009***
	(0.003)	(0.003)	(0.003)	(0.002)
Observations	83	83	83	83

Notes: This table shows the quantile regression results for the impact of the Russia-Ukraine war on Bitcoin returns. The standard errors are in parentheses. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

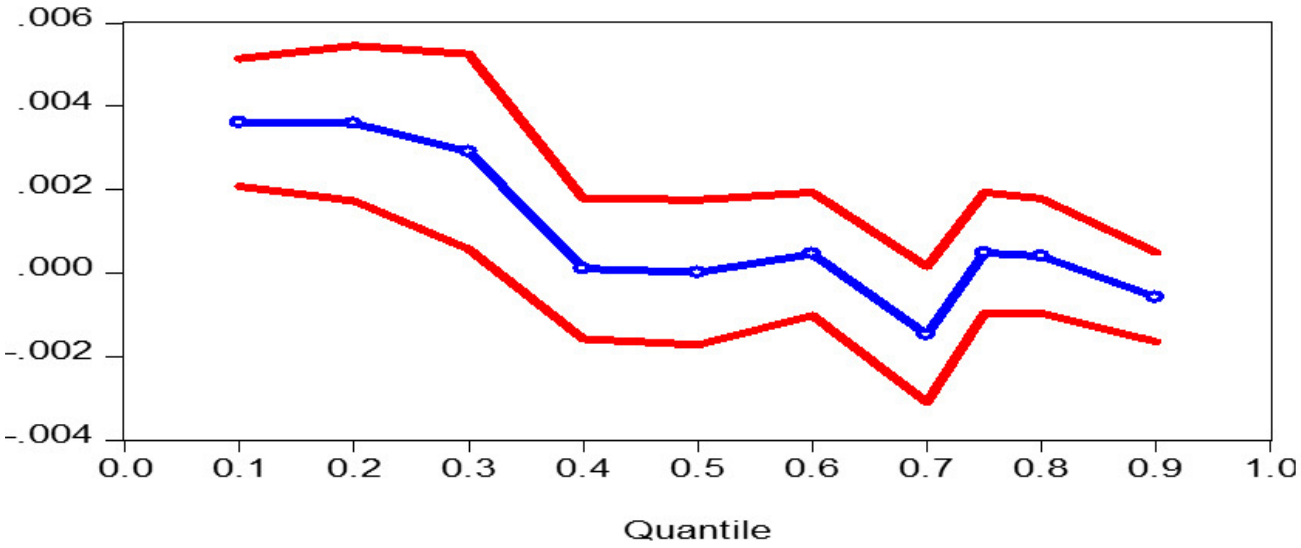

Figure 1. Plot of the quantile regression results.

Notes: The point estimates of the quantile regression coefficients for every quantile are shown in blue lines. The 95% confidence intervals are shown in red.

IV. Conclusion

This study examines the impact of the Russia-Ukraine war on the cryptocurrency market (Bitcoin trading volume and returns). The findings indicate that the Russia-Ukraine war impedes Bitcoin trading volume. The findings also indicate that the impact is more pronounced during the post-invasion period, especially after one week of the invasion. Finally, the Russia-Ukraine war impedes Bitcoin returns in the long-run

This study focuses only on Bitcoin given its popularity and dominance. Future studies should use alternative cryptocurrencies to re-estimate these associations. Future studies should also explore the causal association between the Russia-Ukraine war and Bitcoin trading volume and returns. Finally, a more recent dataset can be employed to validate these findings.

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