The impact of geopolitical tensions on asset prices: Stock prices affected by popularity.

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1 Abstract

In order to gain understandings of stock market's vulnerability, we gathered data from four cases of stocks (S&P500, NASDAQ, Northrop Grumman and Aerojet Rocketdyne) as well as from wikitrends on expressing the general popularity of the events of Ukraine-Russia war. Having a linear model constructed,the ordinary least squares method unveil to us that those stocks affected negatively from the war interact positively with it's popularity, although, those affected postively from the war are negatively correlated with it's popularity.

2 Introduction

The world economy and financial markets are significantly impacted by geopolitical conflicts. The values of assets like stocks, bonds, commodities, and currencies can fluctuate when there are tensions between nations or regions. These tensions may have an impact on investor descisions, which might amplify market volatility. Thus, it is crucial to comprehend how changes in political and social factors might affect investment decisions as well as the connection between geopolitical tensions and asset price returns.

This letter's subject is to get a practical insight on how vulnerable the stock market is, geopolitical tensions are able to affect prices significantly, but how much exactly? We study the alternations in stock prices due to the Ukraine-Russia war for four cases of stocks, S&P500, NASDAQ, Northrop Grumman and Aerojet Rocketdyne. We aim to examine a possible correlation between the amount of war's coverage/popularity and stock prices. This approach emerged in the context of stock market adjustments derived from public opinion, statements and emotions (An Analysis of the Correlation between Internet Public Opinion and Stock Market,Rui Li,DianZheng Fu, Zeyu Zheng-2017).

As it has been examined by Whelsy Boungou and Alhonita Yatié in their letter "The impact of the Ukraine–Russia war on world stock market returns", there is a negative relationship between the Ukraine-Russia war and world stock market. Thus, we expect to spot negative impact of the war on the stock market.

Having a simple linear model estimated with the ordinary least squares method, we made the understanding that the stocks that have been affected negatively have a positive correlation with the popularity measure, whereas, the stocks that were boosted by the events of war have negative correlation with the extent of circumstances popularity. The aforementioned conclusion suggests that from the deprived stocks aspect, the more the human rights and the outcomes of war's actions are discussed the better the stock price's course. Contrariwise, the stocks that gained from the war, are weakening as the matter grows in popularity.

3 Data and Model

Weekly stock prices (ST) of S&P500, NASDAQ, Northrop Grumman and Aerojet Rocketdyne have been gathered from Yahoo Finance for the period of November 2021 throughout March 2023. As far as the popularity measure is concerned, it arose from Wikitrends (WT) and it could be identified as the war's coverage in favour of the human rights. Additiionaly, a dummy variable (D)will be used in order to note the prices before and after the events of war.

Table 1. Summary Statistics					
	Mean	St. deviation	Minimum	Maximum	Obs
S&P 500	4143.6	313.1	3609.7	4778.14	73
Nasdaq	13040.1	1467.8	10720.0	16600.2	73
North Groupman	455.5	50.0	354.4	544.9	73
Aerojet Rocketdyne	45.4	6.4	36.7	56.1	73
Wikitrends	24382.9	86274.7	3983	736038	73
War	.78	.41	.0	1	73

https://finance.yahoo.com, https://www.wikishark.com

The empirical model used in this study is the following linear regression (1). In this letter, the coefficients will be estimated with the ordinary least square method as it is frequently used because of its convenience and effectiveness. This model aims to explore the relationship of an event's discussion on Wikitrends and the stock market prices. Its results could ignite an extensive look with the effects of popularity on assets.

$$(1) ST_{i,t} = b_0 + b_1 WT_t + b_2 D_t + U_{i,t}$$

Where ST refers to the stock i on time t, WT stands for the Wikitrends/popularity of event's discussion on time t and D is the dummy variable that show us whether time t refers to pre or post war.

4 Results

With the ordinary least squares method we were able to estimate the model's coefficients and get an inshight on the impact that war and popularity have on stock market. As it is examined, S&P500 and Nasdaq indices have significantly lower price due the war as the dummy coefficients are negative, but there is a positive correlation between these indices and the popularity of the circumstances as the coefficients are positive. However, the stock prices of Northop Grumman and Aerojet Rocketdyne are increased as the events of war conducted, the dummies coefficients are positive, whereas, popularity is negatively correlated with these stocks.

As it seems the correlations between the stocks that lost value and the stocks that gained are exactly the opposite. The stocks that lost value are benefitted by increased discussions of the war, yet, those who gained value would not.

Table 2. Coefficients (OLS)

	S&P 500	NASDAQ
Wikitrends	.00052***(.00008)	.0023***(.00041)
War Dummy	-573.32***(47.50)	-3215.5***(265.69)
R-squared	.59	.66
Observations	73	73

	Northrop Grumman	Aerojet Rocketdyne
Wikitrends	-.00009***(.000009)	-.000017***(.000005)
War Dummy	99.14***(6.08)	3.75***(1.17)
R-squared	.69	.11
Observations	73	73

Signif. codes: '***' 1% , '**' 5% , '*' 10%

5   Conclusion

As it is observed, geopolitical tensions are able to affect assets, such as stocks and stock market indices. It is quite important to understand asset vulnerability in order to manage the risks effectively. Given that, individuals and institutions can minimize their possible exposure and secure their investments but also construct a portfolio that takes the above principles into account.

In order to conclude everything stated above, stock market can be vulnerable not only to geopolitical risk, but also to the popularity of the matters, which is produced by the substantial empathy of public opinion. The results of the analysis suggest that S&P500 and Nasdaq stock prices have lost a significant amount of value, in contrast to Northop Grumman and Aerojet Rocketdyne stock prices that their value increased by the events of war.

However, what attracts the interest, is the fact that the stocks with decreased value have positive interaction with the popularity of war and those with increased value are negatively related with it. The outcome as it stands, indicates the significance of popularity on asset prices, these measurments could be important in evaluating a competitive market.

6   References

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