

IMPACT OF COVID-19 ON STOCK MARKET PERFORMANCE: THE EVIDENCE IN VIETNAM

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ABSTRACT

The purpose of this paper is to capture the investors' mood related to the COVID-19 pandemic and analyze its impact on the stock market returns of Vietnam. In order to capture the investor mood related to the COVID-19 pandemic, the authors construct a unique COVID-19 fear index based on the Search Volume Index (SVI) from Google Trends (<http://www.Google.com/trends/>) of the search terms related to COVID-19 words and phrases as revealed by Google and Internet dictionaries in Vietnamese. The COVID-19 fear index was used to investigate its impact on the stock market returns. The study finds a strong negative association between COVID-19 fear and stock returns in Vietnam. Unlike other studies, the relationship is persistent for a significant period. This relationship is not found to reverse in the following days. The results also highlight that COVID-19 fear strongly impacts the stock market. The sentiment persists for a significant period and is not reversed soon, unlike the regular times in earlier studies.

Keywords: Economic policy uncertainty, behavioral finance, COVID fear index

1. Introduction

During the era of COVID-19, the Vietnamese stock has performed abnormal movements. Specifically, when COVID-19 first arrived in Vietnam, the market plummeted and lost more than 30 percent; it took many months to recover. In July of 2020, the second wave of COVID-19 arose in Vietnam, accompanied by a notable event - the Da Nang lockdown, VN-Index was also dropped. In January 2021, being consistent with the third wave of COVID-19 in Vietnam, the market sharply dropped once again. In July 2021, due to a fourth wave of COVID with a traumatic nationwide lockdown, the VN-Index decreased dramatically. Such repeated market

behaviors share a common link which is whenever the COVID-19 experienced a sudden spike, the market suffered a dramatic dip. In this regard, previous research has investigated the impact of COVID-19 on the return of the stock market, and some of the conclusions drawn from those studies have been supported by empirical evidences such as Sowmya and Madhumita, 2021; Baker et al., 2020; Al- Awadhi et al., 2020; Phan and Narayan, 2020; Ashraf, 2020; Kartal et al., 2020; Zhang et al., 2020a; Sharif et al., 2020. Inspired by these former studies and the practical observations, this study is conducted to examine the impact of COVID-19 fear on the Vietnamese stock market, as measured by VN-Index performance during the period of 2022 to 2022.

2. Literature review

The impact of psychological fear on the asset price which is correlated with the stock return has been observed and studied in several recent research. Rick and Lowenstein (2008) suggested that human emotions can influence their decision making. The study of Sapolsky (1996) also showed that extreme and prolonged stress can affect cognitive skills. These arguments of impact of behavioral factors such as fear on the stock market return are not recognized in the efficient market theory. In the efficient market theory, the factors related to human emotions or mood are not supposed to have any additional influence on the stock market return after controlling fundamental variables. Only the fundamentals will alter pricing, thanks to arbitrage operations. Since some limitations of arbitrage, behavioral biases still can have a significant impact on asset price. Mispricing can be continued because the informed investors are unable to drive the prices toward fundamentals (Shleifer and Vishny (1997), Gromb and Vayanos (2002), Brunnermeier and Pedersen (2009)).

In this research we try to determine any relationship between COVID fear and stock market return in Vietnam. Based on psychological literature, we assume that when people are in an anxiety situation, their sense of uncertainty can be risen (Smith and Ellsworth, 1985; Ortony et al., 1988). Zhang et al. (2020) discovered that more pandemic uncertainty relates to higher market volatility and is unpredictable. The fear of uncertainty in the economic troubles can limit investors in investment or encourage them to panic selling. The purpose of the study is to identify the relationship between psychological fear related to COVID-19 and the stock market return even after controlling for fundamental factors that influence the economy and market.

Ortmann et al. (2020) examined retail investor behavior during the COVID-19 period using transactional level brokerage data. During COVID-19, investors lowered their use of leverage and boosted their weekly trading intensity, according to their research. Haroon and Rizvi (2020)

explored the influence of stock market volatility on sentiment assessed from COVID-19-related news. They discovered that panic-inducing news is linked to higher volatility in the stock market. In recent research, Salisu and Akanni (2020) created a global fear index by using the reported infection cases and the death index. They discovered that in OECD nations, the fear index is an excellent predictor of stock returns. By employing the Google search volume index to measure the fear index, we expand the work of Salisu and Akanni (2020) based on the database which is collected in Vietnam. The usage of Google search volume index to create a fear index is useful for measuring investors' attention and fear produced by the COVID-19 pandemic.

3. Methodology

The time frame we chose to collect data is from March 8th, 2020 to February 27th, 2022. In this paper, weekly time series data is applied. Overall, there are four main variables: market return (dependent variable), COVID fear index, Global Economy Policy Uncertainty (GEPU), and New COVID-19 cases, with the last two being the control variables for the regression function where we test the null hypothesis that COVID fear index has a negative impact on the stock market return. For this study, the market return is the weekly VN-Index percentage change.

3.1 Constructing the COVID fear index

The first step is to construct the COVID fear index. We came up with a list of 34 COVID-related words and phrases in Vietnamese as in the table 1 below.

Table 1. 34 COVID—related words and phrases in Vietnamese

34 COVID-related terms			
1	COVID-19	18	lam viec tai nha
2	khautrang	19	so ca tuvongCOVID
3	dich benh	20	nuoc sat khuan
4	viemphoi cap	21	cachly tap trung
5	phong toa	22	cachly tai nha
6	kit test	23	quy tac 5K
7	cachly	24	chi thi 16
8	hoi chungchauCOVID	25	khunghoang
9	COVID	26	pha san COVID
10	so ca nhiemCOVID	27	suythoai
11	trieuchungCOVID	28	that nghiep
12	giancachxa hoi	29	bung phat

13	hoc online	30	Vaccine COVID-19
14	bien chung delta	31	muinhaclai
15	mat vi giac	32	muibo sung
16	test PCR	33	thuockhang virus
17	bien chung omicron	34	sot

The Google search volume index (GSVI) of each term is obtained from Google Trends. The COVID fear index is then derived by taking the average of 34 weekly log changes of 34 Google search volume indices, as explained in the following formula:

$$COVID\ fear\ index_t = average(\Delta GSVI_{i,t}) = average(\ln(GSVI_{i,t}) - \ln(GSVI_{i,t-1}))$$

3.2 Control variables

Two control variables chosen are (1) Global economy policy uncertainty index - a risk wherein government policies and legal frameworks are undetermined for the foreseeable future, causing individuals and corporations to postpone spending and investment due to market uncertainty and (2) Absolute change in weekly new COVID-19 cases in Vietnam (data from WHO). We believe these two variables have a certain effect on the Vietnamese stock market return and COVID fear index: both GEPU and weekly new COVID-19 cases have a negative impact on market return and a positive relationship with the COVID fear index.

Because the data for the Vietnam economic policy uncertainty index is not available online, we chose the worldwide index because we feel it already accurately reflects the situation in Vietnam. To make sure that our control variables are relevant, in other words, to make sure that there are relationships between control variables versus the market return and the COVID fear index, we conducted a test to find the correlation between each of the two control variables with the dependent and independent variables.

3.3 OLS regression model

The relationship between the COVID-19 fear index and the stock market return will thereafter be determined using an OLS regression model:

$$Market\ return_t = \beta_0 + \beta_1 COVID\ fear\ index_t + \beta_2 \Delta GEPU_t + \beta_3 \Delta new\ cases_t + \epsilon_t$$

Where:

Market return_t is the VN – index return on week t

COVID fear index_t is the previously constructed COVID fear index on week t

$\Delta GEPU_t$ is the absolute change in the Globale economic policy uncertainty index on week t

$\Delta \text{new cases}_t$ is the absolute change in new COVID – 19 cases on week t

4. Data analysis

Before running regression, we test the relationship between variables including Delta new case, market return and COVID Fear Index and the relationship between Delta GEPU, market return and COVID Fear Index. In this matrix we find three relationships standardized according to the Pearson's R measure, which runs from -1 (perfect negative relationship) to +1 (perfect positive relationship), via 0 (no relationship). From the table, we have the result:

- Correlation between Delta New Case and market return = -0.01735
- Correlation between Delta New Case and COVID Fear Index = 0.0928
- Correlation between COVID Fear Index and market return = -0.2640
- Correlation between Delta GEPU and market return = -0.3905
- Correlation between Delta GEPU and COVID Fear Index = 0.1547

Table 2. Correlation between Delta New Cases, Market Return, and COVID Fear Index

CORRELATION BETWEEN DELTA NEW CASES, MARKET RETURN, AND COVID FEAR INDEX			
	<i>Delta New Cases</i>	<i>Market Return</i>	<i>COVID Fear Index</i>
Delta New Cases	1		
Market Return	-0.017357944	1	
COVID Fear Index	0.092875481	-0.264094644	1

Table 3. Correlation between Delta GEPU, Market Return, and COVID Fear Index

CORRELATION BETWEEN DELTA GEPU, MARKET RETURN, AND COVID FEAR INDEX			
	<i>Delta GEPU</i>	<i>Market Return</i>	<i>COVID Fear Index</i>
Delta GEPU	1		
Market Return	-0.390529605	1	
COVID Fear Index	0.154716105	-0.264094644	1

Then, we find p-value to make sure the outcome has statistically significant. Based on the result, we just have a correlation between Delta GEPU and market return and correlation between

COVID Fear Index and market return have statistically significant. (p-value < 0.05). Both COVID Fear Index and Delta GEPU has negative relationship with market return.

Table 4. t-score and p-value results

t-score	Delta GEPU	COVID Fear Index	Market return
Delta New Cases	-0.066345105	0.942068253	-0.175333061
Delta GEPU		1.581600163	-4.284376429
COVID Fear Index			-2.765406012
p-value	Delta GEPU	COVID Fear Index	Market return
Delta New Cases	0.947232941	0.348383606	0.861165526
Delta GEPU		0.116836887	0.000041586
COVID Fear Index			0.006749267

Table 5 Summary of output

SUMMARY OUTPUT	
<i>Regression Statistics</i>	
Multiple R	0.44160353
R Square	0.195013678
Adjusted R Square	0.170864088
Standard Error	0.027914088
Observations	104

The multiple R is the absolute value of the correlation coefficient of the dependence variable (Market return) and independence variable (Delta new case, Delta GEPU and COVID Fear Index) being evaluated. The correlation coefficient indicates how closely two variables move in tandem with each other. Multiple R equal 0.4416 shows that the relationship between the variable is not tight.

R Square = 0.195 indicates that the market return depends 19.5% on the input variables, the rest is due to factors not included in this model.

Adjusted R Square show that this regression model fits the sample's data set at 17.08%, the independent variables explain 17.08% of the variation of the dependent variable.

The standard error is also an important number because it measures the precision of the model. As the standard error reflects how wrong we could be, we want the standard error to be as small as possible. (standard error = 0.0279 is acceptable)

Table 6. ANOVA result

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	3	0.018876587	0.006292196	8.075237721	0.000071822078
Residual	100	0.077919632	0.000779196		
Total	103	0.096796218			

In the ANOVA table, testing the hypothesis about the overall fit of the model. The significance F is the probability that the null hypothesis in our regression model cannot be rejected and we would prefer significant F as small as possible. From the result above, we can see that the Significance F is smaller than any of the commonly used significance levels. (1%,5% or 10%). It means that the linear regression model built is suitable for the population.

Table 8. Regression Result

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.006415725	0.002782621	2.305641087	0.023195853	0.000895084	0.011936365
COVID fear index	-0.025954298	0.011348676	-2.28698895	0.024303971	-0.048469749	-0.003438847
Delta New cases	-2.48841E-10	6.71268E-0.8	-0.00370703	0.997049606	-0.000000133427	0.00000013293
Delta GEPU	-0.000275965	6.99711E-0.5	-3.94398619	0.000148871	-0.000414786	-0.000137144

Because the P-Value of Delta New Case is greater than 0.05, this variable is statistically insignificant. This is consistent with our previous test results. The P-value of COVID Fear Index and Delta GEPU are both less than 0.05, these variables are statistically significant.

Based on the result, we can conclude that two variables COVID Fear Index and Delta GEPU has a statistically significant effect on the market return. The COVID Fear Index coefficient = -0.0259, this coefficient represents if COVID Fear Index increases by 1 unit, the market return decrease by 0.0259. An increase in COVID-19 fear has a negative relationship with the market return.

5. Conclusion

The result shows that the correlation of the COVID-19 fear index has a negative relationship with the cumulative market returns and is consistent with the original paper. In this research, the correlation between COVID Fear Index and market returns is - 0.264 (which p-value is 0.00674 < 0.05 statistically significant) compared with -0.880 (p-value is 0.373 at 5% significance level) in the original. Besides, our search findings that the correlation between Delta GEPU and market returns is negative -0.3905 (which p-value is 0.00004 < 0.05 statistically significant) compared with -0.02 (p-value is 0.008 at 5% significance level). Because the P-Value of Delta New Case= 0.997 > 0.05. Its mean this variable is statistically insignificant. In this research, we also conduct the result that the Vietnamese stock return is negative (-0.0264 at 5% significance level) which qualitatively similar to those of these countries and provides evidence of the negative market reaction caused by the pandemic fear.

In this study, we investigate the impact of COVID-19 fear Index on the stock market returns: Evidence from Vietnam. To create a unique COVID-19 fear index, we base on the Search Volume Index (SVI) from Google Trends to search keywords connected to COVID-19 words and phrases as reported by Google and many Internet dictionaries. During this epidemic, the COVID-19 fear index is performed as a representative to gauge the sentiment of retail investors. The stock market return of VN-Index was considered to identify the impact of COVID-19 fear on this field. Our research findings imply that COVID-19 fear has a negative influence on stock returns. These findings are clear and consistent with the behavioral school of thought, which implies that excessive pessimism among investors can have a long-term influence on stock prices.

The drawback of this study is the terms to obtain the research volume index is quite small, so it does not show obviously the COVID-fear Index in detail. In addition, this study employs the GEPU to conduct and conclude in the case of Vietnam. Because Global EPU is a possible indicator represent to reflect instability in the main global economy as it is represented most of the developed countries in the world. Therefore, the result may not express exactly the volatility of stock prices in Vietnam's stock market.

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