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U.S. stock market under COVID-19-related uncertainty

Ibraheem Monday Ojelade[1]
Department of Compute Science, Austin Peay State University, Clarksville, Tennessee,
United State.
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Abstract

This study examines the impact of COVID-19-related uncertainty on U.S. stock returns over different market conditions. This research addresses its objective using three variants of the uncertainty index, namely the EMV-ID uncertainty index, the composite COVID-19 news-and-macro-based uncertainty index (CNMI), and the new measure of the COVID-19 news-based uncertainty index (UNC). The study further applies quantile regression to examine the effect of the COVID-19-related uncertainty indices on the conditional quantile distribution of the stock returns over nine quantiles ranging from 10th to 90th tails. The findings of the study reveal evidence of a positive effect of uncertainty on stock returns during the bearish market condition, while a negative impact is recorded in the bullish market condition when the composite COVID-19 news-and macro-based uncertainty index (CNMI) was adopted. Meanwhile, the results from the estimations using the EMV-ID uncertainty index and COVID-19 New-based uncertainty index (UNC) suggest a negative and significant effect of uncertainty during the bearish period and a significant positive impact on the U.S. stock returns during the bullish market condition. The findings of the study offer relevant policy implications for investors in the stock market as well as policy-makers.

Keywords: COVID-19-related uncertainty; U.S. stock returns; Quantile regression; EMV-ID uncertainty index.

JEL codes: C32; E44; G15; G18

1. Introduction

While uncertainty is not new to the global economy, the emergence of the COVID-19 pandemic features a new wave of severe uncertainty which melts down the entire world economic activity. The virus's continued spread resulted in the closure of businesses, restrictions on movement, and travel bans as a result of the implementation of several policy responses to mitigate its effects (Badmus & Ojelade, 2022).These policy interventions were in fact the agents of the COVID-19-related uncertainty because, in the presence of these measures such as international border closures and lockdown policies, organizations were unable to actively carry out their activities as before, leading to a decline in investment, trade, and economic growth (Badmus et al., 2022). Thus, the emergence of panic, fear, and sentiments among financial investors across the globe.

The stock market is equally affected by the COVID-19 pandemic and its related uncertainty, which fuels different economic issues. There are several reasons to think that the pandemic-related uncertainty affected the stock market. First, the occurrence of the virus prompted global leaders and institutions to devise several responses to stabilize the world economy, which consequently led to uncertainty in economic policies. Meanwhile, during periods of economic policy uncertainty (EPU), stock markets are found to perform poorly because the situation intensifies sentiments among financial investors, causing them to want to sell their tradable assets (Huang & Liu, 2022). Second, the pandemic disorganized the global supply chain and prices of global commodities such as crude oil and assets like stocks, bonds, etc. were adversely affected, resulting in a decline in returns for investors (Narayan et al., 2021a; Lawal et al., 2020). Third, the continuous growth in the recorded rate of fatalities and the inability to accurately define or predict the end of the virus marked a significant factor that brought fear and uncertainty to the stock market because investors were uncertain about the future prosperity of their assets in the presence of the turbulent period.

Empirically, there is a good number of papers on the role of uncertainty in stock market performance. From the standpoint of uncertainty due to economic policy, studies including Guo et al. (2018) and Huang and Liu (2022) argue that the presence of EPU adversely affects asset returns of the stock markets in the G7 and BRICS countries. Meanwhile, Chiang (2022) acknowledges that the U.S. EPU negatively affects the country's stock market as well as other global stock indices. Similarly, Behera and Rath (2021) establish the presence of connectedness between G7 stock market volatility and Twitter-related uncertainty, with the asset returns of these markets being the net receivers of the global uncertainty shock. Also, a study by Ma et al. (2022) on EPU's effect on stock market volatility in the G7 countries demonstrates the presence of an adverse relationship, particularly at the early stage of important economic crises such as the global financial crisis.

Despite increasing evidence on the link between uncertainty and the stock market, the role of COVID-19-related uncertainty on stock returns has yet to be examined; thus, this study attempts to fill this gap. In particular, it examines the impact of the COVID-19-related uncertainty on the U.S. stock market. Also, it analyzes the link between the COVID-19-related uncertainty and the U.S. stock market using three variants of the uncertainty indicator, namely the newly constructed news-based uncertainty index due to infectious disease and pandemic by Baker et al. (2020), the composite COVID-19 news-and macro-based uncertainty index developed by Salisu et al. (2021), and the new measure of the COVID-19 new-based uncertainty index proposed by Narayan et al. (2021b). Additionally, the study fits the model for the impact of the COVID-19 pandemic-related uncertainty on U.S. stock returns using the quantile regression technique to express the relationship over different market conditions. This technique proves worthwhile in analyzing the dynamic nexus between the COVID-19-related uncertainty indicators and stock returns in the bearish, normal, and bullish market conditions during the COVID-19 pandemic. This empirical examination is closely related to the studies of Guo et al. (2018) and Huang and Liu (2021) on the connection between uncertainty and stock market performance. However, these studies focus on uncertainty due to economic policy rather than the COVID-19 pandemic-induced uncertainty. Thus, this current research offers insightful findings on the implications of the COVID-19-related uncertainty on U.S. stock returns in the pandemic era.

The concluding parts of this article are divided as follows: Section 2 entails the data description and empirical method; Section 3 presents the results and discusses the findings; and Section 4 entails the conclusion of the study.

2. Methodology

2.1 Data Description

The study investigates the relationship between COVID-19-related uncertainty and US stock returns (SR) using daily S&P 500 Composite prices obtained from https://www.investing.com. The uncertainty indices include the newly constructed news-based uncertainty index due to infectious disease and pandemic (EMV-ID) by Baker et al. (2020) gathered from https://www.policyuncertainty.com/infectious_EMV.html, the composite COVID-19 News- and Macro-based uncertainty index (CNMI) developed by Salisu et al. (2021), and the new measure of COVID-19 New-based uncertainty index (UNC) proposed by Narayan et al. (2021b). In addition, it sourced the crude oil price (proxied by WTI crude oil prices) as a control variable received from the U.S. Energy Information Administration (EIA) via https://www.eia.gov/. The data collected covers the period between March 11, 2020 and December 31, 2021, where the start date is marked by the announcement of the coronavirus as a global pandemic by the WHO, while the end period is primarily due to data availability for the varieties of uncertainty index used in the study.

Table 1 presents the summary statistics detailing the descriptive statistics and the unit root test results. In the upper panel, it reveals that the stock and crude oil returns have a positive sign, suggesting that the returns on these assets increased on an average scale over the sampled period. While the means of the uncertainty indices are also positive, the CNMI has the highest mean value, followed by the UNC and EMV-ID. Furthermore, the standard deviation values suggest evidence of the huge dispersion of the series from their mean values. Meanwhile, the Jacque-Bera statistics for normality assumption are highly significant, confirming the rejection of the null hypothesis of normal distribution in the series. The unit root results based on the ADF and DF-GLS tests suggest the rejection of the null hypothesis of non-stationary movement in the series at the level and first difference cases except for SR, which is non-stationary at the level for the DF-GLS test.

In addition, the study provides the trends in the COVID-19-related uncertainty indices and the U.S. stock returns in Fig. 1. Evidently, the stock return series is highly susceptible to changes, particularly at the early stage of the COVID-19 pandemic declaration. Meanwhile, while the EMV-ID and COVID-19 news-based uncertainty indicators are highly susceptible to decline as the pandemic continues, the rate of uncertainty due to the COVID-19 news- and macro-based index continues to rise. These series show such patterns because while the pandemic-related news creates uncertainty in the early periods, people are less sensitive to the news as the pandemic dies out. However, its adverse effect on the macroeconomic indicators continues to amplify, which aggravates the news-and-macro-based uncertainty index.

Table 1: Summary Statistics

Descriptive Statistics					
	Mean	Maximum	Minimum	Std. Dev.	Jacque Bera
SR	0.0011	0.0897	-0.1277	0.0162	5829.2040***
WTIR	0.0034	0.4258	-0.2749	0.0503	11269.4800***
CNMI	59.4405	73.5224	1.5070	10.4193	1360.8680***
EMV-ID	16.5685	68.3700	1.1100	10.6876	334.6679***
UNC	46.1243	100.0000	0.5269	17.1068	17.8306***
Unit Root Tests					
	ADF		**DF-GLS**		
	Level	First Difference	Level	First Difference	
SR	-30.6449***	-56.4770***	-1.5137	-4.5439***	
WTIR	-20.5590***	-34.8080***	-2.8186*	-16.8399***	
CNMI	-5.4970***	-20.9180***	-6.3337***	-8.9856***	
EMV-ID	-10.8780***	-33.9560***	-9.9658***	-14.4516***	
UNC	-23.0590***	-43.5680***	-4.4769***	-27.9858***	

*** and * denote statistical significance at 1% & 10%, respectively.

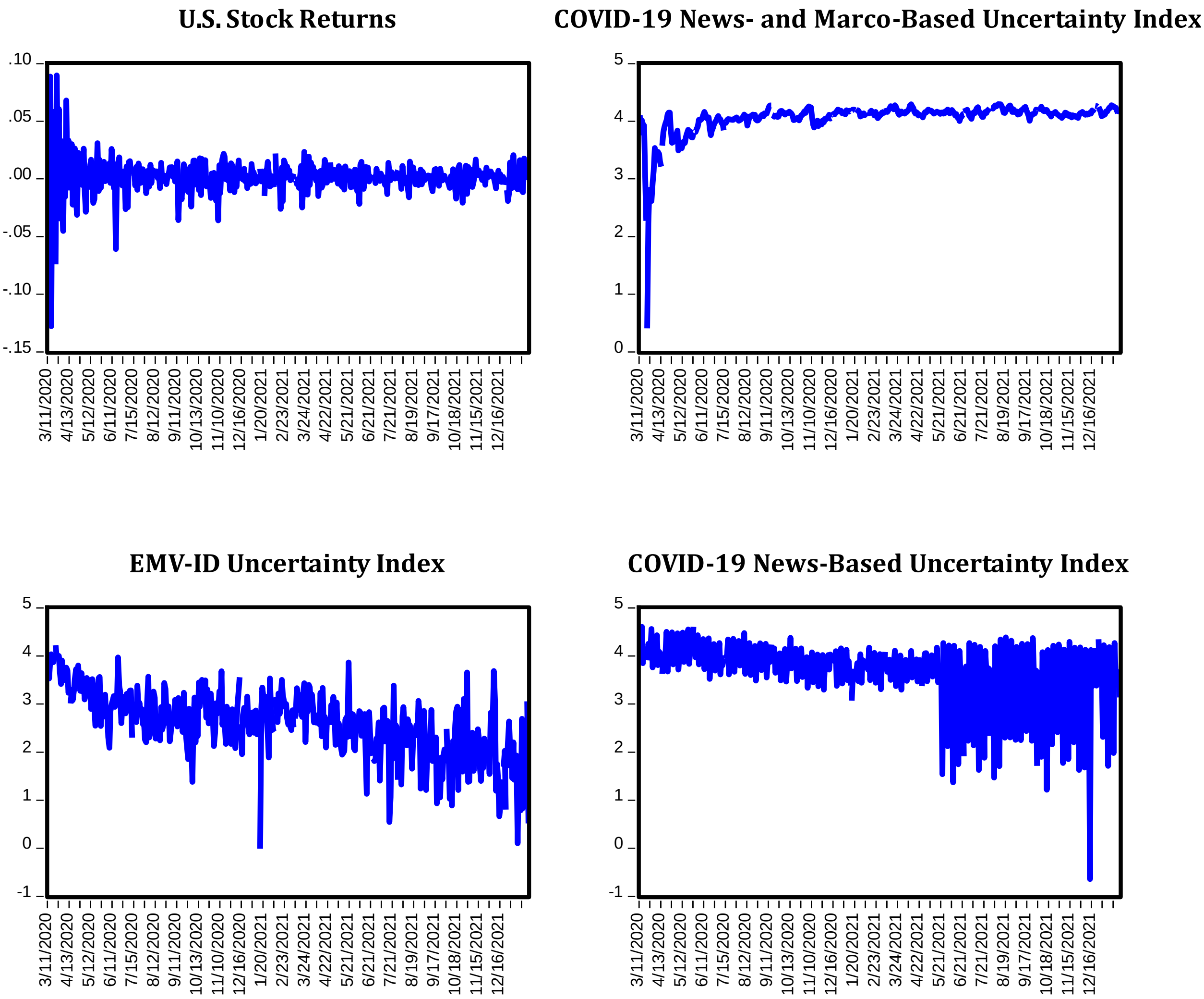

Fig. 1: Trends in U.S. stock returns and COVID-19-related uncertainty indices

2.2 Empirical Model

In this study, the quantile regression proposed and designed by Koenker and Bassett (1978) is applied to the empirical investigation of the COVID-19-related uncertainty and the U.S. stock return nexus. This technique analyzes the conditional heterogeneity nexus between the variables of interest such that the impact of the regressors in expressing the quantile distribution of the dependent variable is analyzed. As an extension of the standard ordinary least squares technique, it is superior to the OLS because the OLS only provides information about the impact of vectors of independent variables on the conditional mean of the dependent variable (Nusair & Al-Khasawneh, 2017). Meanwhile, quantile regression helps to assess the dynamic relationship between the regressors and the regressand based on the conditional quantile distribution of the dependent variable. Therefore, reporting information about the entire conditional distribution of the dependent variable rather than the average effects which may be prone to under-or overestimation of the important coefficient parameters (Nusair & Al-Khasawneh, 2017). Additionally, the quantile regression is also applicable for robust outcomes when the series under examination has specific data characteristics such as non-normality, heterogeneity, skewness, and outliers in the dependent variable (Zhu et al., 2016).

For the purpose of this study, the empirical model follows the model prescribed by Narayan et al. (2021a), Narayan et al. (2022), and Huang and Liu (2021). Thus, the model is first stated in the standard OLS version as follows;

$$SR_t = \beta_0 + \beta_1 SR_{t-1} + \beta_2 VOL_t + \beta_3 WTIR_t + \beta_4 UNCERTAINTY_t + \varepsilon_t \qquad (1)$$

where SR_t is the stock returns computed as the first difference of the natural logarithm of the S&P 500 composite index ($SR_t = In(S\&P\ 500\ Composite_t / S\&P\ 500\ Composite_{t-1}) * 100$), SR_{t-1} is the one-time lagged stock returns, VOL_t is the stock returns volatility computed based on the variance generated from a GARCH(1,1) model, $WTIR_t$ is the WTI crude oil price returns, $UNCERTAINTY_t$ is the COVID-19-related uncertainty index measured by EMV-ID, CNMI, and UNC while ε_t is the stochastic error term. Equation (1) therefore describes the relationship between the COVID-19-related uncertainty and the U.S. stock returns with the standard OLS framework. However, to analyze this model over the conditional quantile distribution of the dependent variable and over different market conditions, a quantile regression is developed.

To begin with, the quantile regression describes the conditional quantile (τth) of the dependent variable for a given set of explanatory variables for some value of $\tau \in (0,1)$. Hence, the equation is restated in a conditional quantile model for SR_t given the vectors of the explanatory variables X_t, as follows;

$$Q_{SR_t}(\tau | x_t) = \alpha^\tau + x_t' \beta^\tau \qquad (2)$$

where $Q_{SR_t}(\tau | x_t)$ is defined as the conditional quantile τth of the dependent variable SR_t, α^τ is the constant element of the model which depend on τ, x_t' represent the vectors of regressors expressed in equation (1) over τth quantile distribution while β^τ denotes the vector of parameters associated with the exogeneous variables. According to Koenker and Bassett (1978), the resulting coefficients of the τth quantile of the conditional distribution of the model are computed based on the minimization problem defined as follows;

$$\min_{\beta \in \mathbb{R}^k} \left[\sum_{t: SR_t \geq \alpha^\tau + x_t'\beta^\tau} \tau |SR_t - \alpha^\tau - x_t'\beta^\tau| + \sum_{t: SR_t < \alpha^\tau + x_t'\beta^\tau} (1-\tau) |SR_t - \alpha^\tau - x_t'\beta^\tau| \right] \qquad (3)$$

which is generated as a solution from the minimization of the weighted deviations from the conditional quantile

$$\min_{\beta \in \mathbb{R}^k} \sum_t \rho_\tau (SR_t - \alpha^\tau - x_t'\beta^\tau) \qquad (4)$$

where ρ_τ is known as the weighting factor used as a check function to define the distribution of any $\tau \in (0,1)$ as follows;

$$\rho_\tau(\xi_t) = \begin{cases} \tau\xi_t, & if\ \xi_t \geq 0 \\ (\tau - 1)\xi_t, & if\ \xi_t < 0 \end{cases} \quad (5)$$

Such that $\xi_t = SR_t - \alpha^\tau - x_t'\beta^\tau$. Therefore, the quantile regression now becomes a weighted regression that allows different weighting scales at any data point depending on the choice of points determined to be the best fit for the model. Additionally, the weighted version minimizes the sum of residuals, which allows positive residuals to be weighted as τ while negative residuals are identified as $1 - \tau$.

While recognizing the minimized version of the quantile regression, the dynamic effect of the COVID-19-related uncertainty on U.S. stock returns can be expressed in a full specification as follows;

$$Q_{SR_t}(\tau|x_t) = \alpha_0^\tau + \alpha_1^\tau SR_{t-1} + \alpha_2^\tau VOL_t + \alpha_3^\tau WTIR_t + \alpha_4^\tau UNCERTAINTY_t + \varepsilon_t \quad (6)$$

In the estimation of the model, the quantile regression in equation (6) is estimated over nine consecutive quantiles ($\tau = 0.1, 0.2, 0.3, \dots, 0.9$) and the quantile distribution is further divided into 3 different market conditions, namely bearish market ($\tau = 0.1, 0.2, 0.3$), normal market ($\tau = 0.4, 0.5, 0.6$) and bullish market ($\tau = 0.7, 0.8, 0.9$).

3. Results and Discussion of Findings

This section presents the main results of the study using the quantile regression technique, which assesses the relationship between the COVID-19-related uncertainty and the U.S. stock returns over different market conditions, namely bearish, normal, and bullish. Because the indices of the COVID-19-related uncertainty are three, the results are prepared in three different tables for clarification. First, the results for the U.S. stock returns and COVID-19 news- and macro-based uncertainty index are reported in Table 2, followed by the EMV-ID Uncertainty Index estimations in Table 3 and finally, Table 4 contains the COVID-19 news-based uncertainty index results.

In Table 2, the results show that the effect of the COVID-19-related uncertainty on U.S. stock returns is heterogeneous across different market conditions. In the bearish market period, it is evident that the COVID-19 News-and Macro-Based uncertainty index significantly and positively influences stock returns at the 10th and 20th quantiles, while the positive effect is not significant at the 30th quantile. Meanwhile, a significant adverse influence of the COVID-19 News-and Macro-Based uncertainty index is only recorded on the stock returns in the U.S. at the 60th quantile of the normal market. However, the bullish market reveals a negative and significant impact of the COVID-19 News-and Macro-Based uncertainty index on the stock returns for all quantile points. The results during bearish market conditions imply that the stock market is not badly affected by the uncertainty induced by the COVID-19 news- and macro-based factors since positive returns are recorded in the period. Meanwhile, the returns of the stock market are negatively affected during the bullish market due to evidence of a negative influence of the COVID-19 News-and Macro-Based uncertainty index on the U.S. stock returns. While the findings contradict the general expectation that uncertainty negatively affects and positively influences stock returns in bearish and bullish markets, respectively, as suggested by Guo et al. (2018), the implication of the findings is that investors were able to earn good returns on their assets during the early periods of bad news of uncertainty in the market, but their returns were negatively affected at the extreme tails of the bullish market. In another study by Chiang (2020), the author reports that the effect of global EPU on U.S. stock returns is negative, but the lagged EPU effect is found to be positively related to stock returns in the country.

Table 2: Results for U.S. Stock Returns and COVID-19 News and Macro-Based Uncertainty Index

Bearish market			
Variables	**τ =0.1**	**τ =0.2**	**τ =0.3**
SR_{t-1}	0.0481 [0.1163]	-0.0380[0.1134]	-0.1919**[0.0856]
VOL_t	-11.7335 [7.9347]	-11.4783[7.5158]	-3.4754[6.8553]
$WTIR_t$	0.0002*** [0.0001]	0.0002***[0.0001]	0.0002***[0.0001]
$CNMI_t$	0.0168** [0.0083]	0.0168**[0.0078]	0.0049[0.0068]
CONS	-0.0858** [0.0363]	-0.0797**[0.0333]	-0.0266[0.0291]
Normal market			
Variables	**τ =0.4**	**τ =0.5**	**τ =0.6**
SR_{t-1}	-0.2457***[0.0751]	-0.2502***[0.0758]	-0.2369*** [0.0579]
VOL_t	-4.2885[7.1456]	-4.8093[6.8737]	2.1596[7.1151]
$WTIR_t$	0.0001***[0.00001]	0.0001***[0.00001]	0.0001***[0.00001]
$CNMI_t$	-0.0043[0.0107]	-0.0080[0.0105]	-0.0160**[0.0068]
CONS	0.0143[0.0449]	0.0318[0.0439]	0.0659**[0.0285]
Bullish market			
Variables	**τ =0.7**	**τ =0.8**	**τ =0.9**
SR_{t-1}	-0.2030***[0.0467]	-0.2646***[0.0605]	-0.2338*** [0.0615]
VOL_t	2.3510[6.4282]	5.1148[6.3710]	4.9800[6.1263]
$WTIR_t$	0.0001***[0.00001]	0.0001***[0.00001]	0.0002***[0.00001]
$CNMI_t$	-0.0172***[0.0064]	-0.0222***[0.0061]	-0.0324***[0.0066]
CONS	0.0737***[0.0267]	0.0959***[0.0257]	0.1408***[0.0278]

[.]= standard error, ***, **, and * respectively denote significance at 1%, 5% and 10%.

For the estimation of the second COVID-19 pandemic-related uncertainty index measured by the EMV-ID uncertainty indicator in Table 3, the results are also heterogeneous but differ from the findings of the COVID-19 news- and macro-based uncertainty index analyses. Unlike the previous results, the effect of the EMV-ID uncertainty index is negative during bearish market conditions but positive from the extreme tail of the normal market to the end tail of the bullish market, implying that US stock returns are positively affected during normal and bullish market conditions but negatively affected during bearish market conditions.This conforms with the expected findings that bad news in the stock market brings about poor performance of assets due to the inability to accurately predict the direction of future returns of stock prices. Evidently, the economic uncertainty due to equity market volatility and infectious diseases index influences the U.S. stock market returns in a way that conforms to the findings of Guo et al. (2018) that the effect is negative during the bearish market while the bullish market profits the investors due to the positive impact of uncertainty on the stock returns.

Table 3: Results for U.S. Stock Returns and EMV-ID Uncertainty Index

Bearish market			
Variables	**τ =0.1**	**τ =0.2**	**τ =0.3**
SR_{t-1}	-0.1470[0.1635]	-0.1341[0.1152]	-0.1735[0.1194]
VOL_t	-9.6436[7.5141]	-10.5253[7.0413]	3.7986[7.0798]
$WTIR_t$	0.0003***[0.00001]	0.0002***[0.00001]	0.0002***[0.00001]
EMV_t	-0.0039**[0.0015]	-0.0028**[0.0012]	-0.0015[0.0011]
CONS	-0.0078**[0.0036]	-0.0030[0.0033]	-0.0033[0.0032]
Normal market			
Variables	**τ =0.4**	**τ =0.5**	**τ =0.6**
SR_{t-1}	-0.2402**[0.1128]	-0.2640***[0.0920]	-0.2067**[0.0806]
VOL_t	-3.8465[6.3514]	-4.0482[5.4643]	2.5557[5.6859]
$WTIR_t$	0.0001***[0.00001]	0.0001***[0.00001]	0.0001***[0.00001]
EMV_t	-0.0004[0.0009]	0.0004[0.0010]	0.0016**[0.0008]
CONS	-0.0029[0.0024]	-0.0023[0.0028]	-0.0032*[0.0018]
Bullish market			
Variables	**τ =0.7**	**τ =0.8**	**τ =0.9**
SR_{t-1}	-0.1773***[0.0614]	-0.1695**[0.0723]	-0.0649[0.0956]
VOL_t	2.7569[3.5427]	5.9909[3.7008]	6.3115**[3.0725]
$WTIR_t$	0.0002***[0.00001]	0.0002***[0.00001]	0.0001**[0.00001]
EMV_t	0.0016*[0.0009]	0.0022*[0.0013]	0.0044***[0.0016]
CONS	-0.0021[0.0021]	-0.0017[0.0023]	-0.0016[0.0028]

[.]= standard error, ***, **, and * respectively denote significance at 1%, 5% and 10%.

In Table 4, the effect of the COVID-19 New-based uncertainty index on the U.S. stock returns is reported for different bearish, normal, and bullish market conditions. While the effect of the COVID-19 New-based uncertainty index on the U.S. stock returns is heterogeneous across the market conditions, the estimates are statistically significant but similar to the estimates of the EMV-ID uncertainty index results. Specifically, the bearish market constitutes negative estimates showing a decline in stock returns as a result of the COVID-19 new-based uncertainty. Meanwhile, the stock market favors investors at the extreme tail of normal market conditions following evidence of negative impact for 40th and 50th quantiles estimates and positive coefficients for the 60th quantile. However, the estimates for the bullish market period show that the COVID-19 new-based uncertainty index has a negative effect on the US stock return in the early tail but turns positive in the 80th and 90th quantile distributions, implying that bad news due to economic uncertainty caused by the COVID-19 pandemic does not significantly promote positive returns in the stock market.

Table 4: Results for U.S. Stock Returns and COVID-19 News-Based Uncertainty Index

Bearish market			
Variables	**τ =0.1**	**τ =0.2**	**τ =0.3**
SR_{t-1}	-0.1154[0.0809]	-0.1402[0.0962]	-0.2003**[0.1003]
VOL_t	-10.4728[7.1295]	-10.8559[7.0705]	-3.8534[7.2982]
$WTIR_t$	0.0002***[0.00001]	0.0001**[0.00001]	0.0001***[0.00001]
UNC_t	-0.0026[0.0017]	-0.0018[0.0012]	-0.0003[0.0013]
CONS	-0.0079[0.0052]	-0.0029[0.0054]	-0.0056[0.0060]
Normal market			
Variables	**τ =0.4**	**τ =0.5**	**τ =0.6**
SR_{t-1}	-0.2303**[0.0942]	-0.2813***[0.0875]	-0.2362***[0.0643]
VOL_t	-3.9044[6.7470]	-3.8477[5.3974]	2.4026[5.2317]
$WTIR_t$	0.0001***[0.00001]	0.0001***[0.0001]	0.0002***[0.00001]
UNC_t	-0.0012[0.0012]	-0.0007[0.0010]	0.0002[0.0009]
CONS	0.0008[0.0050]	0.0010[0.0042]	-0.0006[0.0038]
Bullish market			
Variables	**τ =0.7**	**τ =0.8**	**τ =0.9**
SR_{t-1}	-0.1865***[0.0504]	-0.1685***[0.0383]	-0.1027**[0.0474]
VOL_t	2.8921[4.8374]	6.2732[4.9816]	6.5054[5.0007]
$WTIR_t$	0.0002***[0.00001]	0.0002***[0.00001]	0.0002***[0.00001]
UNC_t	-0.0002[0.0006]	0.0001[0.0007]	0.0010[0.0009]
CONS	0.0027[0.0026]	0.0032[0.0027]	0.0030[0.0030]

[.]= standard error, ***, **, and * respectively denote significance at 1%, 5% and 10%.

In addition to the statistical estimates of the quantile regression, the study reports the graphical estimates of the estimated model. The results are presented in Figs. 2 to 4. The charts report both OLS estimates and quantile regression coefficients. The OLS estimates present the conditional mean effect reported by the dashed lines with dotted lines that represents the 95 percent confidence interval, which do not vary. Meanwhile, the estimates of the quantile regression are reported for the quantile distribution over different market conditions, namely bearish market ($\tau = 0.1, 0.2, 0.3$), normal market ($\tau = 0.4, 0.5, 0.6$) and bullish market ($\tau = 0.7, 0.8, 0.9$) by black solid lines with shaded lines for the 95 percent confidence interval. As seen in the charts, the quantile regression estimates for the three estimated models reveal that the effect of the COVID-19-related uncertainty on U.S. stock returns varies across the quantile distribution, suggesting that the effect of uncertainty is not stagnant but changes over time and across different market conditions.

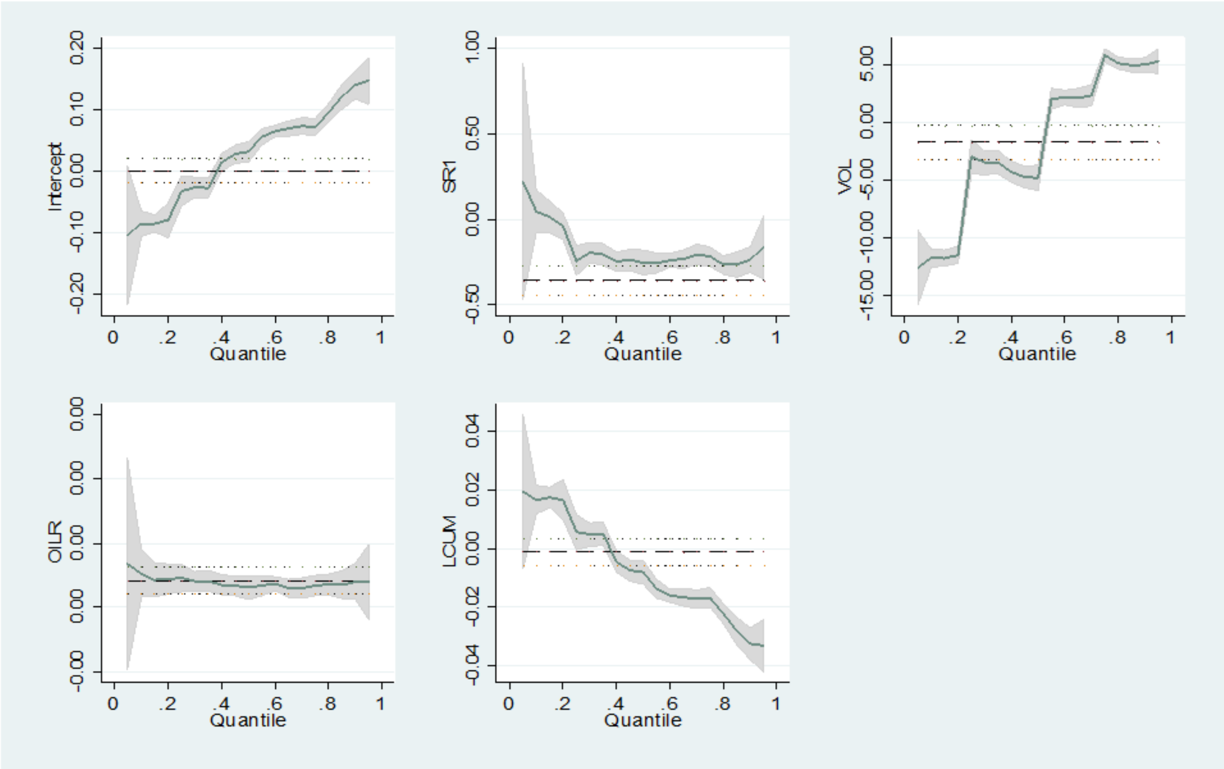

Fig. 2: Quantile coefficients for U.S. stock returns and COVID-19 News and Macro-Based Uncertainty Index

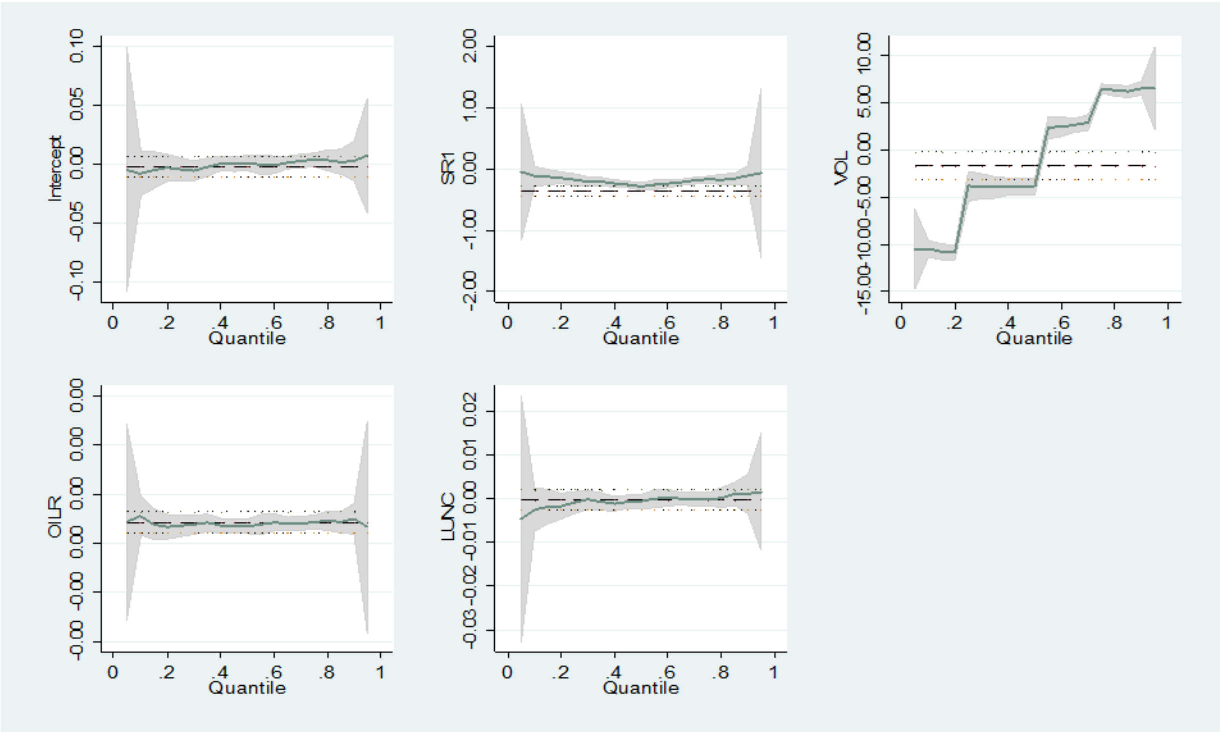

Fig. 3: Quantile coefficients for U.S. stock returns and COVID-19 News-Based Uncertainty Index

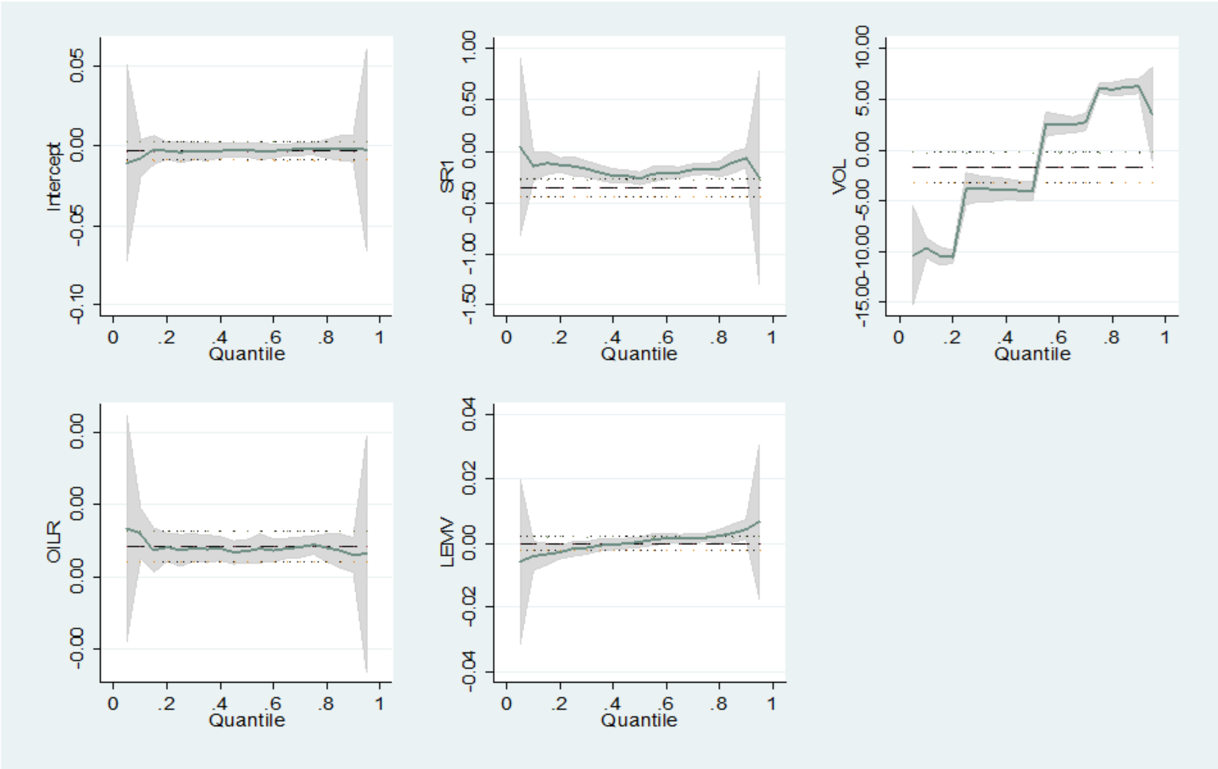

Fig. 4: Quantile coefficients for U.S. stock returns and EMV-ID Uncertainty Index

4. Conclusion

In the wake of the unprecedented emergence of the deadly COVID-19 pandemic, the global economy has been adversely affected as the fatality toll of the virus increases. Consequently, the global supply chains were affected and prices of essential commodities and assets such as crude oil and stocks hit historic lows, leading to the stock market crash of 2020. This event birthed severe uncertainty in the U.S. stock market which motivated the investigation of the impact of the COVID-19-related uncertainty on the U.S. stock returns. To achieve this objective, the study applies three variants of the COVID-19-related uncertainty index to the U.S. S&P 500 composite index price returns for a period between the date of the COVID-19 declaration as a pandemic, March 11, 2020, and December 31, 2021. The indicators of uncertainty include the newly designed news-based uncertainty index due to infectious disease and pandemic (EMV-ID) by Baker et al. (2020) gathered from https://www.policyuncertainty.com/infectious _EMV.html, the composite COVID-19 News- and Macro-based uncertainty index (CNMI) developed by Salisu et al. (2021), and the new measure of COVID-19 New-based uncertainty index (UNC) proposed by Narayan et al. (2021b). Furthermore, the dynamic relationship between uncertainty induced by the COVID-19 pandemic and U.S. stock returns is examined using the quantile regression technique to assess the effect of uncertainty over the bearish, normal, and bullish market conditions.

The results from the empirical analysis of the study suggest a heterogenous effect of the COVID-19-related uncertainty indices on the U.S. stock returns over different market conditions. The findings suggest evidence of a positive effect of uncertainty on stock returns during the bearish market condition, while a negative impact is recorded in the bullish market condition when the composite COVID-19 news-and macro-based uncertainty index (CNMI) was adopted. Meanwhile, the results from the estimations using the newly constructed news-based uncertainty index due to infectious disease and pandemic (EMV-ID) suggest a negative and significant effect of uncertainty during the bearish period and a significant positive impact on the U.S. stock returns during the bullish market condition. This finding is also similar to the results of the estimated model for the new measure of the COVID-19 New-based uncertainty index (UNC). However, the estimates of the uncertainty index are not significantly related to the U.S. stock returns.

The findings of the study have relevant policy implications. First, the examination of the nexus between uncertainty and stock returns seems to be conditionally dependent on the quantile distribution of the stock returns. Thus, the estimation of such a model using the OLS approach may not be appropriate to address policy issues related to the reaction of stock returns to uncertainty induced by the COVID-19 pandemic. Second, the findings suggest that the effect of the COVID-19 pandemic-induced uncertainty on stock returns varies across different market conditions; thus, financial investors in the stock markets need to devise appropriate asset management and portfolio diversification in the post-pandemic era to acquire profitable gains in the market. Third, policy-makers as well as investors should avoid the speculation of asset returns without adequate information about the current market condition because the prediction of stock returns in the bearish period differs from the expected gains during the bullish era. Thus, policy-makers and investors should gather adequate information related to stock market performance before making portfolio decisions, particularly during the bearish market condition.

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