Covid-19 pandemic and stock returns volatility: Evidence from Vietnam's stock market

Nguyen Thi My Linh[1*]

[1]University of Finance - Marketing, Ho Chi Minh City, Vietnam
[*]Corresponding author: nguyenlinh@ufm.edu.vn

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ABSTRACT

The Covid-19 global pandemic has caused trouble for labour and financial markets worldwide, and financial and health crises resulted. This makes policy makers get confused. The study is carried out with the aim of investigating the impacts of Covid-19 on both the mean and the conditional volatility of the Vietnamese stock market returns, using a simple the Generalized Autoregressive Conditionally Heteroskedastic (GARCH) model, spanning the period 01 January 2020 to 30 July 2021. The confirmed case and deaths growth rate are used as two proxies for the Covid-19 pandemic. The empirical evidence reveals that higher confirmed cases growth rate lead to a decrease in stock returns. It is also noted that stock returns volatility is affected positively and significantly by confirmed cases growth rate. This empirical evidence may prove informative for policy makers and investors.

1. Introduction

The volatility of stock returns has been studied widely both in theory and empirical evidence. According to theory related to stock markets, volatility is the level of uncertainty that could be extremely or risky associated with the value of financial assets (Engle & Patton, 2007). The volatility of stock returns could be stimulated by investors and their awareness of daily information in the financial market. However, the volatility has not been researched widely in Vietnam in the context of the unprecedented Covid-19 pandemic. Fernandez-Perez, Gilbert, Indriawan, and Nguyen (2021) supposed that the Covid-19 outbreak has caused severe loss of life and continues to cause damage to the global economy. Notably, Eleftheriou and Patsoulis (2020) argued that Covid-19 has caused an unprecedented wave of economic uncertainty in stock markets around the globe. Indeed, Covid-19 is supposed as an unprecedented event, policy makers all over the world have responded to the pandemic with lots of confinement measures including workplace closings, limiting residential movement, lockdowns, testing and quarantining, social distancing, and vaccination program. These actions serve the purpose of ensuring social distancing among people and curbing the spread of the disease, whereas trying to minimize adverse economic impacts and stabilize financial markets. However, the effectiveness and impact of these actions are uncertain. For example, lockdown solutions, although could be helpful in lowering the number of new infections, they cause a greater economic gap among people, as well as hurt the job opportunities and incomes of workers afterward. In Vietnam, the first recorded case of Covid-19 was reported in January, 2020. Since then, the financial markets have responded to the pandemic with dramatic movements. VN-Index fell from 960.99 points at the end of 2019 to 656 points at the end of March 2020 - the worst drop in the past three years. However, the market had a remarkable recovery to 1,097.54 points at the end of December 2020, increase by 14% compared to the same period last year. At the beginning of 2021, the VN-Index continued its uptrend. As of July 30, 2021, it reached 1,310.05 points. This problem gives rise to a new important question, which could clarify the general direction of financial market movements in Vietnam, whether the recent Covid-19 pandemic is the cause of adverse effects on stock market returns and their associated volatility. Therefore, the aim of this paper is to investigate the effect of Covid-19 on stock market returns and their volatility over the period from 31 January 2020 through 30 July 2021 in Vietnam, by employing the GARCH technique. Stock market pooling of sophisticated and judicious investors incentivizes expected future empirical investigation. Wagner (2020) argued that stock markets supply particularly helpful information in expeditious changeable situations. A shock as impactful as Covid-19, would bring impacts that need to be measured. Al-Awadhi, Alsaifi, Al-Awadhi, and Alhammadi (2020), Ashraf (2020), Baker, Bloom, Davis, and Terry (2020), Zhang, Hu, and Ji (2020) reported that stock markets around the world have reacted to Covid-19 pandemic with strong negative returns. Despite the fact that the effect of Covid-19 has not been taken into account broadly in the research for Vietnam stock markets, the findings of this study indicate that confirmed cases growth rate has a negative effect on stock returns and causes stock volatility increase in Vietnam. They strengthen the theoretical basis for the influence of the Covid-19 outbreak on market returns, bring some contribution to the policymakers' understanding with regard to shifting the focus of their policy towards lessening the Covid-19 risk, enhance the performance of the financial sector, and provide the behavior finance lessons for investors.

2. Theoretical basis

The theoretical framework for the relationship between Covid-19 and stock returns comes from the efficient market hypothesis developed by Fama (1965). A market is efficient if share prices reflect all provided information completely and rapidly. Information is not only limited to financial statements, but also covers political, social, and economic events, and other information. The efficient market principle examines how the market responds to information and affects stock prices. Fama (1965) described an efficient market as a market reflecting all provided information. An efficient market is one that responds quickly to attain a new equilibrium price that fully expresses the provided information. Therefore, in an efficient market, it is assumed that movements of share prices are unable to be forecasted by investors as the entry of information is by chance. The model with random walk is defined in Equation (1) as follows:

$$P_{t+1} = P_t + \varepsilon_{t+1} \tag{1}$$

Where,

P_{t+1}= share price at time t+1;

P_t= share price at time t;

ε_{t+1} = random error with zero mean and finite variance.

Equation (1) shows that the share price at time t+1 is equal to its price at time t plus a definite value that relies upon the arrival of unforeseeable information between two-time points, t and t+1. In other words, $\varepsilon_{t+1} = P_{t+1} - P_t$ does not depend on a change in the previous price.

When making investment decisions, investors use the information they have. Information in the stock market is affected by the condition of the environment, whether economic or not. As the economic and non-economic environment change, stock prices will alter to reflect those factors. The coronavirus disease 2019 outbreak shocked the world and triggered an unprecedented wave of uncertainty in real economies as well as in financial markets. Zaremba, Kizys, Aharon, and Demir (2020) argued that the novel coronavirus and government intervention in Covid-19 made quite an impact on stock market volatility through two feasible leading channels. The first "rational" channel is directly connected to portfolio restructuring. The Covid-19 pandemic and interventions signal alterations in future economic conditions, leading to modification of the company's cash-flow expectations and, in consequence, share prices. Sudden portfolio reconstructions - both within an asset class and among asset classes - may enhance volatility. The second "irrational" channel is related to behavioral nature. The deterioration in the macroeconomic conditions may result in "flights to safety" (Baele, Bekaert, Inghelbretch, & Wei, 2020), causing quick changes of portfolio flows and prices. In addition, the constant flow of policy-related news may result in news-implied volatility (Manela & Moreira, 2017) and a potential divergence of opinions leading to an increase in trading activity which also contributes to the growth of volatility.

On the background of the efficient market hypothesis and the transmission channels of Covid-19 to stock market volatility, many studies also have evaluated the effects of the growing Covid-19 epidemic on stock returns volatility within one country or with various cross-country dimensions. Given the dimension of this paper, limited papers with regard to the effect of the Covid-19 pandemic on stock returns are introduced. Zhang et al. (2020) provided a empirical evidence for the top ten nations having the highest number of reported cases as of 27 March 2020, in which the overall frameworks of country-specific risks and systematic risks were specified. Minimum spanning tree analysis was employed in the methodology, and their results showed that the financial market risks have risen considerably in response to the pandemic. Furthermore, the volatility in financial markets had been contributed by the unpredictability of Covid-19 and its adverse influence on the real economy. Al-Awadhi et al. (2020) investigated stock markets interacting with the Covid-19 outbreak in China, over an almost 3-month period, from 10 January 2020 to 16 March 2020. They used panel data analysis to examine the impact of Covid-19 on stock trade outcomes in both markets, Hang Seng and Shanghai stock exchanges. They found that higher daily in total confirmed cases and deaths generated a decrease in stock returns in China. Ashraf (2020) examined the stock markets' response to the Covid-19 pandemic by using daily Covid-19 number of confirmed cases, deaths, and stock market return data from six countries over the period 22 January 2020 to 17 April 2020. Their findings documented that stock markets outcomes responded negatively to the growth of confirmed cases. This means that stock market returns dropped as the number of confirmed cases escalated. The study confirmed that stock markets reacted more proactively to the growth in number of confirmed cases as compared to the growth in a number of deaths. The analysis also suggested that negative market reaction was strong during the early days of confirmed cases and then between 40 to 60 days after the initial confirmed cases. The study concluded that stock markets responded to Covid-19 pandemic rapidly and this response changes over time depending upon the stage of outbreak. Apergis and Apergis (2020) examined the potential impact of Covid-19 contagious disease on the Chinese stock market returns and their volatility using GARCHX model. The results documented that daily increases in total reported Covid-19 cases and deaths in China generates a decrease in stock returns. It is worth noting that such an effect was more noticeable when the total deaths were used as a proxy for the Covid-19 variable. The results also showed the postive effect of Covid-19 on the volatility of market returns on both stock exchanges. Malini (2020) investigated the impact of the Covid-19 pandemic towards six selected stock markets around the world (including USA, Indonesia, India, South Korea, Saudi Arabia, and Singapore). The result suggested that the Covid-19 pandemic was significantly associated with and exerted a significant impact on the behavior of stock return - in terms of volatilities and abnormal return - due to investors' reactions towards the shock. The Covid-19 can be categorized as a major shock due to the level of impact that it has created. As a result, this study provides the following two hypotheses (H1 and H2):

H1: The death growth rate leads to decline in stock market returns

H2: The confirmed cases growth rate leads to a decline in stock market returns

In addition, there are many possible determinants included in the model. After the research of Hamilton (1983) was carried out, there were numerous studies finding that stock markets had close association with and response to oil price shocks (Cologni & Manera, 2008; Kilian, 2009; Nguyen & Bhatti, 2012). Notably, Kilian (2009) proposed a model explaining the effect of oil price shock was contingent on whether the oil price movements are due to supply shocks or demand shocks. Several articles have used the model of Kilian (2009) to evaluate the effect of oil price shocks on financial markets thereafter. In general, the studies found that demand shocks had a stronger and more remarkable impact on stock returns than supply shocks. Oil prices were also included in the model of Basher, Haug, and Sadorsky (2012). By using the structural VAR model and through the impulse response analysis for the data from 1988 to 2008, the authors found that the shock to an increase in oil prices would drop the emerging market prices in the short run. Therefore, this research presents the following hypothesis (H3):

H3: The crude oil price growth rate leads to a decline in stock market returns

Moreover, the relationship between stock returns and exchange rates was aslo explored in numerous studies. The theoretical literature on the stock returns-exchange rate nexus was disscussed in "flow-oriented" exchange rate model developed by Dornbusch and Fisher (1980). The principal of these models is based on the impact of exchange rates on international competitiveness among countries. The flow on effect is on current accounts, which is reflected in the effects they have on real output and incomes. Stock prices respond to exchange rates as well because they account for present values of future cash flows, generated by the firm's operation. Besides the "flow-oriented" exchange rate model mentioned above, there are stock-oriented models of exchange rates, presented by Branson (1983) and Frankel (1983). These models supposed exchange rates as equating to supply and demand for assets. Given that asset valuation and pricing are contingent on the present values of future cash flows, exchange rates are directly related to asset prices. Empirical studies have concluded that there was a possible relationship between stock prices and exchange rates (Alagidede, Panagiotidis, & Zhang, 2011; Effiong, 2014; Fowowe, 2015). There are other previous studies using variations of the GARCH model to uncover volatility spillover transmission between these variables (Tule, Dogo, & Uzonwnanne, 2018; Zhao, 2010). However, the empirical evidence has not been consistent. This is because the relationship between stock prices and exchange rates is examined in the bivariate or multivariate framework using different econometric methods for different time periods, and for different economies. Narayan, Devpura, and Wang (2020) examined the relationship between the JapaneseYen and the Japan's stock returns during the Covid-19 period. Using several variants of econometric models and empirical methods, they indicate that the depreciation of the Yen related to the US dollar triggered off gains in Japanese stock returns. A one standard deviation depreciation of the Yen during the period of Covid-19 (equivalent to 0.588%) improved stock market returns by 71% of average returns. They found that this relationship was stronger over the Covid-19 period (January 2020 to August 2020) compared to the pre-crisis period. Recently, Dang, Le, Nguyen, and Tran (2020) provided evidence of the relationship between the exchange rate and stock price in Vietnam. Dang et al. (2020) used the NARDL modeling framework with monthly data from January 2001 to May 2018, and found that the exchange rate changes (both currency depreciation and appreciation) negatively affect stock prices in an asymmetric way. The above discussion leads to the null hypothesis (H4) as follows:

H4: The USD/VND growth rate leads to a decline in stock market returns

In summary, from the above studies, it can be seen that the relationship between the stock returns volatility and the Covid-19 event, oil price, and exchange rate. The studies in Vietnam have not yet examined the Covid-19 although these studies show some signs or evidence of the impact of exchange rates and oil prices on stock prices. Stemming from the research gap, this article aims to investigate the impact of Covid-19 on stock returns and its associated volatility in Vietnam market in the framework of GARCH methodology.

3. Methodology

In order to investigate the effects of Covid-19 on both the mean and the conditional volatility of the Vietnamese stock market returns, the study uses GARCH conditional volatility model. In Vietnam, the first confirmed case of nCov was reported on 23 January 2020. However, the stock market got back to work on 31 January 2020, after the lunar new year holiday. Therefore, daily data spanning from 31 January 2020 to 30 July 2021 are collected for analysis. Where, daily VN-Index data is the closing VN Index closed at the end of each trading day. SRt proxies for the Vietnamese stock market returns, calculated as SRt = Pt/Pt-1 where Pt is the closing VN index at time t, Pt-1 is the closing VN index at time t-1, extracted from the database of the Ho Chi Minh Stock Exchange (HOSE). The article employs two proxies for the Covid-19 event: confirmed cases and death cases growth rate. The data are obtained from the Oxford Covid-19 Government Response Tracker database (OxCGRT) (Hale et al., 2021). The analysis also uses the daily US dollar-Vietnamdong exchange rate, and crude oil price measured as spot West Texas Intermediate (WTI), obtained from Datastream.

Table 1

Variable description

Variables		Measurement	Source
Dependent variable	SR	Stock returns, $SR_t = P_t / P_{t-1}$, where P_t is closing VN index at time t, P_{t-1} is closing VN index at time t-1	Hochiminh Stock Exchange (HOSE)
Independent variables	DEG	Death growth rate	Oxford COVID-19 Government Response Tracker (OxCGRT) (Hale et al., 2021)
	CAG	Confirmed cases growth rate	
	OPG	Crude oil price growth rate	Datastream
	EXG	USD/VND growth rate	

Source: Author's estimation

The degree of volatility which is also termed "conditional variance of a financial asset" must be estimated in a model that best shows its time varying conditional variance (Engle & Patton, 2007). Financial time series depends on three basic factors, including their own previous values (that is, autoregressive), past information (that is, conditional), and exhibit non-constant variance (that is, heteroscedasticity) which forms the bedrock of the popular Autoregressive Conditional Heteroscedasticity (ARCH) model (Onyele & Nwadike, 2021). Hence, the presence of these fundamental features should be well captured in the proposed volatility model(s) to be adopted in a research study of this nature. The econometric techniques within the scope of GARCH family models provide the tool for solving this research problem. Therefore, to examine the impact of the

Covid-19 pandemic on stock returns and their volatility in Vietnam, the analysis considers two alternative methods of analyses. These are the GARCH and the Threshold GARCH (TGARCH) models. The construction of the GARCH and TGARCH models follows the conventional method where variance evolves over times. In the GARCH model, the conditional variance is a function of its previous own lags. In its simplest form, the symmetrical GARCH models (mean and variance equations) is specified as displayed in Equations (2) and (3):

Mean equation

$$(SR)_t = \beta_0 + \varphi_1(OPG)_t + \varphi_2(EXG)_t + \varphi_3(CAG)_t + \varphi_4(DEG)_t + \varepsilon_t \quad (2)$$

where $\varepsilon_t \sim N(0,\sigma_t^2)$

Variance equation:

$$\sigma_t^2 = \omega + \alpha_1\varepsilon_{t-1}^2 + \beta_1\sigma_{t-1}^2 + \delta_1(OPG)_t + \delta_2(EXG)_t + \delta_3(CAG)_t + \delta_4(DEG)_t \quad (3)$$

Equation (3) indicates that conditional variance is a function of four terms which is ω a constant term, ε_{t-1}^2 (the ARCH term) is the previous period's squared residual from the mean equation, σ_{t-1}^2 (the GARCH term) is the variance of the previous period's residual or stock returns volatility and four exogenous variables (growth rate of spot crude oil price, exchange rate, confirmed cases, and deaths) δ_1 - δ_4 are coefficients of the dependent variables.

With regards to the Threshold GARCH (TGARCH), the following Equation (4) was applied:

$$\sigma_t^2 = \omega + \alpha_1\varepsilon_{t-1}^2 + \gamma d_{t-1}\varepsilon_{t-1}^2 + \beta_1\sigma_{t-1}^2 + \delta_1(OPG)_t + \delta_2(EXG)_t + \delta_3(CAG)_t + \delta_4(DEG)_t \quad (4)$$

Where,

γ is the asymmetry or leverage parameter. In the TGARCH model, good news ($\varepsilon_{t-1} > 0$) and bad news ($\varepsilon_{t-1} < 0$) on the conditional variance. Here, the impact of good news is α_i while the impact of bad news is $(\alpha_i + \gamma_i)$. As such, supposing γ is positive and significant, negative shocks would have a greater impact on σ_t^2.

4. Result and discussion

The stock returns from 31 January 2020 to 30 July 2021 have been plotted in Figure 1. It can be seen from the histogram that there is volatility clustering, which is one of the stylized facts of financial time series.

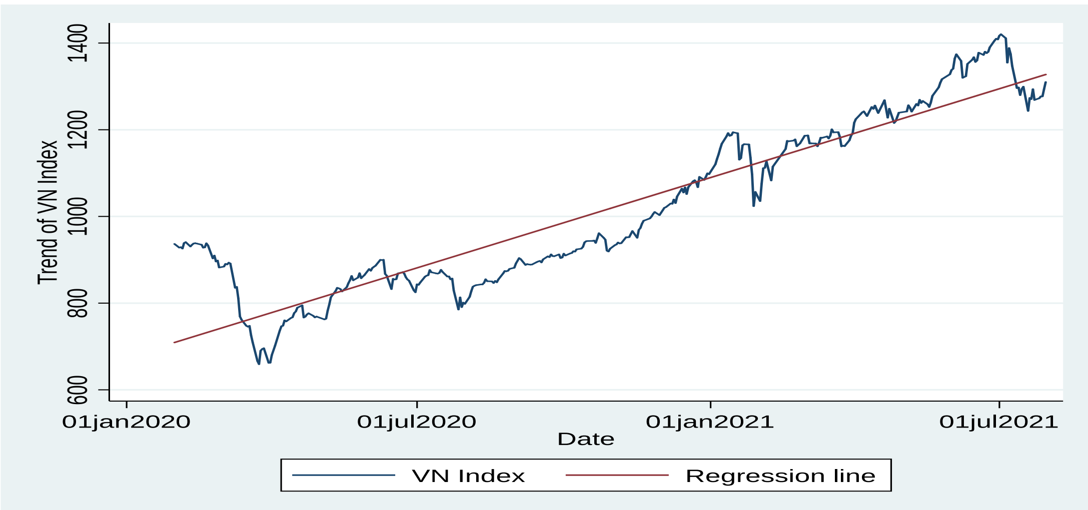

Figure 1. Trend of VN Index

4.1. Description of data

Prior to estimating the GARCH models, the inherent properties of the return series were considered. Therefore, the descriptive statistics and trends of the variables are extracted from data statistics and presented in Table 2. Since the daily data span from 31 January 2020 to 30 July 2021, when the stock market operates on working days, and then the research model has 372 observations. It can be seen from Table 2 that the average growth rate of stock return is 1.001, the maximum stock returns growth rate during the period is 1.050, and the minimum is 0.93 per day. The average growth rate of confirmed cases is 3.6% per day, the highest number of infections increases by 3 times per day while the lowest is 0, that is, there is no increase in the confirmed case. The average growth rate of death is 1.9% per day, the highest number of deaths increase by 1.3 times per day while the lowest number of deaths decreases by 3.8% per day.

Table 2

Summary description of the variables in the model

Variable	Observations	Mean	Std. Dev.	Min	Max
SRG	372	1.001	0.015	0.930	1.050
OPG	372	-0.008	0.179	-3.059	0.377
EXG	372	-0.000	0.001	-0.008	0.009
CAG	372	0.036	0.168	0.000	3.000
DEG	372	0.019	0.094	-0.038	1.333

Source: Author's estimation

A common problem in estimating regression models is multicollinearity, as it makes the estimation inaccurate. The multicollinearity exists if the correlation coefficient between pairs of variables is over 0.9 (Hoang & Chu, 2005). Table 3 shows the correlation matrix between variables. The correlation coefficients are small, the highest correlation coefficient is only 0.16. This indicates that multicollinearity is not a problem in the empirical analysis.

Table 3

Correlation matrix

Variable	SRG	OPG	EXG	CAG	DEG
OPG	0.0638	1.0000			
EXG	-0.1605	0.0025	1.0000		
CAG	-0.1519	-0.0186	0.1245	1.0000	
DEG	0.0326	0.0111	-0.0115	0.0912	1.0000

Source: Author's estimation

4.2. Unit root test and Arch effect test

Another condition for carrying out the GARCH and TGARCH analyses is for the data set to be stationary. The study proceeds with the Augmented Dickey Fuller (ADF) and Philip-Perron (PP) unit root tests to investigate whether the time series in the model are stationary or not, together with a level significance of stationarity. In addition, the presence of ARCH effect in the return series is confirmed by the ARCH-LM test (Engle, 1982). The details of the unit root and the ARCH-LM test results are presented in Table 4. It can be seen that all of the series has no unit root from the ADF and PP test approaches. The probability values of the ADF and PP t-Statistics are less than 0.01 which lead to the conclusion that the series for the sampled period is stationary, hence both the ADF and PP tests reject the hypothesis of non-stationarity of the series at all levels of significance.

Table 4

Uni root test and Arch LM test

Variable	**ADF at level**	**PP at level**
SRG	-20.459*** (0.000)	-20.119*** (0.000)
CAG	-91.696*** (0.000)	-63.718*** (0.000)
DEG	-29.135*** (0.000)	-26.806*** (0.000)
OPG	-36.985*** (0.000)	-51.944*** (0.000)
EXG	-16.618*** (0.000)	-16.624*** (0.000)
ARCH-LM Test Statistics: Prob. Chi-Square = 0.000		

Note: ***p < 0.01
Source: Author's estimation

The starting point in GARCH and TARCH models is to examine the residuals of the series of exchange rates for evidence of heteroscedasticity and determine whether it exhibits any volatility clustering. It can be seen from Figure 2 that there is volatility clustering, which is one of the stylized facts of financial time series. Using the LM-ARCH effect test as shown in Table 4, the residuals display a prolonged period of low and high volatility. In Vietnam, prolonged periods of low stock returns volatility are followed by prolonged periods of low stock returns volatility and prolonged periods of high stock returns volatility is follow by prolonged periods of high stock returns volatility. This suggests that the residual or error term exhibits clustering changes, revealing the presence of heteroskedasticity and ARCH effects. The ARCH-LM test which was used to investigate the presence of ARCH effect on the returns series is highly significant since the p-value ($p < 0.05$), leading to the rejection of the null hypothesis of "no ARCH effect" in the residuals. Based on the outcome of these preliminary tests, the appropriateness of the GARCH family models was justified.

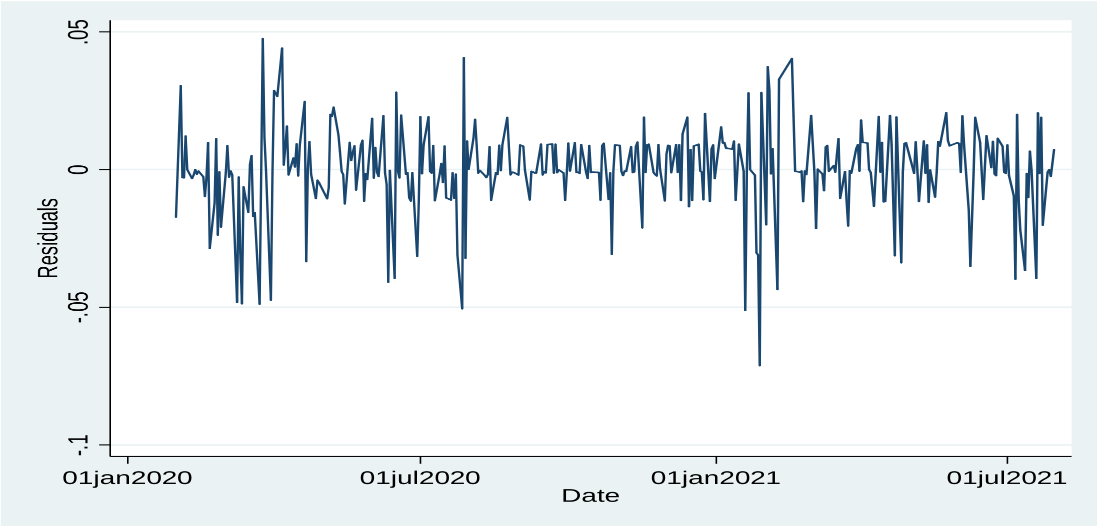

Figure 2. Time plot of the daily stock returns

Table 5

Estimation of GARCH Models

Parameters	**GARCH (1,1)**		**TGARCH (1,1)**	
	Mean Equation			
	Coefficient	P-value	Coefficient	P-value
Constant	1.002***	0.000	1.000***	0.000
OPG	0.010	0.256	0.016	0.109
EXG	-3.084***	0.000	-2.693***	0.000
CAG	-0.045***	0.000	-0.065***	0.000
DEG	0.012	0.169	0.018*	0.091
	Variance equation			
Constant	10.412***	0.000	-10.879***	0.000
Arch (-1)	0.336***	0.000	0.429***	0.000
Garch (-1)	0.420***	0.000	0.579***	0.000
Tarch (-1)			- 0.415***	0.000
OPG	-0.995	0.567	-1.203*	0.082
EXC	-449.390	0.149	-502.978	0.261
CAG	2.072***	0.001	2.286***	0.000
DEG	-6.216	0.511	-6.246	0.651
Log likelihood	1,067.945		1,072.135	
AIC	-2,111.890		-2,118.270	
BIC	-2,064.863		-2,067.324	
	Residual Diagnostics:			
Serial correlation (D-statistic)	1.477		1.406	
Normality test		0.000		0.000

Source: Author’s estimation

The data analysis provides the estimates of the parameters of the GARCH (1,1) and TGARCH (1,1) model. The coefficient estimates for the model in Equations (3) and (4) are presented in Table 5. The negative and significant coefficient of the confirmed cases growth rate, representing for Covid-19 pandemic and stock return provides a further evidence for the Covid-19 effect on financial markets outcome in Vietnam. That is, stock market returns decline as the number of confirmed cases increase. The empirical evidence supports the efficient market hypothesis, and in line with Apergis and Apergis (2020), Al-Awadhi et al. (2020) findings. Apergis and Apergis (2020) found that Covid-19 had a significant negative impact on stock returns in China, whereas Ashraf (2020) showed that stock markets respond negatively to the increase in Covid-19 for a sample of 64 countries. Particularly, the results of the variance equation indicate that the volatility of stock returns is positively related to Covid-19 infection. Similarly, the previous day's stock returns information can influence today's stock returns volatility, and the previous day's volatility of stock returns influences today's volatility in both models.

Regarding the TGARCH (1,1) estimates, the coefficients of the ARCH (α) and GARCH (β) are statistically significant at 1% level. The total of these parameters is 1.008, approximately unity (1). This figure implies that conditional variance (volatility) is explosive. Furthermore, the leverage effect coefficient is negative and statistically significant at 1% level. This finding provides further evidence of the leverage effect during the time frame, and indicates that good news or positive shocks exert a more considerable influence on the volatility of stock returns than bad news. Nonetheless, this result is unexpected as it is not in line with the theory. In addition, the drivers of exchange rates have the negative impact on mean stock returns. Finally, certain diagnostics across all models, such as the LM test statistic, denotes the absence of serial correlation in the residuals, implying that both GARCH (1,1) and TGARCH (1,1) model is well specified. However, it can be seen that the GARCH (1,1) emerged with the lowest AIC, BIC and log likelihood in absolute value. Therefore, the GARCH (1,1) was chosen as the best appropriate model.

5. Conclusions and recommendations

Stock market returns respond to major events. Previous studies have identified several epidemic diseases that have affected such returns, for example, Severe Acute Respiratory Syndrome (SARS) outbreak (Chen, Jang, Shawn, & Kim, 2007), and Ebola Virus Disease (EVD) outbreak (Ichev & Marinc, 2018). This is one of the updated studies providing a comprehensive examination of the effects of Covid-19 on both the mean and volatility of stock returns in Vietnam over the 18-month timeframe, from 31 January 2020 to 30 July 2021, by employing the GARCH technique. The analysis used the growth rate of confirmed cases and deaths as proxies for the Covid-19 pandemic. The results showed that a higher confirmed cases growth leads to a decrease in the mean of stock returns. In contrast, it leads to an increase in the volatility of stock returns. The empirical findings support the efficient market hypothesis developed by Fama (1965). They also signify the fact that the Covid-19 pandemic shock has disturbed the stock market. Indeed, the stock market experienced four remarkable drops during given period (Mar and July 2020; Feb and Aug of 2021), although the Covid-19 epidemic crisis at Vietnam was not more serious than other countries all over the world. However, the reflection of confirmed cases provided an informative opportunity for investors to get the picture of psychology and behavioral finance. Because the outbreak of Covid-19 represents a fearsome and novel risk, it stirred feverish behavior among investors, which might trigger unnecessary panic behavior in the stock market, then financial sectors might be severely impacted due to a significant decrease in the movement of capital, assets, and liquidity. This requires some certain broad interventions from the government and state bank, including both fiscal policy and monetary policy, to stay away from further adverse outcomes and harmful spreading of the Covid-19 shock among financial markets. Apergis and Apergis (2020) showed that daily stock market surge was associated with Covid-19. This result can be explained by the fact that the news on pandemic progress is constantly released and spread more quickly across market environments. In the past, the negative effect of a pandemic on stock markets outcome was moderate and lasted for several months. Nonetheless, in these days, the interpretation emphasizing on greater information and its quick spread obviously justify the enormous stock market impact since Covid-19 broke out.

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