Ekonomi, Politika & Finans Araştırmaları Dergisi, 2020, 5(Özel Sayı): 269-279
Journal of Research in Economics, Politics & Finance, 2020, 5(Special Issue): 269-279
Araştırma Makalesi, DOI: 10.30784/epfad.826736

THE IMPACT OF COVID-19 ON EMERGING STOCK MARKET VOLATILITY: EMPIRICAL EVIDENCE FROM BORSA ISTANBUL

COVID-19'un Gelişmekte Olan Pay Piyasası Oynaklığına Etkisi: Borsa İstanbul'dan Ampirik Bulgular

İbrahim YAĞLI*

Keywords:
COVID-19,
Industry Level Volatility,
Emerging Market Economy

JEL Codes:
C24, E44, G32

Abstract

The study aims to examine the impact of COVID-19 on the Turkish stock market volatility and reveal how different industries are affected by COVID-19. Volatility between pre-COVID and COVID periods are compared across industries to understand the impact of the first shock. Markov-switching dynamic regression (MSDR) model is employed to determine the transition from low volatility (pre-COVID) period to high volatility (COVID) period. The findings reveal a significant deterioration in volatility for all industries during the COVID-period, with a more dominant impact on the service sector. Then, factors that drive stock market volatility are investigated to understand the role of COVID-19 on increasing volatility. Results show that COVID-19 patients trigger volatility for all industries except food & beverages, insurance, non-metal mineral product, and wholesale & retail trade. On the other hand, an increase in the number of recoveries results in lower volatility for most of the industries. Besides, credit default swap increases volatility while the exchange rate lowers volatility. However, the magnitudes of credit default swap and exchange rate are greater than those of patients and recoveries, suggesting that COVID-19 is not the main driver of volatility for the Turkish stock market in the pandemic period.

Anahtar Kelimeler:
COVID-19,
Sektörel Oynaklık,
Yükselen Piyasa Ekonomisi

JEL Kodları:
C24, E44, G32

Özet

Çalışma, COVID-19'un Türkiye pay piyasası oynaklığı üzerindeki etkisini incelemeyi ve farklı sektörlerin COVID-19'dan nasıl etkilendiğini ortaya çıkarmayı amaçlamaktadır. İlk şokun etkisini anlamak için COVID öncesi ve COVID dönemlerindeki volatilite farklı sektörler için karşılaştırılmıştır. Düşük volatilite (COVID öncesi) dönemden yüksek volatilite (COVID) dönemine geçişi belirlemek için Markov-switching dinamik regresyon (MSDR) modeli kullanılmıştır. Bulgular, tüm sektörler için COVID döneminde oynaklıkta önemli bir bozulma olduğunu ve hizmet sektörü için bozulmanın daha fazla olduğunu ortaya koymaktadır. Daha sonra, COVID-19'un artan oynaklıktaki rolünü anlamak için pay piyasası oynaklığını yönlendiren faktörler araştırılmıştır. Sonuçlar, COVID-19 hastalarının gıda & içecek, sigorta, metal olmayan mineral ürünler ile toptan & perakende ticaret sektörleri dışındaki tüm sektörlerde oynaklığı tetiklediğini ortaya çıkarmıştır. Öte yandan, iyileşenlerin sayısındaki artış, çoğu sektör için daha düşük oynaklığa neden olmaktadır. Ayrıca, kredi temerrüt takası pay piyasası oynaklığını artırırken, döviz kuru piyasa oynaklığını azaltmaktadır. Bununla birlikte, kredi temerrüt takası ve döviz kurunun piyasa oynaklığı üzerindeki etkisi, hastalar ve iyileşenlerin etkisinden daha büyüktür. Bu sonuçlar pandemi döneminde Türkiye için COVID-19'un pay piyasası oynaklığın ana faktörü olmadığını göstermektedir.

* Dr., Nevşehir Hacı Bektaş Veli University, Department of Accounting and Finance, ibrahimyagli@nevsehir.edu.tr, ORCID: 0000-0001-8985-0172

Makale Geliş Tarihi (Received Date): 16.11.2020 Makale Kabul Tarihi (Accepted Date): 23.12.2020

1. Introduction

The coronavirus originating in Wuhan, China has spread first to Asia, and then to Europe and America and affecting all over the world in a very short time and has caused thousands of deaths. By considering the spreading speed of the virus and the number of deaths, the World Health Organization (WHO) declared the coronavirus as a pandemic on March 11, 2020. While the pandemic helps to contain the spread of the coronavirus, it adversely affects the global economy by disrupting consumption behaviors, labor markets, international trade, etc. Although the implication of the pandemic on the overall economy is not clear yet, financial markets have already responded to the COVID-19 pandemic. For instance, the Dow Jones Industrial Average index has declined by 29 percent from early February to March 3, 2020. CBOE Volatility index has risen above 80 points on March 16, 2020, reaching its highest level since the 2008 global financial crisis. The pandemic has a more devastating impact on emerging market economies since they are dealing with other economic problems such as weak external demand and capital flow contraction along with the domestic disruptions. Therefore, the International Monetary Fund (IMF) downwards the growth prospects of emerging economies by 2.8% while the downward revision for developed economies is 1.8% (International Monetary Fund [IMF], 2020).

The current study aims to investigate the impact of COVID-19 on the Turkish stock market volatility. Analyzing the nexus between COVID-19 and stock market volatility for Turkey is significant since Turkey suffers from economic problems including weak currency, higher inflation, and unemployment alongside the COVID-19 pandemic. Given the other economic problems, it is expected that the pandemic causes more damage to the Turkish economy. Consequently, Turkey's major stock market index Borsa Istanbul 100 (BIST100) has decreased by 32 percent from January 21, 2020 to March 23, 2020. Despite a relatively solid performance in the first three months of 2020, Turkey Industrial production index, another significant indicator regarding the performance of the economy, has dropped by 30 percent in April and May periods compared to the same periods of the previous year (Turkey Statistical Institute [TURKSTAT], 2020a), as the COVID-19 pandemic impairs economic activity. Similarly, the economic confidence index, which represents the expectations and trends of consumers and producers regarding the general economic condition, has declined by more than 40 points from March 2020 to April 2020 (TURKSTAT, 2020b).

The study contributes to the literature at three points. *First*, even though studies have examined the impact of the coronavirus on the stock market, these studies focus on stock market return, not stock market volatility (Al-Awadhi, Alsaifi, Al-Awadhi and Alhamadi, 2020; Ashraf, 2020; Huo and Qiu, 2020; Narayan, Phan, and Liu, 2020; Ozturk, Sisman, Uslu and Citak, 2020; Topcu and Gulal, 2020; among others). For instance, Narayan et al. (2020) examined the impact of government policies measured by lockdowns, stimulus packages, and travel bans on stock market returns for G7 countries. They found that even though all measures had a positive impact on stock market return, lockdowns are the most effective measure to mitigate the effects of COVID-19. In a similar vein, Topcu and Gulal (2020) investigated the impact of COVID-19 on stock market return for emerging markets. Findings ascertained that emerging Asian countries were the countries most affected by the pandemic while emerging countries in Europe are less affected by COVID-19. They also showed that the adverse impact of COVID-19 on emerging stock markets has decreased over time. Ashraf (2020) analyzed the impact of COVID-19 on the stock market return for a wider group of markets. Findings revealed that confirmed

cases have adversely affected the stock market return. Besides, it was determined that stock markets responded more proactively to the increase in confirmed cases than the increase in deaths. Different from others, the current study analyzes the impact of COVID-19 on stock market volatility.

Second, several studies have examined the impact of the pandemic on stock market volatility (Albulescu, 2020; Altig et al., 2020; Baek, Mohanty and Glambosky, 2020; Baker et al., 2020; Sharif, Aloui and Yarovaya, 2020; Zaremba, Kizys, Aharon and Demir, 2020; among others). However, these studies rather focus on developed economies, mostly the US. Baker et al. (2020), for instance, examined the impact of COVID-19 on the U.S. stock market volatility. The findings revealed that the novel COVID-19 pandemic has an unprecedented impact on the U.S. stock market volatility. Similarly, Albulescu (2020) investigated the nexus between financial markets volatility and the COVID-19 pandemic considering both U.S. and global COVID-19 cases. Findings elicited that the coronavirus outbreak increases volatility in the U.S. financial markets and complicates risk management. Baek et al. (2020) also analyzed the relationship between COVID-19 and stock market volatility for the U.S. However, unlike the previous two studies, they examined the aforementioned relationship at the industry level. They revealed that COVID-19 has increased stock market volatility, and the sectors most affected by the coronavirus are petroleum & natural gas and restaurants & accommodation. Altig et al. (2020) compared several uncertainty indicators including stock market volatility, policy uncertainty, and economic uncertainty for the U.S. and U.K. before and during the pandemic. They found that all uncertainty indicators increased greatly in response to the pandemic, even most of them reached their highest level. Besides, it was ascertained that there is a difference between the two countries in terms of changes in uncertainty indicators and time path. Zhang, Hu and Ji (2020) examined the impact of the pandemic on stock market risk for 13 developed markets most affected by COVID-19. The findings showed that COVID-19 increases volatility in global markets, and countries exhibit different patterns before and during the pandemic. In summary, past studies have clearly shown that COVID-19 increases the risk in global markets, however, the response of the markets to the pandemic may differ. Considering markets differently react to the COVID-19 outbreak, the study examines the impact of novel coronavirus on stock market risk for Turkey as an emerging market.

Third, although there are studies that analyze the impact of the COVID-19 pandemic on the stock market risk, very few studies address risk at the industry level (Baek et al., 2020). Besides, market level analysis acknowledges homogeneity between stock returns and volatility, however, returns and industry level volatility are more likely to be heterogeneous (Haroon and Rizvi, 2020; Rizvi and Arshad, 2018). Therefore, the current study compares industry level volatility before and during the COVID-19 pandemic and examines the impact of COVID-19 on different industries. Furthermore, previous studies employed confirmed cases or patients as a measure of the pandemic. In this study, the number of recoveries is employed along with the number of patients to understand the impact of positive news on stock market volatility.

The rest of the paper proceeds as follows. The following section presents data, methodology, and findings. Section 3 concludes the study. Ethics of research and publication were followed in this study, which does not require permission from the ethics committee and / or legal / special permission.

2. Data, Methodology, and Findings

The study aims to explore the impact of COVID-19 on the Turkish stock market volatility. Volatility is a critical indicator that gives information about the risk associated with financial markets; therefore, it attracts the attention of both institutional and individual investors. In the study, annualized historical volatility (hereafter HV) is compared at the industry level before and during the pandemic. Then, the impact of COVID-19 on stock market volatility is examined with an ordinary least square regression (OLS).

In the first stage of analysis, HV is estimated for 10 trading days using BIST100 data from January 2, 2020 to May 11, 2020 where the first phase of the normalization plan was implemented[1]. HV is calculated in three steps. In the first step, average day-to-day changes of industrial indices over the 10 days is calculated. The second step is to calculate the daily historical volatility (HV_{daily}). HV_{daily} is estimated by the second formula. In the third step, annualized HV is estimated by multiplying HV_{daily} with the square root of the number of trading days (252) in a year.

$$\bar{r} = \frac{1}{n}\sum_{t=1}^{n=10} r_t \quad (1)$$

$$HV_{daily} = \sqrt{\frac{1}{n-1}\sum_{t=1}^{n=10}(r_t - \bar{r})^2} \quad (2)$$

$$HV = HV_{daily} * \sqrt{252} \quad (3)$$

Then, the Markov-switching model (Hamilton, 1996, 2010) is employed to determine the probabilities of different states. The Markov-switching model concentrates on the mean behavior of variables. There are two groups of Markov-switching models; one is dynamic regression models and the other is autoregression models. Dynamic versions of Markov-switching models allow a rapid adjustment after the process switches state and are often used to model high-frequency data while autoregression models allow a more gradual adjustment and are generally utilized to model low-frequency data. In the study, the Markov-switching dynamic regression (MSDR) model is used since the data has a high-frequency.

Table 1. MSDR Model Results

Dependent Variable: hv(10)	coef.	std. err.	P>|z|
state 1	20.95	0.84	0.00
state 2	49.10	1.39	0.00
Sigma	6.75	0.51	
p11	0.99	0.13	
p21	0.05	0.04	

MSDR model results reported in Table 1 show that there are two different states: low volatility state and high volatility state. State 1 is the low volatility state and has a mean value of 21%. State 2 is the high volatility state and has a mean value of 49%. p11 represents the estimated probability of staying in state 1 in the next period if the process is in state 1 in the present period, and the value of 0.99 for p11 indicates that state 1 is quite persistent. On the other hand, p21 shows the probability of switching from state 2 to state 1. Therefore, the

[1] As of May 11, 2020 the number of patients has decreased to 1000s again.

probability of staying in state 2 is calculated as 1-p21. The probability of 0.95 (1-0.05) implies that state 2 is also highly persistent. Given the two different states of volatility, a structural break test is applied to detect when HV switches from a low volatility period to a high volatility period. The result reveals that BIST100 has shifted to a high-volatility period on March 9, 2020, the day two days before the first case was detected in Turkey. Therefore, the period is divided into two sub-periods: pre-COVID period (January 2, 2020 - March 8, 2020) and COVID-period (March 9, 2020 - May 11, 2020), and volatility of two periods is compared across industries.

Table 2. Comparison of the Industry Level HV for pre-COVID and COVID Periods

Industry	hv_{covid}	$hv_{precovid}$	diff.	t-test
BIST100	36.54	21.71	14.83	5.72[a]
Financials	45.21	26.79	18.42	6.17[a]
Industrials	35.44	19.97	15.47	5.65[a]
Services	51.60	30.22	21.38	6.61[a]
Banks	51.60	30.22	21.38	6.61[a]
Basic Metal	39.54	24.99	14.55	6.14[a]
Chemical, Petrol and Plastic	37.69	21.24	16.45	6.41[a]
Electricity	49.54	36.95	12.59	4.08[a]
Food & Beverage	38.98	23.84	15.14	4.47[a]
Information Technology	67.05	40.14	26.91	8.64[a]
Insurance	34.68	18.88	15.80	8.35[a]
Leasing & Factoring	71.92	54.13	17.79	3.19[a]
Metal Products Machinery	40.48	21.39	19.09	7.64[a]
Non-Metal Mineral Product	41.93	30.32	11.61	3.57[a]
Sports	96.79	66.85	29.94	3.87[a]
Technology	54.42	33.54	20.88	5.72[a]
Telecommunication	41.99	26.29	15.70	5.70[a]
Textile & Leather	50.77	30.05	20.72	5.81[a]
Tourism	65.13	48.50	16.63	4.59[a]
Transportation	65.58	38.04	27.54	8.37[a]
Wholesale & Retail Trade	41.29	16.02	25.27	6.68[a]
Wood, Paper & Printing	51.41	40.56	10.85	3.33[a]

Notes: a denotes significance at 1% level.

Table 2 presents the means of industry level HV for pre-COVID and COVID periods and the mean differences between the two periods. The findings show that volatility of all sectors increased during the pandemic period. Nevertheless, the pandemic has a more devastating impact on the service industry than the financial and industrial sectors. Among individual industries, the largest shift is detected in sports, followed by transportation and information technology. On other hand, the pandemic has less pressure on wood, paper & printing, non-metallic minerals, and electricity industries. These results may stem from the measures including social distancing, shutdown, and travel restrictions. The cancellation or postponement of public events such as sports activities within the scope of social distance measures has seriously affected the sports industry[2]. Besides, occasional shutdowns imposed by the Turkish government and travel restrictions worldwide have damaged the transportation sector. Conversely, shutdowns have caused households to spend more time at home and demand more

[2] The pandemic has resulted in the cancellation or postponement of events including 2020 Summer Olympics, Expo2020, and Eurovision Song Contest.

electricity. Product packaging, which gained importance during the pandemic, positively affected the wood, paper and printing industry.

In the following stage, OLS is performed to understand what drives risk for the Turkish stock market during the COVID-19 period[3]. Stock market risk is modeled as a function of daily patients/recoveries, credit default swap (cds), and exchange rate (exc).

$$Risk = \beta_0 + \beta_1 \text{patients} + \beta_2 \text{credit default swap} + \beta_3 \text{exchange rate} + \varepsilon \quad (4)$$

$$Risk = \beta_0 + \beta_1 \text{recoveries} + \beta_2 \text{credit default swap} + \beta_3 \text{exchange rate} + \varepsilon \quad (5)$$

Data on stock price, exchange rate and credit default swap were obtained from Investing Database (2020). The number of daily patients and daily recoveries are used to capture COVID-19 and related data were derived from the COVID-19 information page of the Turkey Ministry of Health.

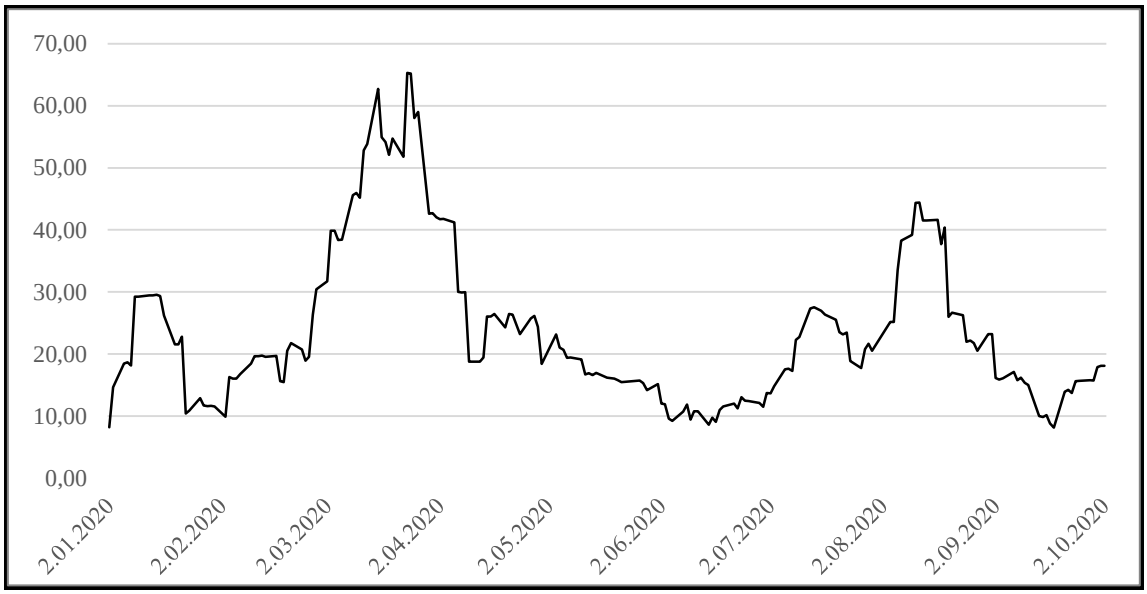

Figure 1. HV of BIST100 Index
Source: Author's Calculation

Figure 1 shows HV values of BIST100 from the beginning of the year. HV started to increase at the end of February, hitting its highest levels in March. The highest level was recorded at 65.27 on March 24, 2020. Although HV showed a decreasing trend in the following period, it started to increase again at the end of June due to the potential second virus wave.

[3] The analysis period of OLS starts from March 27, 2020 where daily COVID-19 statistics were first released by the Turkey Ministry of Health.

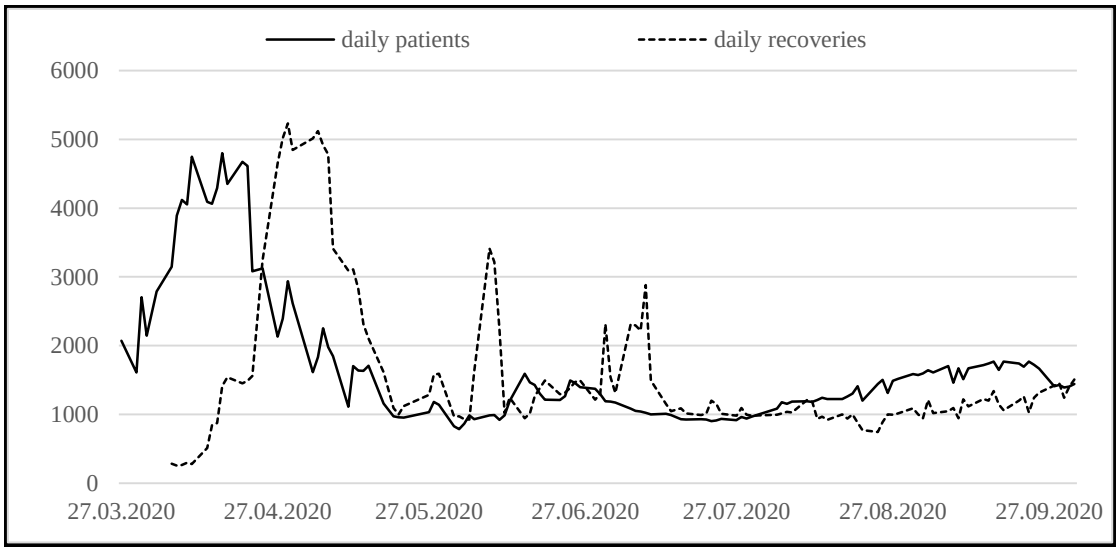

Figure 2. Daily Covid-19 Patients and Recoveries in Turkey
Source: https://Covid-19.saglik.gov.tr/EN-69532/general-coronavirus-table.html

Figure 2 depicts the number of daily patients and recoveries in Turkey from late March to early October. The number of daily patients has reached its highest level in the second week of April. The highest level was detected on April 16, 2020 with 4801 patients. After this date, the number of daily patients has decreased, and the average number of patients was around 1000s per day. The number of recoveries also followed a similar path. Although the number of recoveries suppressed the number of patients until July 2020, the number of patients increased more relative to the recoveries in the following period.

Preparatory to regression analysis, an augmented Dickey-Fuller (ADF) test is performed for unit root investigation (Dickey-Fuller, 1979). In the ADF test, the null hypothesis that the variable has unit root is tested against the alternative hypothesis that argues the variable is produced by a stationary process. According to the results in Table 3, the null hypothesis was rejected at a 5% significance level, and it was accepted that variables are stationary.

Table 3. ADF Unit Root Test Results

Variables	hv(10)	patients	recoveries	cds	exc
test-statistic	-1.93	-10.31	-3.49	-4.84	-1.79
p-value for Z(t)	0.03	0.00	0.01	0.00	0.04

Notes: The logarithmic version of the variables was used in the analysis.
Tests include a constant.

The OLS is conducted to examine the impact of the pandemic process on HV. The number of daily patients and daily recoveries are used to capture COVID-19. The credit default swap and exchange rate are employed to control other factors that affect volatility. The results reported in Table 4 show that as expected an increase in patients jeopardizes HV whereas an increase in recoveries alleviates HV. Overall, a 1% increase in the number of patients causes a 0.15% increase in HV while a 1% increase in the number of recoveries leads a decrease in HV by 0.16%. Among individual industries, the rise in the number of COVID-19 patients engenders higher volatility for most of the sectors, with a greater impact on sports, banks and transportation sectors. On the other hand, an increase in the number of patients decreases volatility for food & beverages, insurance, non-metal mineral product, and wholesale & retail trade. The increase in demand for the aforementioned sectors during the pandemic may explain

these results. On the contrary, an increase in the number of recoveries leads to a decrease in HV for all industries except basic metal, food & beverages, information technology, and wholesale & retail trade. Regarding the control variables, the increase in credit default swap causes an increase in HV while the increase in exchange rate results in a decrease in HV. Nonetheless, the credit default swap and exchange rate have a greater impact on HV than COVID-19 does; suggesting that unlike the U.S. (Baek et al., 2020), COVID-19 is not the main driver of volatility for the Turkish stock market in the pandemic period.

Table 4. Regression Results for Daily COVID-19 Patients and Recoveries

	patients	recoveries	cds	exc	constant	R-squared
BIST100	0.15[c]		0.54	-1.22	-1.54	0.14
		-0.16[a]	1.05[a]	0.13	-4.92	0.36
Financials	0.31[a]		0.30[c]	-1.76[b]	-0.01	0.17
		-0.14[b]	0.87[a]	-0.68	-3.13	0.24
Industrials	0.03		0.53[a]	-1.31	-1.06	0.10
		-0.13[b]	0.96[a]	0.22	-4.53[a]	0.32
Services	-0.15[b]		0.46[a]	-3.06[a]	1.49[c]	0.18
		-0.17[a]	0.62[a]	-1.92[a]	0.46	0.27
Banks	0.44[a]		0.07	-0.61	0.09	0.19
		-0.11[c]	0.72[a]	0.31	-3.00[b]	0.15
Basic Metal	0.09		0.53[a]	-1.35[b]	-1.06	0.18
		0.01	0.90[a]	-0.04	-4.30[a]	0.43
Chemical, Petrol and Plastic	0.11		0.31[b]	-0.79	0.28	0.07
		-0.18[a]	0.75[a]	0.33	-3.03[a]	0.27
Electricity	0.21[b]		-0.02	0.98	0.10	0.05
		-0.28[a]	0.43[a]	1.80[b]	-1.87[c]	0.24
Food & Beverage	-0.29[a]		0.74[a]	-5.33[a]	2.11[c]	0.25
		0.02	0.81[a]	-3.76[a]	-0.70	0.22
Information Technology	0.26[a]		0.72[a]	-5.58[a]	0.84	0.38
		0.07	1.21[a]	-4.48[a]	-2.57[b]	0.42
Insurance	-0.08		0.68[a]	-2.13[b]	-0.85	0.12
		-0.11[c]	0.99[a]	-0.62	-3.99[a]	0.26
Leasing & Factoring	0.02		0.78[a]	-5.76[a]	1.42	0.34
		-0.20[a]	1.20[a]	-4.40[a]	-1.66[c]	0.51
Metal Products&Machinery	0.14[c]		0.38[b]	-1.45[c]	-0.19	0.11
		-0.12[b]	0.84[a]	-0.19	-3.36[a]	0.29
Non-Metal Mineral Product	-0.32[a]		0.52[a]	-2.53[a]	1.32	0.15
		-0.13[c]	0.56[a]	-1.24	-0.60	0.11
Sports	0.57[a]		-0.34[a]	3.15[a]	-0.57	0.52
		-0.13[a]	0.31[b]	3.53[a]	-2.72[a]	0.29
Technology	0.08		0.80[a]	-4.02[a]	-0.43	0.22
		-0.12[c]	1.25[a]	-2.61[a]	-3.85[a]	0.34
Telecommunication	0.11		0.02	-2.54[a]	3.12[a]	0.11
		-0.13[a]	0.35[a]	-1.62[b]	0.97	0.13
Textile & Leather	0.09		0.55[a]	-3.23[a]	0.40	0.23
		-0.08[c]	0.93[a]	-2.11[a]	-2.42[a]	0.36
Tourism	0.05		0.45[a]	-2.99[a]	1.12	0.19
		-0.10[b]	0.74[a]	-2.10[a]	-0.96	0.28
Transportation	0.44[a]		0.32	-2.67[b]	0.33	0.19
		-0.14[c]	0.98[a]	-1.79	-2.78[c]	0.17
Wholesale & Retail Trade	-0.42[a]		0.34[b]	-4.50[a]	4.41[a]	0.34
		0.0/2	0.21	-3.22[a]	2.74[a]	0.13
Wood, Paper and Printing	0.12		0.21	-0.57	0.27	0.05
		-0.16[a]	0.57[a]	0.30	-1.89[c]	0.17

Notes: a, b and c denote significance at 1%, 5% and 10% level, respectively.

3. Conclusion

While the overall economic impacts of the COVID-19 pandemic cannot be fully predicted, there is widespread agreement among economists that the novel coronavirus has unprecedented impacts on the global economy. Nonetheless, financial markets have already reacted to the novel coronavirus; stock markets collapsed, and market volatility climbed rapidly. Even though several attempts have been made to understand the empirical impact of COVID-19 on the stock market, these are limited to developed economies. Moreover, previous research has focused on the impact of COVID-19 on the stock market return, and volatility which is critical to the operation of the stock market has been neglected.

The study explores the impact of COVID-19 on the Turkish stock market volatility. In the study, industry level volatility is compared before and during the COVID-19 pandemic to understand how various industries give reaction to the COVID-19 shock. Similar to the findings of Baker et al. (2020), Albulescu (2020), Baek et al. (2020), Altig et al. (2020) and Zhang et al. (2020), results show that volatility is climbed during the COVID-19 period. Nonetheless, a greater shift is recorded in the service sector. Regarding the impact of the COVID-19 process on stock market volatility, COVID-19 patients increase volatility while recoveries decrease volatility. The fact that an increase in the number of recoveries reduces stock market volatility indicates that investors also take positive news into account. Therefore, policies that assist to increase the number of recoveries, such as early diagnosis, may reduce stock market volatility. In addition, results reveal that industries respond differently to positive and negative news. These results may help both policymakers and investors. Policymakers should prioritize industries in their economic measures to allocate scarce resources in the most efficient way. In detail, policymakers should provide a broader stimulus package to the sectors hardest hit by the pandemic such as sports, banking, and transportation. On other hand, they should allocate fewer resources to sectors less affected by COVID-19 such as wood, paper & printing, non-metallic minerals, food & beverage, and electricity. Investors should follow-up recoveries as well as patients in their investment decision. Given industries differently respond to the COVID-19 pandemic, investors can also reduce risk by diversifying investments among several industries. Finally, it is determined that the impact of credit default swap and exchange rate on stock market volatility is greater than that of COVID-19, suggesting that COVID-19 is not the main driver of Turkish stock market volatility during the pandemic period. Therefore, investors should pay more attention to the economic issues rather than COVID-19 in their investment in the Turkish stock market.

References

Al-Awadhi, A. M., Al-Saifi, K., Al-Awadhi, A. and Alhamadi, S. (2020). Death and contagious infectious diseases: Impact of the COVID-19 virus on stock market returns. *Journal of Behavioral and Experimental Finance*, *27*. doi.org/10.1016/j.jbef.2020.100326

Albulescu, C. T. (2020). COVID-19 and the United States financial markets' volatility. *Finance Research Letters*. Advance online publication. doi.org/10.1016/j.frl.2020.101699

Altig, D., Baker, S., Barrero, J. M., Bloom, N., Bunn, P., Chen, S., ... and Mizen, P. (2020). Economic uncertainty before and during the COVID-19 pandemic. *Journal of Public Economics*, *191*. doi.org/10.1016/j.jpubeco.2020.104274

Ashraf, B. N. (2020). Stock markets' reaction to COVID-19: Cases or fatalities?. *Research in International Business and Finance*, *54*. doi.org/10.1016/j.ribaf.2020.101249

Baek, S., Mohanty, S. K. and Mina, G. (2020). COVID-19 and stock market volatility: An industry level analysis. *Finance Research Letters*, *37*. doi.org/10.1016/j.frl.2020.101748

Baker, S. R., Bloom, N., Davis, S. J., Kost, K., Sammon, M. and Viratyosin, T. (2020). The unprecedented stock market reaction to COVID-19. *The Review of Asset Pricing Studies*. *10*(4), 742-758. doi.org/10.1093/rapstu/raaa008

Hamilton, J. D. (1996). Specification testing in Markov-switching time-series models. *Journal of Econometrics*, *70*(1), 127-157. doi.org/10.1016/0304-4076(69)41686-9

Hamilton, J. D. (2010). Regime switching models. In S. N. Durlau and L E. Blume (Eds.), *Macroeconometrics and time series analysis* (pp. 202-209). Palgrave Macmillan, London. doi.org/10.1057/9780230280830_23

Haroon, O. and Rizvi, S. A. R. (2020). COVID-19: Media coverage and financial markets behavior—A sectoral inquiry. *Journal of Behavioral and Experimental Finance*, *27*. doi.org/10.1016/j.jbef.2020.100343

Huo, X. and Qiu, Z. (2020). How does China's stock market react to the announcement of the COVID-19 pandemic lockdown?. *Economic and Political Studies*, Advance online publication. doi.org/10.1080/20954816.2020.1780695

International Monetary Fund. (2020). *World economic outlook update* (June 2020). Retrieved from https://www.imf.org/en/Publications/WEO/Issues/2020/06/24/WEOUpdateJune2020

Investing Database. (2020). *Stock price, exchange rate and credit default swap*. Retrieved from https://www.investing.com/

Narayan, P. K., Phan, D. H. B. and Liu, G. (2020). COVID-19 lockdowns, stimulus packages, travel bans, and stock returns. *Finance Research Letters*. Advance online publication. doi.org/10.1016/j.frl.2020.101732

Ozturk, O., Sisman, M. Y., Uslu, H. and Çıtak, F. (2020). Effect of COVID-19 outbreak on Turkish stock market: a sectoral-level analysis. *Hitit University Journal of Social Sciences Institute*, *13*(1), 56-68. doi.org/10.17218/hititsosbil.728146

Rizvi, S. A. R. and Arshad, S. (2018). Understanding time-varying systematic risks in Islamic and conventional sectoral indices. *Economic Modelling*, *70*, 561-570. doi.org/10.1016/j.econmod.2017.10.011

Sharif, A., Aloui, C. and Yarovaya, L. (2020). COVID-19 pandemic, oil prices, stock market, geopolitical risk and policy uncertainty nexus in the US economy: Fresh evidence from the wavelet-based approach. *International Review of Financial Analysis*, *70*. doi.org/10.1016/j.irfa.2020.101496

Turkey Statistical Institute. (2020a). *Industry database.* Retrieved from data.tuik.gov.tr/Kategori/GetKategori?p=Industry-114

Turkey Statistical Institute. (2020b). *Economic confidence database.* Retrieved from data.tuik.gov.tr/Kategori/GetKategori?p=Economic-Confidence-117

Topcu, M. and Gulal, O. S. (2020). The impact of COVID-19 on emerging stock markets. *Finance Research Letters, 36*. doi.org/10.1016/j.frl.2020.101691

Zaremba, A., Kizys, R., Aharon, D. Y. and Demir, E. (2020). Infected markets: Novel coronavirus, government interventions, and stock return volatility around the globe. *Finance Research Letters, 35*. doi.org/10.1016/j.frl.2020.101597

Zhang, D., Hu, M. and Ji, Q. (2020). Financial markets under the global pandemic of COVID-19. *Finance Research Letters, 36*. doi.org/10.1016/j.frl.2020.101528