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Impact of the COVID-19 on Stock Returns: Evidence From Borsa Istanbul

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Abstract

Introduction: COVID-19 pandemic, which was first occurred in China in December 2019, has affected the world's economy. Negative effects of the virus have been seen in financial markets. So investors start to search for safe-haven properties.

Aim: This study aims to investigate the effects of COVID-19 on Borsa Istanbul Sustainability Index returns. Specifically, the impacts of COVID-19 case growth and COVID-19 based death growths on stock returns are considered.

Method: Two different models are created in order to test the hypotheses. In the first model, we mainly investigate the impact of the growth rate of COVID-19 cases on stock returns. Furthermore, we examine the impact of COVID-19 based death growth on stock returns. Fixed effect panel regressions are used in the analyses.

Findings: According to the empirical results, as the COVID-19 cases grow, the stock returns of the selected firms decrease. However, as the COVID-19 based death numbers grow, the stock returns increase. Higher rate of COVID-19 cases compared to COVID-19 based death might be shown as a reason for this result.

Key Words: Stock Returns, COVID-19, Borsa Istanbul Sustainability Index

Jel Codes: C23, E44, G12

INTRODUCTION

Countries want to increase per capita national income by growing their economic activities. However, crises experienced in financial markets at certain times affect the economies of countries negatively. The Great Depression in the USA in 1929, Black Monday in 1987, the Asian Financial Crisis in 1997 and the global financial crisis in 2008 are some of these crises. After these crises, major losses were experienced, especially in the stock markets, and the whole world economy shrank. Although these crises started in the financial markets and spread all over the world, the crises that shook the economies can sometimes be caused by pandemics.

Stock markets have so far responded to several pandemic diseases such as SARS and EVD. COVID-19 pandemic has become one of these pandemics which affect financial markets in 2020. The disease started in Wuhan City of the People's Republic of China in December 2019 and it spread around the world. On 11 January 2020, the first death from COVID-19 was observed (Pharmaceutical Technology, 2020). In Turkey, the first COVID-19 case is observed on 11 March 2020. World Health Organization (WHO) also accepted the COVID-19 as a pandemic on the same date. The US, Europe and Asia stock markets have plunged following COVID-19 pandemic. FTSE declined more than 10%, the US stock market beat the circuit breaker mechanism four times in ten days (Zhang, Hu, and Ji, 2020).

In this study, we investigate the role of COVID-19 pandemic on the stock returns of Borsa Istanbul Sustainability Index Firms. To put it differently, we examine the stock market's reaction to COVID-19. Sustainable firms are found to have higher values in the literature. Some of the studies prove that high disclosure levels and therefore lower information asymmetry makes these firm highly valued (Lo and Sheu, 2007, Ioannou and Serafeim, 2012). The sustainable firms give importance to economics,

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environmental and social factors and to corporate governance principles in their operations. That is why we suppose that these firms might be affected from COVID-19 at low levels.

LITERATURE REVIEW

COVID-19 pandemic was considered to develop in December 2019 in Wuhan City, Hubei Province of the People's Republic of China. It has affected the whole world and many world countries had to shut down their economies, shortly after. There were negative effects of it on micro/macroeconomic and financial indicators of the countries due to the gradual or complete cessation of economic activities. Consequently, national and international studies investigating the impacts of the COVID-19 outbreak on capital markets with different variables have been included in the finance literature.

Some of the studies have investigated the impacts of the COVID-19 outbreak on stock returns and volatility. Onali (2020), claiming that he conducts the first study by investigating the effect of the COVID-19 outbreak on the returns and volatility of US stock markets. He uses data from Italy, Spain, China, USA, France, Iran, and the United Kingdom. They are the countries where at least 1,000 deaths from the COVID-19 outbreak occurred as of March 31, 2020. According to his VAR analysis, he concludes that fatalities in France and Italy have a negative effect on Dow Jones returns and a positive effect on VIX. Besides, by using the Markov-Switching model, Onali discovers that the negative impact of the VIX fear index on stock returns has tripled at the end of February 2020. By investigating the connection between volatility and COVID-19 in the capital markets, Baker et al. (2020) report that the COVID-19 outbreak has been the most infectious disease in the US stock markets. They point out that mobility was caused due to the COVID-19 outbreak in the US stock exchanges, and 18 market jumps occurred on 22 trading days between February 24 and March 24, 2020. They discover that much market jump has not occurred before on the same number of trading days and that the jump frequency throughout this period has been more than 20 times the average speed since 1900. In their research, Zhang, Hu, and Ji (2020) work with the data from the stock markets of 10 countries reporting the highest number of COVID-19 cases as of March 27, 2020. As a result of their analysis, it is stated that, after the pandemic, the risks increase in the financial markets. This risk varies according to the severity of the pandemic in each country and economic losses arising from the pandemic cause high volatility in the markets. They state that nonhabitual policy interventions like zero-rate interest rate and unlimited quantitative easing, cause more uncertainty, proceeding in the long term. Sharif, Aloui, and Yarovaya (2020) address the risks of these uncertainties in terms of oil prices, with 50 observations obtained between January 21, 2020, and March 30, 2020. They also point out that the COVID-19 outbreak process and oil prices have an impact on geopolitical risk levels, on the uncertainty of economic policies, and on the volatility of exchanges. They also discover that the effect of the COVID-19 outbreak on geopolitical risk is more than the US's economic uncertainty.

After the COVID-19 outbreak was spread over the world and declared a pandemic by the World Health Organization, many stock markets entered the bear market. Accordingly, investors' preferences after this point have severely affected stock returns. In one of the studies investigating this effect, Al-Awadhi et al. (2020) investigate the impact of the COVID-19 outbreak on the Chinese capital markets with the data of the Hong Kong Stock Exchange Hang Seng Index and Shanghai Stock Exchange Composite Index companies. As a result of their panel data analysis, they report that stock returns for both indices are negatively related to the daily growth in the number of cases and with the daily growth rate of deaths due to the COVID-19 outbreak. The results of their analysis for different sectors reveal that the stock returns of information technology and pharmaceutical manufacturing companies in the COVID-19 pandemic perform better than the market. In the same period, they observe that the companies' stock returns in the beverage, air transportation, water transportation, and highway transportation sectors have

worse performance than the market. Likewise, Ashraf (2020) find that the increase in the number of daily cases and deaths in 64 different countries due to the COVID-19 outbreak between January 22, 2020, and April 17, 2020, affect the stock returns negatively. He also puts down that the stock markets' reaction to the increase in the number of cases is more cautious than the rise in deaths. Besides, he reports that markets respond severely in detecting the first cases. In another sector-based study, Kılıç (2020) examines the effect of the COVID-19 outbreak on the returns of the Borsa Istanbul sector indices. According to the results of the analysis with the daily closing data of the indices between January 2, 2020, and April 30, 2020, the highest negative returns are discovered in the tourism and textile sectors. The highest positive return is in the trade sector. Zeren and Hızarcı (2020) investigate the relation between COVID-19 outbreak cases and deaths for the period January 23, 2020- March 13, 2020, on the financial markets of China, South Korea, Italy, France, Germany, and Spain. They conclude that the deaths hit all financial markets, but the announcement of the number of cases does not affect all of them. It is stated that Italy, France, and Germany's financial markets are not affected by the case announcements. This situation is derived from the fact that investors act following behavioral finance theories in contrast to the efficient market hypothesis in the selected countries. Moreover, Şenol and Zeren (2020) examine the relation between the total number of cases and deaths from the COVID-19 outbreak for the Morgan Stanley Capital International (MSCI) World, Emerging Market, European and G7 indices. As a result of the Fourier Cointegration test, a long-term relation between exchanges and the COVID-19 outbreak is detected. In the US capital markets study, Alfora et al. (2020) report that doubling the number of COVID-19 cases in the USA decrease the return on the next day by a 4-11%, and the decrease in the number of cases increase the market return. They point out that the market value losses due to the COVID-19 outbreak increase in capital intensity and highly leveraged companies. On the other hand, according to the analysis results of the Shanghai Stock Exchange and New York Dow Jones indices between March 1, 2020, and March 25, 2020, Sansa (2020) finds that the COVID-19 outbreak has a positive and significant effect on both markets.

De Vito and Gomez (2020) investigate the effect of the COVID-19 outbreak on the liquidity of 14,245 companies from 26 countries. As a result of their stress tests, an average firm would consume cash holdings in the most unfavorable situation within two years. At this stage, they conclude that current debts would exceed the sustainable level, and approximately 53% of noncurrent debt injections would be required to prevent liquidity shortage. They also discover that within six months, nearly 10% of all companies might lose their liquidity. Besides, Ding et al. (2020) analyze the relation between the company characteristics and stock price in the COVID-19 outbreak process with the data of 6,000 companies from 56 various countries in the first quarter of 2020. According to the results, companies with a robust financial structure before 2020 are less affected by pandemic-related stock price decreases among companies that were less exposed to the COVID-19 outbreak process with their global supply chain and customer locations. They discover that firms with strong corporate social responsibility policies and a robust corporate governance structure before the pandemic presented better stock price performance against the COVID-19 outbreak. They also find that the ownership structure of the companies is effective in performance after the COVID-19 outbreak.

With the impact of the COVID-19 outbreak on the capital markets, investors' risk appetite decrease, and they start to search for safe-haven properties. Based on these relations, Ji, Zhang, and Zhao (2020) measure the effectiveness of some of the assets estimated as potential safe-haven assets against the equity index in market conditions throughout the COVID-19 outbreak process. As a result, they find that gold and soybean commodity futures are safe-haven assets during the pandemic. However, they find that Bitcoin, forex currencies, and crude oil commodity futures are not safe-haven assets. Similarly, Conlon and McGee (2020) conduct VaR (Value at Risk) analysis with Bitcoin and S&P500 index data.

After the bear market, which started in the S&P500 index with the COVID-19 outbreak, they discover that Bitcoin was not a safe-haven asset, that it causes downside risk to increase.

Since the COVID-19 outbreak has prominently various spread dates in countries, the level and times of pandemics affecting capital markets differ. In the days when the viral pandemic was first felt, though there was a sharp decline in the countries' stock market indices, there was a recovery in the capital markets with the economic and fiscal policies that were introduced later. For example, the Nasdaq Composite Index in the USA and the Shanghai Composite Index in China had new peaks by recovering the lost ground after the pandemic as of June 2020. Consequently, while there is evidence in the literature that the COVID-19 outbreak process commonly decreases stock market performances, it is possible to encounter contradictory findings. Besides, it is recognized that the effect of the COVID-19 outbreak on firm-level variables, primarily in sectors such as tourism, transportation, and textile, is more severe.

RESEARCH METHODOLOGY

This study investigates the impact of COVID-19 case growth and death growth rates on the firms listed in Borsa Istanbul Sustainability Index. The period between 11.03.2020 and 06.07.2020 is considered. The daily closing price of each stock, market-to-book values, price-to-cash flow rate and volume variables are collected from FINNET database. The number of COVID-19 cases and the number of deaths based COVID-19 are obtained from the Ministry of Health. 51 number of the firms that are listed in the Sustainability Index are considered.

Research Model

The following models are used in this study:

$$Return_{f,t} = Case_t + Volume_{f,t} + MB_{f,t} + PC_{f,t} \quad (1)$$

$$Return_{f,t} = Death_t + Volume_{f,t} + MB_{f,t} + PC_{f,t} \quad (2)$$

The definitions of the variables in the model are as follows: Return is the natural logarithm of the closing price of equity over the previous day's closing price of the equity. The case is the growth rate of COVID-19 cases in each day and Death is the growth rate of COVID-19 based death each day. Volume is the trading volume growth of each security. MB is the market-to-book value of each firm which is calculated by dividing the market value of equity to book value of equity. PC is the price-to-cash flow ratio of each firm in each day.

Firm fixed effect panel regressions are used in the analyses. These regressions provide to control for firm level omitted variables which are time invariant (Abdioglu, et al., 2015). Fixed effects models control for the effects of time-invariant variables with time-invariant effects (Williams, 2018:2). In order to make a preference between fixed effect and random effect models, we run Hausman tests. Hausman tests give chi 2(4)= 12.03 and chi2 (4)= 34.90 values for model 1 and model 2, respectively. Since these results have a 1% significance level we end up using fixed effect panel regressions.

Data Analysis

Descriptive Statistics

The summary statistics of the variables are shown in Table 1. According to Table 1, the average COVID-19 case growth of 79 days is 11% and the average death growth during this period is 5%. These ratios seem to stay at lower levels compared to death and case growth rates around the world. The market-to-book value of the average firm is 1.41 and this ratio shows that our sample firms are overvalued. Furthermore, the average price-to-cash flow ratio is 7.32 which means that the average firm's market value covers its cash flow. The trading volume growth of the sample firms is 17% on average.

Table 1- Summary statistics

Variable	N	Mean	SD	p25	p50	p75
Return	4029	0.003	0.030	-0.010	0.003	0.018
Case	4029	0.115	0.627	-0.072	-0.002	0.142
Death	4029	0.053	0.320	-0.095	0.000	0.095
Volume	4029	0.174	0.719	-0.299	-0.010	0.421
MB	4029	1.418	0.991	0.670	1.050	1.750
PC	4029	7.315	8.205	3.690	5.190	8.080

Note: N is the number of observations, Mean is mean value, SD is the standard deviation, p25 is 25th percentile value, p50 is the median value, p75 is 75th percentile value.

Table 2 shows the Pearson correlation coefficients of the variables used in this study. It seems that there is not a multi-collinearity issue in the analyses. At a univariate level, there is a negative relation between firm return and COVID-19 case growth. In addition, firm volume growth, market-to-book value and price-to-cash flow ratios positively affect the firm return.

Table 2- Pearson Correlation Matrix

	Return	Case	Death	Volume	MB	PC
Return	1					
Case	-0.2264*	1				
Death	0.0116	0.2293*	1			
Volume	0.4053*	-0.0674*	-0.0025	1		
MB	0.0496*	-0.0411*	-0.0513*	0.0250	1	
PC	0.0482*	-0.0454*	-0.0530*	0.0081	0.1424*	1

To test the stationarity of the series, we use ADF-Fisher Unit Root Test and Fisher Type Phillips-Perron tests. Table 3 shows that return, case, death, volume and MB variables are stationary if the series are constant. However, PC variable is not stationary. Thus, the first difference of this variable is calculated and checked whether it has a unit root. According to unreported unit root results, the first difference of this variable is stationary. As a result, the first difference of PC variable is used in the analyses.

Table 3- Unit Root Tests

Panel A	Constant	
	Perron	D-Fuller
Return	204.2122 ***	204.2122***
Case	250.2617***	250.2617***
Death	97.3495 ***	97.3495 ***
Volume	227.1143 ***	227.1143***
MB	5.09***	5.09***
PC	-1.9585	-1.9585

Fixed Effect Panel Regression Results

We test two different models by using fixed effect panel regressions and the results of these regressions are shown in Table 4. In the first column of Table 4, we report the results of the first model. According to the regression results, as the number of COVID-19 cases grow, the return of the sustainable firms decreases. Therefore, we show that our sample firms are negatively affected by the daily growth of COVID-19 cases. Al-Awadhi et al. (2020) similarly find a negative relation between the daily growth of confirmed cases and stock returns of the Hang Seng Index and Shanghai Stock Exchange Composite Index. Ashraf (2020) and Alfora et al. (2020) also find a negative relation between the number of daily cases and stock market returns for 64 different countries and the USA, respectively. In addition, we find that increased trading volume growth increases the return of sustainable firms. Moreover, as market-to-book value and price-to-cash flow values increase the return of the sustainable firms increase.

In column 2 of Table 4, we report the fixed effect regression analyses of model 2. The main independent variable in this model is COVID-19 based death growth and it has a positive coefficient in Table 4. Although it is expected a negative relation between increases death rate and return, a positive relation is found between these variables. One of the reasons for this positive relation can be explained by the lower

growth rate of death compared to case growth. Another reason can be the increased level of investment in Turkey during the first months of COVID-19. Investors' concern to the stock exchange is increased during this period and they might increase their investment especially in sustainable firms.

Table 4- The Impact of Case and Death Growth Rates on Returns

	Return	Return
Case	-0.009*** [0.000]	
Death		0.004*** [0.004]
Volume	0.016*** [0.000]	0.017*** [0.000]
MB	0.008*** [0.001]	0.015*** [0.000]
PC	0.001** [0.028]	0.001*** [0.003]
Constant	-0.010*** [0.003]	-0.021*** [0.000]
R-squared	0.199	0.167
N	3978	3978

Note: * p<0.1, ** p<0.05, *** p<0.01

CONCLUSION

The study investigates the impact of COVID-19 pandemic on Borsa Istanbul Sustainability Index firm returns. COVID-19 was accepted as a pandemic by WHO on 11 March 2020 and on the same date, the first COVID-19 case was observed in Turkey. Since it is observed from the previous diseases that they affected financial markets, we expect to find an impact of COVID-19 in financial markets.

We investigate the impact of COVID-19 based death and COVID-19 cases on Borsa Istanbul Sustainability Index firms. With using fixed effect panel regressions, we find that as the COVID-19 cases grow, the stock returns decrease. This result can be shown as evidence for the negative impact of COVID-19 on financial markets. Moreover, when we examine the impact of COVID-19 based death

growth on stock returns we find that as the death growth increases the stock return increases as well. This surprising result might be explained by the higher case growth compared to dead growth.

Future research might examine the impact of COVID-19 case and death growths in different industries. The impact of pandemic might vary across the industries. For instance technology industry might be the one which has been affected by pandemic at the lowest level. On the other hand, tourism industry might be the one which have been affected at most. Each industry might be examined and the impact of COVID-19 should be determined for each of them.

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