

THE REALATIONSHIP BETWEEN THE COVID-19 PANDEMIC AND THE STOCK MARKET INDEXES OF SPORTS CLUBS: A TIME SERIES ANALYSIS

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Abstract

The present study examines how severely the stock market indexes of the sports clubs in Turkey and Europe were affected and by which factors between 16.03.2020 and 14.12.2020 in addition to the coronavirus cases and deaths in the pandemic process using empirical methods. Additionally, the number of cases and death rates during the pandemic are analyzed graphically by country. In the empirical application section, the Toda-Yamamoto (1995) test was applied. Before moving on to the causality analysis, the extended Dickey-Fuller test was used to determine whether the series possessed a unit root. In the present study, which covers the period between 16.03.2020 and 14.12.2020, the case and death data of countries were used to reveal the relationship between the stock market indexes of the sports clubs in Turkey and Europe and the number of COVID-19 cases and deaths. As a result of the study, no significant value was determined between the stock market index series of sports clubs and the number of COVID-19 cases and deaths. No short-term relationship was found between the stock market indexes of sports clubs and the number of cases and deaths.

Keywords: COVID-19, Sports Clubs, Time Series Analysis.

Introduction

COVID-19 was first identified and reported in the Wuhan province of China in December 2019 (Du Toit, 2020). The disease caused by the virus was initially named the 2019 Novel Coronavirus and later renamed as COVID-19 (WHO, 2020c). COVID-19 enters the body through the same cell receptors as in Severe Acute Respiratory Syndrome (SARS) and is remotely related to Middle East Respiratory Syndrome (MERS). The typical symptoms of the disease include fever, malaise and coughing (Lu et al., 2020). At a time when the total number of cases reported worldwide reached 12 million as of July 8, 2020 and the number of deaths reached 547 thousand (Worldometer, 2020), it is observed that the impact of the COVID-19 pandemic is not limited to the loss of human life, but it also tears down social life and economic order beyond imagination and endangers the economic stability and existence of countries (Bobdey & Ray, 2020: 9). Due to its fast spread, COVID-19 is regarded as being responsible for millions of cases and deaths around the world (Lu et al., 2020). The sports economy, which occupies an important place in the economies of countries, has historically been affected by social and economic developments on a global and local scale. The current coronavirus pandemic has also impacted the sports community (Gilat & Cole, 2020; Can, 2020). Due to the increasing number of cases, many fields such as commerce, industry, arts and sports have been negatively impacted in Europe and the rest of the world and most activities came to a halt. European countries affected by this process, which constitute the top five leagues in football, are countries in which sports organizations are carried out intensively. Additionally, sports-related activities account for 3% of the global trade volume (Zeren & Gümüş, 2013, p. 35). Football in particular is the sports branch with the highest rate of following and viewing among sports organizations. Therefore, football clubs have been the ones that are the most affected by the financial crisis. In addition to games with no spectators and delayed leagues and tournaments, over 500 games were delayed in Europe. Copa America, 2020 AFC Asian Cup, 2021 UEFA Women's Championship, 2021 Club World Cup and 2021 UEFA European Nations League tournaments can be listed among the football tournaments that were delayed or rescheduled during this process. In this context, many sports clubs decided to implement financial cuts on their staff and athletes (Altunkılıç, 2020). The postponement of Euro 2020 caused UEFA an estimated loss of 300 million euros while canceling the organization cost approximately 400 million euros to the federation, adding up

to a total loss of 700 million euros (Dichter, 2020; Gough, 2020; Statista, 2020; Stuff, 2020). Among the top five European leagues, Bundesliga was the first to take the decision to play matches without spectators (35 days later) while the last football league to make a decision was Ligue 1 (48 days later). Italy was one of the countries that were affected the most by COVID-19. On the date that Serie A matches were postponed, the number of cases was recorded as 7985 while the number of deaths was recorded as 463 (Aktif Bank Ekolig Report, 2020: 8). With the postponement of sports leagues, teams were deprived of matchday revenues, a very significant source of income. For example, the matchday revenues of Barcelona and Real Madrid account for 19% of their overall income. Similarly, Arsenal suffered a 25% loss of revenue while this rate was 17% for M. United, 16% for Liverpool and 10% for M. City. The shares of Juventus on the stock market suffered a very severe loss of value (580 million euros) While the estimated loss of M. United reached millions of euros, the club also faced the risk of paying 25 million euros in compensation in accordance with the contract signed with its kit sponsor. In England, the total loss exceeded 1 billion euros as the sum of broadcast and matchday revenues as well as revenues from matches. Considering the corporate losses suffered by the clubs, it became inevitable for the total loss to reach record numbers (FIFA, 2020; TRT, 2020; Deloitte, 2020). Among the football leagues of other countries, the fastest decision-making process regarding the organizations following the first case took place in Turkey. In Turkey, immediately after the first case was observed, the matches between 13 and 16 March coinciding with Week 26 of the league were played without spectators, and it was announced one week later that the leagues had been postponed. As the number of cases declined, the Turkish Football Federation (TFF) decided that the 2019/2020 season would resume without spectators (TFF, 2020). The International Olympic Committee announced on March 24, 2020 that the 2020 Tokyo Summer Olympics and Paralympics would be postponed to the summer of 2021 (International Olympic Committee, 2020). Beyond the negative impact on athletes, the financial reflection of the postponement of the Olympics will be felt all around the world. It is stated that this postponement will result in a big loss of income and that this loss will exceed 3 billion dollars. Professional basketball league NBA reported a loss of income of 650 million dollars. Additionally, after postponing the 2019/2020 season on March 11, NBA management developed a very different concept for the remaining matches and the Playoffs considering the high number of COVID-19 cases in the United States. The remaining matches took place in a facility in Orlando owned by Disney

called the Orlando Bubble (also called the NBA Bubble) (NBA Bubble, 2020; Dichter, 2020; Gough, 2020; Staisca, 2020; Stuff, 2020). A report published by UEFA revealed that the football clubs in Europe suffered a total loss of 8.7 billion euros due to the coronavirus outbreak. In addition to this, UEFA reported that 15 first-division and 37 second-division teams from 24 countries either withdrew from their league, were expelled by the related federation or entered a bankruptcy process due to these issues since the beginning of 2020 (DW, 2021). The COVID-19 pandemic halted not only the football world, but also other sports organizations anywhere else in the world. Within the global sports industry that possesses a monetary volume of 450 billion dollars, COVID-19, which spread to all parts of the world, caused local and international sports organizations in different branches such as Formula 1, Moto GP, 149th Golf Open Championship, European Basketball Championship, Tour de France, Azerbaijan Grand Prix, Wimbledon, and 2020 Summer Olympics to either change their schedule, get postponed or get canceled. In addition to its effects on the global sports industry, the COVID-19 pandemic also severely impacted sports clubs and, therefore, sports companies. With the impact of COVID-19, it is observed that global stock markets have lost more than 30% of their value since the beginning of March. Following the day when the first case in Turkey was recorded, the Istanbul Stock Exchange (BIST) 100 index lost 7.26% of its value while this rate was approximately 35% throughout (Ünlü et al., 2020). According to Fernandes (2020), all sectors will be impacted by the COVID-19 pandemic although its outcomes will not be equal across countries and economies. In the study conducted by Floros (2014), the relationship between the success of the clubs Porto, Benfica, Ajax and Juventus and share prices using the GARCH method. As a result of the study, Floros reported that draws had a positive impact on returns for Ajax and Benfica while draws and losses had a negative impact for Juventus and there was no relationship between the variables for Porto. In another study, Berument et al. (2006) tested the effects of the results of the Champions League matches played by the clubs Beşiktaş, Fenerbahçe and Galatasaray on share prices using the GARCH-M model. The researchers found that wins had a positive effect on share prices for Beşiktaş while no such relationship was present for the other two teams. Klein et al. (2009) investigated whether there was a relationship between the results of the matches played between 1990 and 2006 by clubs traded on European stock exchanges and stock returns using the Markov-switching approach but found no significant result. Zeren et al. (2013) tested whether there was a relationship between the results of the league matches

played between 2007 and 2011 by a total of 8 domestic and foreign football clubs whose stocks are traded on the stock exchange and their stock market performance using the t-test. As a result of the test performed by Zeren et al., it was reported that there was a significant relationship between wins and stock market performance for only 1 out of 8 teams while a significant relationship was found between losses and stock market performance for 4 teams. In the related literature, no study was found on how COVID-19 cases and deaths impact the stock market indexes of sports clubs. Therefore, it is thought that the present study will contribute to the field. The present study aims to investigate the relationship between the stock market indexes of sports clubs in Europe and Turkey and the number of COVID-19 cases and deaths.

Data set and Methodology

In the present study, how severely the stock market indexes of the sports clubs in Turkey and Europe were affected and by which factors between 16.03.2020 and 14.12.2020 was examined using a daily data set. In the empirical application section, the Toda-Yamamoto (1995) test was performed. Before moving on to the causality analysis, the extended Dickey-Fuller test was used to determine whether the series possessed a unit root. In the present study, which covers the period between 16.03.2020 and 14.12.2020, the case and death data of countries were used to reveal the relationship between the stock market indexes of the sports clubs in Turkey and Europe and the number of COVID-19 cases and deaths. The Toda-Yamamoto causality analysis was used as the methodology of the study. Toda & Yamamoto (1995) showed that this test has an asymptotic Chi-Square (χ^2) distribution with k degrees of freedom regardless of whether the related series is stationary, trend-stationary, or cointegrated. Another significant feature of this method proposed by Toda & Yamamoto is that potentially biased pre-tests used in the determination of unit root and cointegration features are not required. Therefore, the risk regarding the erroneous detection of the series' degree of integration is minimized through the use of the said method. This situation allows series to include more information and successful results to be produced (Çil Yavuz, 2006: 169). On the other hand, due to being applied to the level values of series, the loss of information due to differencing is prevented, as well. In order for the Toda-Yamamoto (1995) test to be performed, first, it is necessary to determine the lag length (k) using the VAR model. In the second phase, the maximum degree of integration (d_{max}) is added to the lag length (k). In this case, the related VAR model can be formulated as follows:

$$Y_t = \delta_1 + \sum_{i=1}^{k+dmax} \alpha_{1i} Y_{t-i} + \sum_{j=1}^{k+dmax} \beta_{1j} X_t + \varepsilon_{1t} \quad (1)$$

$$X_t = \delta_2 + \sum_{i=1}^{k+dmax} \alpha_{2i} X_{t-i} + \sum_{j=1}^{k+dmax} \beta_{2j} Y_{t-j} + \varepsilon_{2t} \quad (2)$$

H0: There is no causality from Y to X.

H1: There is causality from Y to X.

In Equations 1 and 2, k represents the appropriate lag length while dmax represents the largest of the varying degrees of integration in the system. It is also assumed that error terms ε_{1t} and ε_{2t} have a mean value of zero and a constant covariance matrix. The Toda-Yamamoto method, which is an Expanded Granger analysis, has two steps: In the first phase, the VAR model that produces results sensitive to lag length is developed. The optimal lag length (k) is determined with AIC and SIC information criteria and the maximum degree of integration (dmax) of the variables in the model is determined using unit root tests. In the Toda-Yamamoto causality test, which is the second step, after the optimal lag length (k) of the VAR model and the series' maximum degree of stationarity (dmax) are determined, a VAR model with a size of (k+dmax) is predicted using the seemingly unrelated regression method. In order to determine the presence of mutual causality between the variables, the hypotheses $H_0 : \alpha_{1i}=0$ and $H_0 : \alpha_{2i}=0$ are tested using the modified WALD test statistic χ^2 distribution. In the case that the MWALD test statistic calculated is higher than the table value with k degrees of freedom, the aforementioned hypotheses are rejected (Çil Yavuz, 2006, p.169).

The unit root test developed by Dickey-Fuller (1979) and expanded into Augmented Dickey-Fuller (ADF) is formulated in Equation (1):

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \dots + \delta_{p-1} \Delta y_{t-p+1} + (1).$$

According to this, t represents the temporal dimension of the series while p represents the correlation coefficient of the series in the autoregressive process prediction constructed using the lagged values of the series. α represents the constant term while, β represents the trend. ADF uses the tau statistic created through the Monte Carlo simulation rather than the t statistic and its hypotheses are as follows:

$H_0: \delta \geq 0$, series is not stationary and includes a unit root.

$H1: \delta < 0$, series is stationary and does not include a unit root.

Finding

Figure 1. Logarithmic Charts of covid-19 case rates of countries (cases)

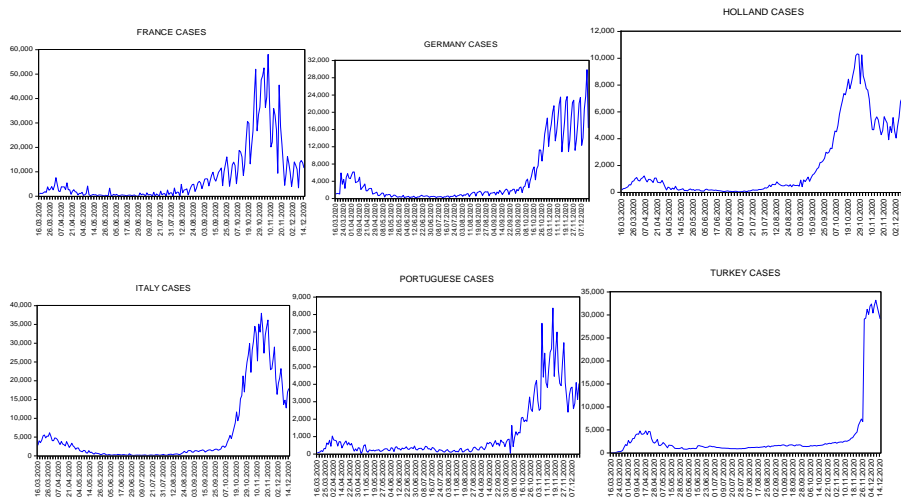


Figure 1 shows the graphs of the case numbers of the countries included in the study. It is observed from the graphs that the rate of each case does not show a distribution around a certain mean, therefore it is not stationary. Both the ADF (Augmented Dickey-Fuller) test was used to determine this. It can be said that the series do not follow the normal distribution and show typical time series characteristics.

Figure 2. Logarithmic Charts of the countries' covid-19 death rates (death)

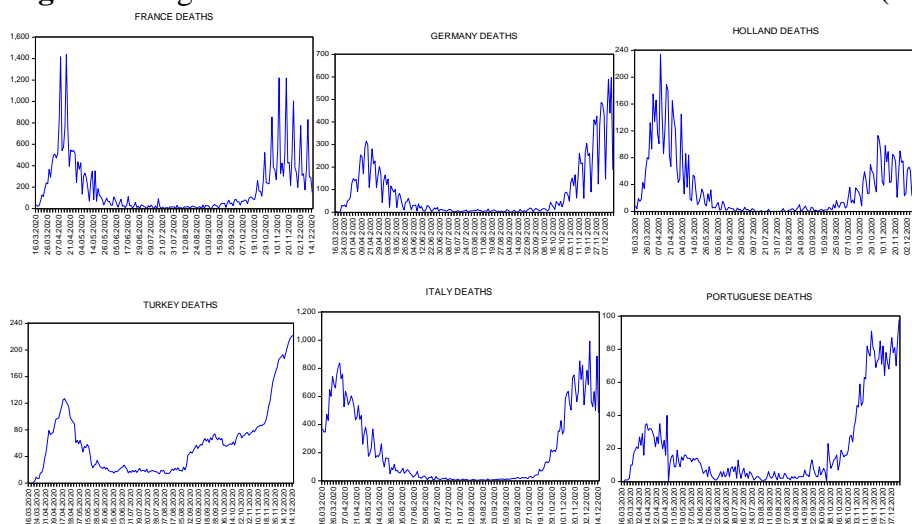


Figure 2 shows the graphs of the death numbers of the countries included in the study. It is observed from the graphs that each death rate does not show a distribution around a certain average, therefore it is not stationary. Both the ADF (Augmented Dickey-Fuller) test was

used to determine this. It can be said that the series do not follow the normal distribution and show typical time series characteristics.

Figure 3. Logarithmic Charts of the stock market index rates of sports clubs during the covid-19 pandemic period of countries

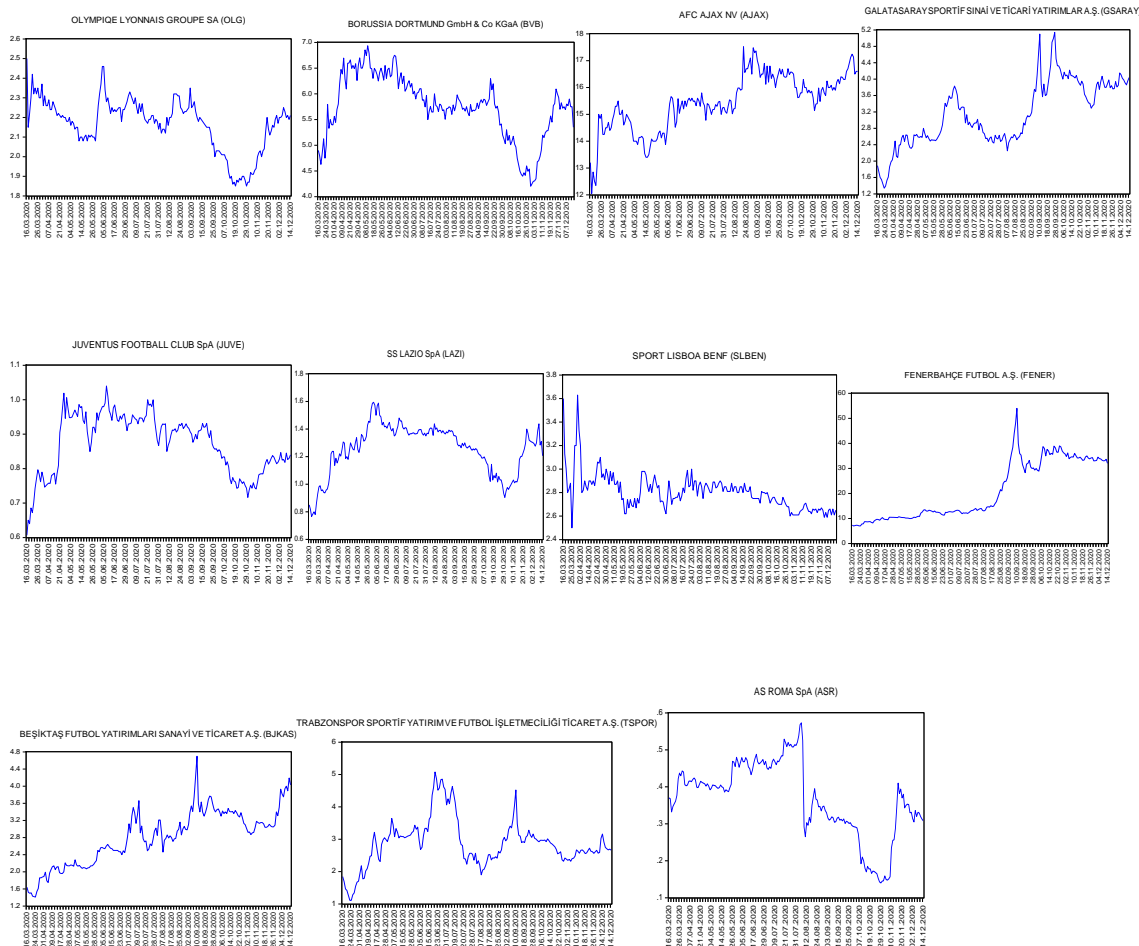


Figure 3 shows the graphs of the stock market values of sports clubs during the pandemic period of the countries included in the study. It is observed from the graphs that the ratio of each country's sports club does not show a distribution around a certain average, so it is not stationary. Both the ADF (Augmented Dickey-Fuller) test was used to determine this. It can be said that the series do not follow the normal distribution and show typical time series characteristics.

Table 1. ADF Stability Test and Todo-Yamamoto Results in France

		AUGMENTED DICKEY-FULLER (ADF) TEST					
		Level	Difference1	Difference2	Critical values		
					%1	%5	%10
France Cases	Fixed	-1.60	-5.32***	-12.73***	-3.46	-2.87	-2.57
	Fixed and trending	-2.19	-5.30***	-12.69***	-4.00	-3.43	-3.14
	Unstable and non-trending	-1.13	-5.32***	-12.76***	-2.57	-1.94	-1.61
France Deaths	Fixed	-2.49	-2.49***	-2.49***	-3.46	-4.00	-2.57
	Fixed and trending	-2.46	-2.46***	-2.46***	-2.87	-3.43	-1.94
	Unstable and non-trending	-1.89	-1.89***	-1.89***	-2.57	-3.14	-1.61
Olympique Lyonnais Groupe	Fixed	-3.09	-3.09***	-3.09***	-3.46	-4.00	-2.57
	Fixed and trending	-2.99	-2.99***	-2.99***	-2.87	-3.43	-1.94
	Unstable and non-trending	-0.64	-0.64***	-0.64***	-2.57	-3.14	-1.61

“***” is used to show the stationarity of the series at 1% significance level.

When the differences of all variables are examined according to the results of the covid-19 death, case, and the stability test of the sports club in France in Table 1, it is concluded that they are not stationary at a constant level, difference1 and difference 2 are stationary.

Todo-Yamamoto Test	Test Statistic	Value	df	Probability
France death-Olympique Lyonnais	Chi-square	4.81	8	0.77
France death-Olympique Lyonnais	Chi-square	10.67	8	0,22

When France's todo-yamato causality tests are examined, it has been determined that there is no causal relationship between the number of deaths and cases caused by the pandemic in France and the stock market indexes of the Olympique Lyonnais team.

Table 2. Germany's ADF Stability Test and Todo-Yamamoto Results

		AUGMENTED DICKEY-FULLER (ADF) TEST					
		Level	Difference1	Difference2	Critical values		
					%1	%5	%10
Germany Cases	Fixed	1.37	-3.11***	-4.14***	-3.46	-2.87	-2.57
	Fixed and trending	-0.17	-4.44***	-4.15***	-4.00	-3.43	-3.14
	Unstable and non-trending	1.89	-2.66***	4.17***	-2.57	-1.94	-1.61
Germany Deaths	Fixed	-0.43	-2.55*	-13.28***	-3.46	-2.87	-2.57
	Fixed and trending	-0.45	-2.99*	-13.27***	-4.00	-4.00	-4.00
	Unstable and non-trending	0,12	-2.40***	-13.31***	-2.57	-1.94	-1.61
Borussa Dortmund	Fixed	-1.90	-17.61***	-11.07***	-3.46	-2.87	-2.57
	Fixed and trending	-2.99	-17.65***	-11.03***	-4.00	-3.43	-3.14
	Unstable and non-trending	0.10	-17.65***	-11.09***	-2.57	-1.94	-1.61

“***” is used to show the stationarity of the series at 1% significance level

When the differences of all variables are examined according to the results of the covid-19 death, case, and the stability test of the sports club in Germany in Table 2, it is concluded that they are not stationary at a constant level, difference1 and difference 2 are stationary.

Todo-Yamamoto Test	Test Statistic	Value	df	Probability
Germany cases	Chi-square	10.51	9	0.31
Germany deaths	Chi-square	10.26	9	0.32

When Germany's todo-yamato causality tests are examined, it has been determined that there is no causal relationship between the number of deaths and cases caused by the pandemic in Germany and the stock market indexes of the Borussia Dortmund team.

Table 3. Dutch ADF Stability Test and Todo-Yamamoto Results

		AUGMENTED DICKEY-FULLER (ADF) TEST					
		Level	Difference1	Difference2	Critical values		
					%1	%5	%10
Holland Cases	Fixed	-0.34	-2.71	-6.40***	-3.46	-2.87	-2.57
	Fixed and trending	-2.20	-2.88*	-13.78***	-4.00	-3.43	-3.14
	Unstable and non-trending	-0.29	-2.58***	-6.40***	-2.57	-1.94	-1.61
Holland Deaths	Fixed	-2.39	-3.74	-12.37***	-3.46	-2.87	-2.57
	Fixed and trending	-2.58	-3.73	-12.39**	-4.00	-3.43	-3.14
	Unstable and non-trending	-1.89	-3.76**	-12.40***	-2.57	-1.94	-1.61
Ajax	Fixed	-3.10	-17.98***	-11.00***	-3.46	-2.87	-2.57
	Fixed and trending	-3.86	-17.99***	-11.00***	-4.00	-3.43	-3.14
	Unstable and non-trending	0.90	-17.94***	-11.00***	-2.57	-1.94	-1.61

“***” is used to show the stationarity of the series at 1% significance level

When the differences of all variables are examined according to the results of the covid-19 death, case, and the stability test of the sports club in the Netherlands in Table 3, it is concluded that they are not stationary at a constant level, difference1 and difference 2 are stationary.

Todo-Yamamoto Test	Test Statistic	Value	df	Probability
Holland cases-Ajax	Chi-square	8.34	9	0.49
Holland deaths-Ajax	Chi-square	12.55	9	0.18

When the Todo-Yamamoto causality tests of the Netherlands were examined, it was determined that there was no causal relationship between the number of deaths and cases due to the pandemic in the Netherlands and the stock market indexes of the Ajax team.

Table 4. Italy's ADF Stability Test and Todo-Yamamoto Results

		AUGMENTED DICKKEY-FULLER (ADF) TEST					
		Level	Difference1	Difference2	Critical values		
					%1	%5	%10
Italy Cases	Fixed	-3.24***	-3.05**	-5.14***	-3.46	-2.87	-2.57
	Fixed and trending	-4.33***	-3.07*	-5.18***	-4.00	-3.43	-3.14
	Unstable and non-trending	-2.84***	3.01***	-5.15***	-2.57	-1.94	-1.61
Italy Deaths	Fixed	-2.12	-4.08***	-10.10***	-3.46	-2.87	-2.57
	Fixed and trending	-1.95	-4.59***	-10.10***	-4.00	-3.43	-3.14
	Unstable and non-trending	-1.86	-4.13***	-10.08***	-2.57	-1.94	-1.61
Juventus	Fixed	-3.13	-14.31***	-10.59***	-3.46	-2.87	-2.57
	Fixed and trending	-3.60	-14.43***	-10.58***	-4.00	-3.43	-3.14
	Unstable and non-trending	-0.42	-14.32***	-10.62***	-2.57	-1.94	-1.61
As Roma	Fixed	-1.97	-11.18***	-11.42***	-3.46	-2.87	-2.57
	Fixed and trending	-2.68	-11.15***	-11.39***	-4.00	-3.43	-3.14
	Unstable and non-trending	-0.66	-11.21***	-11.46***	-2.57	-1.94	-1.61
Lazio	Fixed	-2.42	-13.69***	-9.81***	-3.46	-2.87	-2.57
	Fixed and trending	-2.40	-13.80***	-9.77***	-4.00	-3.43	-3.14
	Unstable and non-trending	0.26	-13.69***	-9.83***	-2.57	-1.94	-1.61

“***” is used to show the stationarity of the series at 1% significance level.

According to the results of Italy's covid death, cases, and the stability test of the sports club in Table 4, it is seen that the number of cases is stationary, including the fixed level.

Todo-Yamamoto Test	Test Statistic	Value	df	Probability
Italy cases-Juventus	Chi-square	5.96	9	0.74
Italy deaths-Juventus	Chi-square	14.09	9	0.11
Italy deaths-Lazio	Chi-square	14.07	9	0.11
Italy deaths-Lazio	Chi-square	7.38	9	0.19
Italy deaths-As Roma	Chi-square	10.53	9	0.30
Italy deaths-As Roma	Chi-square	8.30	9	0.50

When Italy's todo-yamato causality tests are examined, it has been determined that there is no causal relationship between the number of deaths and cases caused by the pandemic in Italy and the stock market indexes of Juventus, Lazio, As Roma teams.

Table 5. Portugal's ADF Stability Test and Todo-Yamamoto Results

		AUGMENTED DICKEY-FULLER (ADF) TEST					
		Level	Difference1	Difference2	Critical values		
					%1	%5	%10
Portuquese Cases	Fixed	-0.44	-3.73***	-3.92***	-3.46	-2.87	-2.57
	Fixed and trending	-1.84	-3.91***	-3.87***	-4.01	-3.43	-3.14
	Unstable and non-trending	0.12	-3.63***	-3.95***	-2.57	-1.94	-1.61
Portuquese deaths	Fixed	-1.08	-13.14***	-13.34***	-3.46	-2.87	-2.57
	Fixed and trending	0.18	-13.36***	-13.31***	-4.00	-3.43	-3.14
	Unstable and non-trending	-2.01	-22.77***	-13.38***	-2.57	-1.94	-1.61
Lisboa	Fixed	-4.47***	-10.68***	-13.40***	-3.46	-2.87	-2.57
	Fixed and trending	-6.00***	-10.64***	-13.40***	-4.00	-3.43	-3.14
	Unstable and non-trending	-0.51	-10.71***	-13.43***	-2.57	-1.94	-1.61

“***” is used to show the stationarity of the series at 1% significance level

According to the results of the stagnation test of Portugal's covid death, cases, and the sports club in Table 5, it is seen that the number of cases is stationary, including the fixed level.

Todo-Yamamoto Test	Test Statistic	Value	df	Probability
Portuquese cases-Lisboa	Chi-square	7.55	8	0.47
Portuquese deaths-Lisboa	Chi-square	12.93	8	0.11

When Portugal's Todo-Yamamoto causality tests were examined, it was determined that the increase or decrease in the number of deaths and cases caused by the pandemic in Portugal did not have a causal relationship with the fluctuations in the stock market indices of the Lisbon team.

Table 6. Turkey's ADF Stability Test and Todo-Yamamoto Results

		AUGMENTED DICKEY-FULLER (ADF) TEST					
		Level	Difference1	Difference2	Critical values		
					%1	%5	%10
Turkey Cases	Fixed	-0.31	-13.92***	-11.69***	- 3.46	-2.87	-2.57
	Fixed and trending	-0.43	-14.10***	-11.66***	- 4.00	-3.43	-3.14
	Unstable and non-trending	-0.85	-13.84***	-11.72***	- 2.57	-1.94	-1.61
Turkey Deaths	Fixed	-0.38	-6.21***	-11.92***	- 3.46	-2.87	-2.57
	Fixed and trending	-1.26	-6.37***	-11.89***	- 4.00	-3.43	-3.14
	Unstable and non-trending	-1.46	-5.98***	-11.96***	- 2.57	-1.94	-1.61
Galatasaray	Fixed	-1.83	-12.74***	-9.47***	- 3.46	-2.87	-2.57
	Fixed and trending	-2.60	-12.71***	-9.45***	- 4.00	-3.43	-3.14
	Unstable and non-trending	-0.39	-12.72***	-9.50***	- 2.57	-1.94	-1.61
Beşiktaş	Fixed	-1.79	-12.05***	-16.17***	- 3.46	-2.87	-2.57
	Fixed and trending	-3.57	-12.02***	-16.13***	- 4.00	-3.43	-3.14
	Unstable and non-trending	0.59	-11.94***	-16.22***	- 2.57	-1.94	-1.61
Fenerbahçe	Fixed	-1.09	-11.51***	-9.55***	- 3.46	-2.87	-2.57
	Fixed and trending	-2.37	-11.48***	-9.52***	- 4.00	-3.43	-3.14
	Unstable and non-trending	0.41	-11.48***	-9.58***	- 2.57	-1.94	-1.61
Trabzonspor	Fixed	-2.59	-11.54***	-9.80***	- 3.46	-2.87	-2.57
	Fixed and trending	-2.55	-11.55***	-9.77***	- 4.00	-3.43	-3.14
	Unstable and non-trending	0.26	-11.57***	-9.83***	- 2.57	-1.94	-1.61

“***” is used to show the stationarity of the series at 1% significance level

According to the results of the stagnation test of Turkey's covid death, cases, and the sports club in Table 6, the number of cases was found to be stationary, including the fixed level. When the differences of all variables were examined, it was concluded that the death at the fixed level and the sports clubs were not stationary, difference1 and difference 2 were stationary.

Todo-Yamamoto	Test Statistic	Value	df	Probability
Turkey cases-Fenerbahçe	Chi-square	0.71	3	0.86
Turkey deaths-Fenerbahçe	Chi-square	0.56	3	0.90
Turkey cases-Galatasaray	Chi-square	1.09	3	0.77
Turkey deaths- Galatasaray	Chi-square	2.61	3	0.45
Turkey cases-Beşiktaş	Chi-square	7.35	4	0.11
Turkey deaths-Beşiktaş	Chi-square	2.56	4	0.63
Turkey cases-Trabzonspor	Chi-square	0.11	3	0.99
Turkey deaths-Trabzonspor	Chi-square	7.32	3	0.06

When Turkey's Todo-Yamamoto causality tests are examined, it has been determined that the increase or decrease in the number of deaths and cases due to the pandemic in Turkey does not have a causal relationship with the fluctuations in the stock market indexes of Fenerbahçe, Galatasaray, Beşiktaş, Trabzonspor teams.

Conclusion and Suggestions

The emergence of the novel coronavirus (COVID-19) negatively impacted the world of sports, as it did all other aspects of life. Postponed organizations and matches played with no spectators cause economic difficulties in the sports sector. As the world economy was recovering prior to the emergence of COVID-19, it is being deeply damaged as this contagious disease spreads (Tosunoğlu & Kasal, 2020, p. 379). When COVID-19 was declared a pandemic by the World Health Organization, significant declines occurred in global financial markets. Stock markets collapsed as of March 2020. A number of well-known companies reported a decline of over 80% in their stock prices over a few days. When the performance of global stock markets in 2020 is examined, it is observed that top 10 stock markets exhibiting the worst performance are located in Japan, America, Portugal, Netherlands, Germany, Spain and Ukraine (Esposito, 2020). On the day after March 11, 2020, Germany's DAX index reported the highest losses within the period from 02.01.2020 to 02.04.2021 with 12.24% while this rate was 10.87% for England's FTSE-100 index, 12.28% for France's CAC 40 index, 16.92% for Italy's FTSE MIB index, and 14.06% for Spain's IBEX 35 index. In this time period, the Dow Jones and S&P-500 indexes in the United States

recorded the highest losses due to the pandemic on March 16, 2020 with 12.93% and 11.98%, respectively, while this rate was 6.08% for Japan's Nikkei-225 index on March 13, 2020, 7.72% for China's Shanghai Composite index on February 3, 2020 and 8.07% for Turkey's BIST-100 index on March 16, 2020 (Kartal,2022). In the progressing pandemic process, 9 out of 10 indexes exhibit positive progress in the period until April 2, 2021 with a strong recovery period in the stock markets (Kartal,2022). The most important reasons behind this change can be listed as the rejuvenation of the economy and the partial reduction of the panic among individuals as strict measures such as international travel restrictions and lockdowns getting eased, the increase in the sustainability of economic activities with alternative methods as a result of global digital integration and, most importantly, positive developments emerging in vaccine studies, which are regarded as the most significant weapon against the virus, reducing the impact on global stock markets. When the related literature is reviewed, it is observed that the number of studies on the subject is limited (Kartal,2022, Akarsu et al.,2020; Barut & Kaya, 2020). Therefore, how the COVID-19 pandemic affected the stock indexes of sports clubs is a significant study subject. In the present study, the relationship between the stock indexes of the sports clubs in Europe and Turkey and the number of COVID-19 cases and deaths was examined with particular focus on the sports sector, one of the most severely impacted areas during the pandemic. In the econometric application phase of the study, the stationarity of the series was investigated to test the short-term relationship. For this reason, the expanded Dickey-Fuller test was performed to test whether the series possessed a unit root. Due to the fact that the stationarity levels of the series were found to be different, in the empirical application section, the data were examined using the Toda-Yamamoto (1995) causality test by also taking into consideration that the impact of the fluctuations in the stock indexes of sports clubs during the COVID-19 pandemic may not be the same in all countries. As a result of the study, no significant value was determined between the stock market index series of sports clubs and the number of COVID-19 cases and deaths. It was found that there was no short-term relationship between the stock market indexes of sports clubs and the number of cases and deaths.

- According to studies, the sports sector experiences deep economic problems due to the COVID-19 pandemic. Therefore, in the following process, answers should be sought to the question "How will the sports sector be impacted after COVID-19?".

- When the threat of the outbreak is lifted, the state of the recovery in the sports sector will be determined by the attitude of states as well as the behavior and economic status of individuals. Therefore, it can be said that governments should provide advisory and financial support to all stakeholders of sports in order for the sports sector to recover more rapidly.

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