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THE IMPACT OF THE COVID-19 PANDEMIC ON FINANCIAL MARKETS ON SELECTED DEVELOPED COUNTRIES

SEÇİLİ GELİŞMİŞ ÜLKELERDE COVİD-19 PANDEMİSİNİN FİNANSAL PİYASALAR ÜZERİNDEKİ ETKİSİ

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ABSTRACT

Studies cannot provide adequate predictions regarding the depth and length of the Covid-19 virus because the Covid-19 pandemic is an unprecedented epidemic in terms of the lack of data gathered so far. The measures taken by governments and the deterioration of human health conditions have affected all sectors; especially production, distribution, and supply chains. The sector most severely inflicted by the epidemic is the financial markets. This study examined the effects of Covid-19 cases and CDS (Credit Default Swap) premiums on financial markets benefitting from the daily data collected between February 3, 2020, and September 20, 2021. As a result, it was seen that Covid-19 cases and CDS premiums posed a negative impact on stock market indices in selected countries (England, France and the United States). The country with the highest impact of Covid-19 cases on stock market indices is England. The country with the lowest CDS premiums on stock market indices is England and the country with the highest is the United States. More strikingly, the negative impact posed by CDS premiums on stock market returns due to the uncertainty of the epidemic was analyzed to be stronger than that posed by Covid-19 cases. Thus, governments should develop policies to reduce pandemic-induced uncertainty in the financial markets.

ÖZET

Covid-19 pandemisinin, benzeri görülmemiş bir salgın ve yetersiz veri olmasından dolayı yapılan çalışmalar virüsün derinliği ve uzunluğu hakkında yeterince öngörüde bulunamamaktadırlar. Hükümetler tarafından alınan önlemler ve sağlık koşullarının bozulması nedeniyle salgın koşulları başta üretim, dağıtım ve tedarik zincirleri olmak üzere tüm sektörleri etkilemiştir. Salgından en hızlı etkilenen kesim finansal piyasalardır. Bu çalışma, 3 Şubat 2020- 20 Eylül 2021 tarihleri arasında günlük verileri kullanarak Covid-19 vakaları ve CDS (Kredi Temerrüt Swapı) primlerinin borsa endeksleri üzerindeki etkileri incelemiştir. Sonuç olarak, seçili ülkelerde (İngiltere, Fransa ve Amerika Birleşik Devletleri) Covid-19 vakaları ve CDS primleri borsa endeksleri üzerinde negatif etki göstermektedir. Covid-19 vakalarının borsa endeksleri üzerinde etkisinin en yüksek olduğu ülke İngiltere'dir. Risk pirimlerinin borsa endeksleri üzerinde en düşük olduğu ülke İngiltere ve en yüksek olduğu ülke Amerika Birleşik Devletleri'dir. Daha da çarpıcı olan, salgının belirsizliğinden kaynaklı CDS primlerinin borsa getirileri üzerindeki negatif etkisi Covid-19 vakalarından daha güçlüdür. Dolayısıyla, hükümetler finansal piyasalarda pandemi kaynaklı belirsizliğin azaltılması yönünde politikalar geliştirmelidir.

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Introduction

Covid-19, or coronavirus disease 2019 by its full name, is an infectious respiratory illness that affects humans, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (WHO, 2020). Coronavirus emerged in Wuhan city of Hubei province of China in December 2019 and has spread rapidly all over the world. This disease has infected over 412,78 million people, causing 5,83 million deaths. The six countries affected by the pandemic most severely stand out as the USA (943,41 thousand deaths), India (509,04 thousand deaths), Brazil (638,44 thousand deaths), Russia (340,93 thousand deaths), France (134,84 thousand deaths) and England (159,57 thousand deaths) (Worldometers, 2022). As a result of the lack of medicine and vaccine during the period, the whole world population has experienced some social and economic problems with serious consequences. Various factors such as countries closing their borders to each other, international trade coming to a standstill, halting production in many sectors and substantially increasing health and public expenditures vigorously affected the global economy (Fernandes, 2020). Due to the new variants emerging, the pandemic began to rage again as of December 2021. It is observed that the number of daily cases (approximately two million cases) more than doubled the past number of daily cases (900.000 cases). However, as of the time the present study was carried out, daily death rates as a result of administered vaccines were at their lowest levels since the start of the pandemic (Worldometers, 2022).

The epidemic has gained a dimension that affects both production and demand by reason of the decrease in household income caused by travel restrictions, curfews, unpaid leave practices and working hour regulations. This contraction in the supply and demand side of the economy shows that the world is facing the most serious economic collapse it has seen since the Great Depression (Adigüzel, 2020). In the previous century, there occurred epidemics like the Spanish Flu (1918-1919), Sars Outbreak (2003), H1N1 Outbreak (2009-2010) and Ebola Outbreak (2014) that led to such mass deaths. In order to minimize the costs of the epidemic, each country has started to seek their economic measures. To this end, countries around the world have prepared emergency monetary and fiscal policy measures to protect their domestic markets. They have resorted to supporting producers and consumers via various measures such as the implementation of insurance systems, tax benefits, credit supports, cash aids and interest reductions (Jackson et al., 2020). The policies adopted by the countries to reduce negative growth rates and rising unemployment rates and the deterioration in the public finance balance were partially effective. There have been a great number of studies on the economic effects of the pandemic period (Hossain, 2020; McKee & Stuckler, 2020; Ozili & Arun, 2020; Gupta et al., 2020; Sharif et al., 2020). These studies focused on financial markets and macro variables, especially unemployment, employment, exports, imports, per capita income, gross domestic product.

The Covid-19 pandemic was officially declared a global epidemic on March 11, 2020 by the World Health Organization (WHO). Financial markets reacted seriously and quickly to this news. On March 12, 2020, the S&P 500 stock market in the USA dropped 9.51%, the Dow Jones 9.9% and the Nasdaq 9.43%. While the S&P 500 stock market was 3380.16 on February 14, 2020, it decreased to 2304.92 points on March 20, 2020, falling approximately by 33 percent. Along with the USA, there were serious depreciation in European and Asian stock markets at similar rates. In order to slow down this deep collapse of financial markets and to mitigate the effects of the pandemic, governments and Central Banks began to implement their policy tools to quantitatively expand and reduce interest rates. As an example of these policy implementations, the United States Federal Reserve (FED) announced that it would implement a zero interest rate policy and an unlimited monetary expansion policy. Similar policy practices were applied in other developed countries. However, the results of the application did not eliminate the state of uncertainty despite the recovery of the financial markets (Zhang et al., 2020). The motivation underlying our study is to determine the impact of the number of Covid-19 cases and the uncertainty caused by the pandemic on the financial markets. Our study aims to examine the degree and direction of impact of Covid-19 cases and CDS premiums on stock market indices. In order to make an effective analysis, the study focuses on developed countries the financial markets of which are deep. Taking data restrictions into account, The United Kingdom, France, and the United States were selected.

Other parts of the study are organized as follows; in the second part, the studies on the global and regional effects of the pandemic on the general economy were reviewed. In the third part, the literature concerning the effects of the pandemic on financial markets was reviewed. In the fourth chapter, the data set, the model and the empirical findings of the applied model were presented. In the final section, the outcome and policy implications were discussed.

The Effects of the Pandemic on General Economy on Global and Regional Scale

The Covid-19 pandemic has imposed very negative effects on foreign trade worldwide. Considering the effects with respect to exports, both the restrictive measures applied by the countries and the contraction with regard to supply and demand have caused a decrease in exports worldwide. According to the *"Global Economic Prospects"* report published by the World Bank in January 2021, it was predicted that global trade would increase by 4 percent in 2021, lower than previous estimates, due to the resurgence of Covid-19 cases. In addition, it was foreseen that the estimated number could be exceeded as the constraints related to the pandemic were decreasing and the number of vaccinations was increasing. In the report, it was stated that the pressure of the pandemic on consumption and investment in emerging markets and developing countries continued, and there was a strong recovery trend in China. Considering the changes of the real GDP compared to the previous year, the estimates for 2020 were as follows; developed economies -5.4% (2021f 3.3%), EMDEs (Emerging Market and Developing Economies) countries -2.6% (2021f 5%), low-income countries -0.9% (2021f 3.3%), Euro zone -7.4% (2021f 3.6%), China 2% (2021f 7.9%), United States -3.6% (2021f 3.5%), Argentina -10.6% (2021f 4.9%), Turkey 0.5% (2021f 4.5%), India -9.6% (2021f 5.4%)) and South Africa -7.8% (2021f 3.3%). In addition, World Trade Volume was expected to be -9.5% in 2020 and 5% in 2021.

Vidya and Prabheesh (2020) investigated trade commitment and direction between countries before and after Covid-19 via trade network analysis and artificial neural networks methods. As a result, they found that, following the pandemic, there was a serious decrease in the number of trade agreements and the extent of density between countries. Besides, there appeared significant changes in the structure of the trade network, and China's power to be the center in the trade network was not affected by Covid-19. Hayakawa and Mukunoki (2021) examined exports from 34 countries to 173 countries in order to determine how Covid-19 affected international trade. As a result, they found that it seriously affected importing and exporting countries, the impact of the virus on importing countries tended to be insignificant since July 2020, and the impacts were reduced slightly after the first wave of the pandemic.

Gruszczynski (2020) examined the effects of the pandemic on international trade as long and short-term effects. He stated that short-term effects would be neutralized if the virus could be controlled, but long-term effects could cause structural changes in the globalization process. Moreover, he stated that, depending on the duration and depth of the pandemic process, the domestic tendencies of the countries might increase. Song and Zhou (2020) examined the steps to be followed to ensure economic recovery after the pandemic period. As a result, they stated that structural reforms, new technology and reintegration were to constitute the basis of the recovery of countries after the pandemic. Carreño et al. (2020) stated that the pandemic process would have significant lasting effects on global trade and the measures taken by countries were constantly changing. In addition, they stated that the measures restricting global trade were constantly changing, and companies should follow the developments closely and search for new markets.

Fang et al. (2020) stated that China was the first country to encounter the pandemic period and that they took the period under control in 3 months thanks to the measures they took. This situation gained China the time to regain economic activity unlike other countries (especially the USA). They stated that China would close the year 2020 with positive growth and reach a serious growth figure in 2021. They anticipated that China would continue to be a prominent actor in terms of attracting foreign investors, despite the global trade wars it had been experiencing due to its separation from the US administration.

The spread of the Covid-19 epidemic has significantly affected labor supply and demand in different labor markets around the world. Due to the pandemic period, states closing their borders and taking measures to reduce human mobility and the prohibitions have imposed restrictions in relation to economic activities. The shrinkage of some workplaces and the temporary or permanent closure of others have caused a decrease in the demand for labor. In addition, Covid-19 has severely reduced the labor supply by threatening the health of workers and restricting their mobility. As a consequence of all this, millions of employees are globally experiencing income and job losses (Kara, 2020).

In the Covid-19 monitoring report of the International Labor Organization, it was stated that regional and sectoral measures became the norm during the pandemic, affecting 77 percent of employees (July 2020 - 85 percent). According to the report, job losses in 2020 were stated to be historically serious. Global working hours (equivalent to 250 million full-time jobs) decreased by 8.8 percent (Low-Income Countries 6.7%, Lower-Middle-Income Countries 11.3%, Upper-Middle-Income Countries 7.3% and High-Income Countries 8.3%) compared to the last quarter of 2019. There occurred 114 million (Shift to unemployment 33 million and Shift to inactivity 81 million) global employment losses in the world in 2020 in comparison to 2019. Relatively, employment loss was 5% higher for women than men and %8.7 higher for young people than elderly. It was further mentioned that there was an 8.3% decrease in global labor income (Low-Income Countries 7.9%, Lower-Middle-Income Countries 12.3%, Upper-Middle-Income Countries 7.6% and High-Income Countries 7.8%) for 2020 and this rate corresponds to 4.4% of the World GDP. The highest loss of income (10.3%) occurred for the employees in the USA (ILO, 2020).

In the study carried out by Karim et al. (2020), it was stated that the immigrant workers from Bangladesh worked in other countries, especially in Europe, the USA, Canada, Australia, the Middle East, Singapore and Malaysia, transferring a fund of around 15 billion dollars to their country every year. The study further mentioned that these funds had an important place concerning the development of the economy of Bangladesh. They stated that the epidemic period pushed migrant workers to a state of unemployment and that the funds transferred were seriously reduced. In their study, Sazmaz et al. (2021) examined the Impact of Covid-19 on the European Unemployment and Labor Market Recession. In the study, they analyzed the unemployment trends in the five major EU countries (Germany, Spain, France, Italy and Poland). They compared the trends during the pre-pandemic period and those emerging during the pandemic period. The results show that there is a strong recovery in the labor market, although the pandemic has had a negative impact on unemployment rates and labor recession.

Kawohl and Nordt (2020) made a research based on their initial one. The initial study (Nordt et al., 2015) stated by modeling the effect of unemployment on suicide via public data from 63 countries that unemployment increased suicide rates by 20-30% between 2000-2011. In the study Kawohl and Nordt carried out (2020), based on the job loss scenario of the covid period published by the International Labor Organization (ILO) on March 18, 2020, the unemployment rate would rise from 4.9% to 5.6% in the high scenario, and it would cause 9570 suicide cases in a year. They stated that in the low scenario, this situation would cause an additional 2315 suicide cases each year.

Francis (2020) stated in his study that nearly half of the people seeking a job due to the pandemic in South Africa could not find one, and that two-thirds of the job losses were against women. She mentioned that gender discrimination deteriorated the situation of women in the Covid pandemic period. Farrell et al. (2020) stated in their study that unemployment insurance played a prominent role in the USA. In their study, they stated that while the epidemic reduced the expenditures of workers by 10 percent, those who received unemployment wages increased 10 percent. They stated that this was due to the US $ 600 additional aid to all aid recipients, and that there was a 20 percent reduction in the expenses of those whose aid was delayed.

Şahin et al. (2020) analyzed unemployment rates in the USA according to stock-flow dynamics. As a result of the analysis, they anticipated that the USA would reach the highest unemployment rates in May 2020 and that these rates would decrease in June 2020 and approach 7.5% at the end of the year. Upon the comparison of the results of the study to the real unemployment rates in the USA, it is seen that the rate of 6.7% was reached by the end of the year. In addition, the unemployment rate was 6.3% in January 2021. Therefore, it is comprehended that the predictions of the study are structurally consistent.

Barbieri Góes and Gallo (2021) looked into the dynamic interaction between the epidemiological evolution of the pandemic and the macroeconomic effects of the lack of adequate vaccination. They found out that an epidemic balance was formed between the positivity rate of Covid-19 and the unemployment rate in the period when there was no widespread immunity in the system they established via two equations. In this state of equilibrium, new infections were stable at a positive level. They indicated that this equilibrium situation would lead to fluctuations in terms of unemployment rates. They projected this situation onto the US economy. There have been many studies conducted in the expanding literature on the economic impacts of the pandemic period

in the USA (Atkeson, 2020; Berger et al., 2020; Bethune & Korinek, 2020; Glover et al., 2020; Kemp-Benedict, 2020; Kuloğlu, 2021).

The economic impacts of the pandemic being examined on a sectoral basis, it is understood that not every sector has been equally affected. The effects of the crisis on unemployment are much greater in some sectors than in others. Manufacturing industry, real estate sector, accommodation and food services are the leading sectors in terms of being mostly affected. The least affected sectors stand out as those operating in the realms of public services, education, human health, and social service activities. Apart from these, individual businesses and micro-enterprises have been directly affected (Kara, 2020).

According to the basic scenario estimations put forward by the IMF in October 2020, it was foreseen that the working hours would be between 3 and 4,6 percent down in the case of the pessimistic scenario; on the other hand, 1,3 percent down in the case of the optimistic scenario in 2021 compared to the last quarter of 2019. The forecasts by international organizations involved many uncertainties due to the unclear transformations in the pandemic period and the responses to the policies implemented. Considering the measures put into place in the American and European countries, more working hour losses are expected in these countries than in other countries (ILO, 2021). In the light shed by the conducted studies and forecasts, it is clear that the constraint of the pandemic regarding unemployment and working hours is decreasing. Based on the basic, optimistic and pessimistic scenarios, it is predicted that the average world employment and working hours in 2022 will reach and exceed the figures in 2019.

The Impact of the Pandemic on Financial Markets

The pandemic period has had profound effects on the financial markets. With the serious increase in the risk premiums of the countries, it has caused the investors to experience big losses in a short time and the volatility to increase excessively. The World Health Organization (WHO) officially announced the coronavirus epidemic to be a global pandemic on March 11, 2020. Since then, many countries have implemented strict quarantine policies, causing a serious decrease in economic activities. The circuit breaker mechanism, which had only worked once in 1997 since 1987, worked 4 times in the US stock market in March 2020. Similarly, the UK main index (FTSE) exhibited the highest drop since 1987, falling more than 10% on 12 March 2020. The Japanese stock market had also declined by more than 20% by the end of March 2020 compared to December 2019. The US Federal Reserve (FED) responded to the fluctuations in the financial markets by announcing a zero percent interest rate policy and a $ 700 billion quantitative development program on March 15, 2020 (Zhang et al., 2020).

Zhang et al. (2020) stated in their research that the pandemic period created great uncertainty and that the markets took an unpredictable path. In addition, they noted that the Quantitative Expansion (QE) policies implemented in the USA by unconventional methods could increase the uncertainty and cause problems in the long run. Lilley and Rogoff (2020) remarked that Quantitative Expansion (QE) and zero-interest policies would be insufficient in order for the markets to recover in times of deep recession and crisis in a world with a low inflation rate and that a negative interest policy had to be adopted. In addition, they expected that, because the markets were insufficient in terms of the means to keep the FED inflation at the target of 2%, the CPI (Consumer Price Index) inflation in the next 10 years would be 1.3% down on average. They added that since the restriction of the FED with the zero interest limit would cause the expected inflation rate to fall, it seemed inevitable to switch to a negative interest rate.

Topcu and Gulal (2020) investigated the impacts of the pandemic on the developing stock markets between March 10 - April 30, 2020. The results indicated that the effect of the epidemic was gradually decreasing on the developing stock markets. They stated that the impact of the epidemic on a regional basis was more on Asian stock markets than on European stock markets. They noted that the size and duration of the Government's incentive packages were effective in reducing the effects of the pandemic.

Sansa (2020) examined the effects of Covid-19 on financial markets in China and the USA between March 1 and March 25, 2020 using the data gathered from the Shanghai Stock Exchange and New York Dow Jones stock market respectively. The empirical findings of the study showed that there was a positive and significant relationship between Covid-19 in China and the USA and all financial markets (Shanghai stock exchange and New York Dow Jones). This suggests that the epidemic has had a significant negative impact on the financial markets in China and the USA.

Estrada et al. (2020) investigated the behavior of capital markets in the event of the epidemic in the S&P 500, TWSE, Shanghai Stock Exchange, Nikkei 225, DAX, Hang Seng, U.K.-FTSE, KRX, SGX, and Malaysia-FTSE stock exchanges. In their analysis of 10 stock markets around the world, they stated that the effects of the pandemic could cause similar damages to the 1929 crisis. They stated that the epidemic had sudden and profound economic effects and that as long as the restrictions continued, the potential output would remain even lower than the normal recession.

Ashraf (2020) analyzed the economic impact of government support packages, quarantine measures, and awareness programs across 77 countries between January 22 - April 17, 2020, utilising daily stock returns. As a result, he mentioned that governments' social distance measures had direct negative and indirect positive effects. He stated that the direct negative effect of expected negative stock returns decreased and the indirect effect resulted in positive market revenues through government incentive packages and announcements. Therefore, he stated that further data were required regarding the sum of these effects were. Açıkgöz and Günay (2020) stated that the Covid-19 virus had a serious negative impact on employees, financial markets and supply chains, and that it would cause a global recession in their literature review study. In addition, they acknowledged that the extent and duration of the economic contraction could not be predicted since it could not be determined how the pandemic period would be completed.

Ali et al. (2020) stated in their study that the pandemic period created a deep crisis in the financial markets due to high volatility and that the global stock markets lost 30% in 100 days. They also stated that as the virus epidemic turned into a pandemic, the markets got into more lather and thus a worse situation. Finally, they stated that the Chinese stock markets were recovering as the virus passed to the US stage, thanks to the measures taken by the authorities. Wei and Han (2021) examined the impact of monetary policy on the transfer of financial markets on 37 country samples. As a result of their endeavour, they concluded that the pandemic significantly weakened the transmission of monetary policies to financial markets. They stated that unconventional monetary policies became more effective during the pandemic period and that strong monetary policy practices were to be needed in the post-pandemic period.

Zhang and Hamori (2021) examined the relationship between financial returns and volatility in terms of oil and stock markets during the pandemic period by utilising a time history approach and a methodology based on frequency dynamics. They concluded that the losses in oil and stock markets under the influence of Covid-19 exceeded the losses of the 2008 global financial crisis, and the effects of the epidemic on the markets in the short and long term were unclear.

There are many other studies examining the effects of the pandemic period on financial markets (Nicola et al., 2020; Schoenfeld, 2020; Albulescu, 2020; Topcu et al., 2021). The results generally stated that the pandemic period had a sudden and profound effect, fluctuations continued due to the uncertainty of the process, and unconventional monetary policies were more effective during the period. In addition, it was emphasized that strong monetary policies should be implemented after the pandemic because the effects of the epidemic in the long term could not be predicted.

Model, Data, and Empirical Results

The model of the study was developed following the analysis applied by Topcu and Gulal (2020). In their model, they analyzed the effects of exchange rates, Covid-19 cases, and oil prices on stock market returns. In their study on 26 emerging markets, they stated that Covid-19 cases had a negative effect on the stock market index. The present study examines the effect of Covid-19 cases on stock market indices in selected developed countries, similar to their model. The main difference that distinguishes the model from Topcu and Gulal (2020)'s model is that countries' risk premiums are also included in the model implemented in the present research. CDS was utilised as the risk premium variable of the countries. CDS is the value that protects the creditor against the risk of non-repayment of a loan and is employed to ensure he loan (Ericsson et al., 2009). This variable is an important risk indicator that is closely followed by market actors. The basic model is given below;

$$SMI_i = \alpha_0 + \alpha_1 COV_{it} + \alpha_2 EXCR_{it} + \alpha_3 CDS_{it} + \varepsilon_{it} \quad (1)$$

In equation (1), i refers to index countries; SMI refers to stock market indices; COV refers to daily confirmed Covid-19 cases; EXCR refers to exchange rates and CDS refers to the risk premiums of the countries. In the study, stock market index (FTSE100, CACALL and SP500 respectively) and exchange rate (UK Pound Sterling Index, Euro Index and US dollar index (DXY) respectively) data of England, France and the United States were used. The descriptive statistical values of the data sets are given in Table 1. Daily data between February 3, 2020, and September 20, 2021, were made use of within the framework of the study. The data related to Covid-19 were obtained from Worlddometer Statistics (2021). Stock market index, exchange rate and CDS data were acquired from the Investing Database (2021).

Table 1. Descriptive Statistics

		Mean	Median	Max	Min	Std. Dv.	Skewness	Prob.	Sum	Obs
FR	**CDS**	22.3373	20.040	51.390	15.050	7.774238	1.866677	0.000	8778.55	394
	COV	12630.5	6958.0	106091	-46121.	15284.98	1.847540	0.000	4963823.	394
	EURINX	105.753	105.99	112.12	95.940	4.271441	-0.375260	0.000	41666.67	394
	CACALL	4298.54	4316.4	5273.7	2888.8	582.6083	-0.092434	0.000	1689328.	394
UK	**GBPINX**	83.4506	75.135	138.34	67.170	21.79282	1.711083	0.000	32879.5	394
	FTSE100	6470.10	6529.0	7469.0	4907.0	529.0154	-0.281707	0.000	2549222.	393
	COV	12915.1	5474.0	68192.	-47870	14487.60	1.230498	0.000	5088571	393
	CDS	10.2026	8.4000	27.970	5.0000	5.454667	1.450217	0.000	4019.83	393
USA	**DXY**	93.6832	92.750	102.75	89.440	3.165565	0.918195	0.000	36911.2	394
	COV	78261.6	55146.	302959	1.0000	70869.57	1.160308	0.000	3083508.	394
	CDS	14.3877	14.950	25.000	-24284	4.965183	-2101035	0.000	5668.77	394
	SP500	3645.71	3654.9	4536.9	2237.4	542.9016	-0.187604	0.000	1436412.	394

In the data set analysis, the steps applied by Merlin and Chen (2021) were followed. First of all, unit root tests were carried out to determine whether the series are stationary or not. Then, the long-term cointegration relationship between the series was investigated via the Johansen cointegration test. Upon determining the cointegrating relationship, the direction and magnitude of the relationship between the variables were investigated by employing FMOLS (Fully Modified Ordinary Least Squares: Fully Modified Least Squares), DOLS (Dynamic Ordinary Least Square) and CCR (Canonical Cointegrating Regression: Canonical Cointegrating Regression) methods. The stationarities of the variables were tested with ADF (Augmented DickeyFuller), PP (Philips-Perron) and KPSS (Kwiatkowski, Phillips, Schmidt and Shin) unit root tests. The results obtained from the unit root tests are given in Table 2. Upon the examination of the significance levels in the ADF and PP tests, it was seen that the variables related with France, England and the United States had unit-roots. The first difference of the series of the variables being taken, it was acknowledged that they became stationary. Unlike other KPSS tests, ADF and PP tests, it is tested under the stationary null hypothesis. Therefore, the probability values that are significant at the levels but not significant at the primary differences confirm that the primary differences of the series are stationary.

Table 2. Unit Root Test Results

		Augmented Dickey Fuller		Philips-Perron		KPSS LM	
Countries	**Variables**	**I (0)**	**I(1)**	**I (0)**	**I(1)**	**I (0)**	**I(1)**
FR	**Lcov**	.10>	.01<	.10>	.01<	.01<	.10>
	Lexcr	.10>	.01<	.10>	.01<	.01<	.10>

	Lcds	.10>	.01<	.10>	.01<	.05<	.10>
	Lsmi	.10>	.01<	.10>	.01<	.01<	.10>
UK	**Lcov**	.10>	.01<	.05>	.01<	.01<	.10>
	Lexcr	.10>	.01<	.10>	.01<	.01<	.10>
	Lcds	.10>	.01<	.10>	.01<	.01<	.10>
	Lsmi	.10>	.01<	.10>	.01<	.01<	.10>
US	**Lcov**	.10>	.01<	.10>	.01<	.01<	.10>
	Lexcr	.10>	.01<	.10>	.01<	.01<	.10>
	Lcds	.10>	.01<	.10>	.01<	.01<	.10>
	Lsmi	.10>	.01<	.10>	.01<	.01<	.10>

Note: Significance values of unit root tests are given in Table 2. Test results refer to fixed + trend models. In the ADF test, Schwarz Information Criterion was used for the lag length and the maximum lag length was taken as 13. Barlett Kernel estimation method was used to determine the lag length in KPSS and PP tests.

After performing the stationarity tests, the long-term cointegration relationship between the variables was investigated via the Johansen (1988, 1995) cointegration test. In this test, two likelihood ratios are used as the trace statistics and the maximum eigenvalue statistics. The Johansen cointegration results in Table 3 show that there is one cointegration at 5% significance level in France and England, and two cointegration at 5% significance level in the United States. Therefore, it is acknowledged that there is cointegration between the variables belonging to France, England and the United States of America in the long run.

Table 3. Johansen Cointegration Test Results

		Trace Test ($\lambda trace$)			**Maximum Eigenvalue (λmax)**		
Countries	**H0**	**Trace Statistics**	**%5 Critical Value**	**Prob**	**Max-eigen Value**	**%5 Critical Value**	**Prob**
FR	**r=0***	49.21848	47.85613	0.0370	30.38812	27.58434	0.0213
	r≤1	18.83036	29.79707	0.5052	9.733057	21.13162	0.7693
	r≤2	9.097304	15.49471	0.3565	7.819284	14.26460	0.3974
	r≤3	1.278021	3.841465	0.2583	1.278021	3.841465	0.2583
UK	**r=0***	53.69101	47.85613	0.0128	31.70134	27.58434	0.0139
	r≤1	21.98967	29.79707	0.2991	12.64920	21.13162	0.4850
	r≤2	9.340475	15.49471	0.3348	7.673977	14.26460	0.4128
	r≤3	1.666499	3.841465	0.1967	1.666499	3.841465	0.1967
US	**r=0***	70.41659	47.85613	0.0001	38.26267	27.58434	0.0015
	r≤1*	32.15392	29.79707	0.0263	21.26997	21.13162	0.0478
	r≤2	10.88395	15.49471	0.2187	6.499721	14.26460	0.5499
	r≤3*	4.384228	3.841465	0.0363	4.384228	3.841465	0.0363

Note: The critical value is the value at the .05 significance level. The * sign indicates cointegration at the 5% significance level. According to the VAR model, Akaike (AIC), Schwarz Information Criteria (SIC) and Hannan-Quinn Information Criteria (HQ) lag length was taken as 3 and 8 for shock period and vaccination period, respectively. The critical values for the trace statistics and maximum eigenvalue statistics tests are taken from Osterwald - Lenum (1992). The letter r represents the number of cointegrating vectors.

For the purpose of determining the cointegration coefficients among the variables, the direction and size of the relationship were revealed by using FMOLS, DOLS and CCR methods. FMOLS was first used by Phillips and Hansen (1990) and it is used so as to eliminate the internality problem in regressors caused by the existence of cointegration relationship. In addition, the problems caused by the long-term correlation between the cointegration equation and the stochastic regressor changes are eliminated by the FMOLS method. The main feature of the FMOLS estimator is that it is asymptotically unbiased (Saboori et al., 2014). To check the robustness of FMOLS and DOLS methods, the CCR method was applied. The CCR estimator was proposed by Park (1992) and is an efficient estimator used to eliminate the deviations arising from the least-squares method. Estimation results are given in Table 4.

Tablo 4. FMOLS, DOLS ve CCR Test Results

Countries		**FR**		**UK**		**US**	
Lsmi	**Variable**	**Cofficient**	**Prob**	**Cofficient**	**Prob**	**Cofficient**	**Prob**
FMOLS	**Lcds**	-0.108854	0.0000	-0.103673	0.0000	-0.402888	0.0000
	Lcov	-0.038433	0.0000	-0.016963	0.0000	-0.008894	0.0046
	Lexcr	3.729851	0.0000	-0.136471	0.0000	-0.879047	0.0069
	C	-8.374357	0.0000	9.860151	0.0000	13.15363	0.0000
DOLS	**Lcds**	-0.109839	0.0000	-0.103495	0.0000	-0.394758	0.0000
	Lcov	-0.038785	0.0000	-0.016965	0.0000	-0.008728	0.0080
	Lexcr	3.740115	0.0000	-0.131906	0.0000	-0.967212	0.0039
	C	-8.416419	0.0000	9.838577	0.0000	13.53204	0.0000
CCR	**Lcds**	-0.108542	0.0000	-0.103674	0.0000	-0.403013	0.0000
	Lcov	-0.039393	0.0000	-0.016995	0.0000	-0.008955	0.0037
	Lexcr	3.768167	0.0000	-0.136587	0.0000	-0.877912	0.0068
	C	-8.545927	0.0000	9.860801	0.0000	13.14812	0.0000

Following the examination of FMOLS, DOLS and CCR test results standing in Table 4, it is understood that the risk premiums of all countries have a negative effect on the stock market indices. Similarly, it is seen that Covid-19 cases have a negative effect on stock market indices in all countries. The table makes it visible that exchange rates have a negative effect on stock market indices for England and the United States. It is observed that the effect of risk premium, Covid-19 cases and exchange rates on the stock market index in the UK is negative, and the country most negatively inflicted by Covid-19 cases in terms of its stock market indices is England. The table further shows that the country inflicted with the lowest effect of risk premiums on its stock market indices is England whereas the country with the highest is the United States. Moreover, the table makes it obvious that the country suffering from the severest effect of exchange rates on its stock market indices is France and the country suffering from the least severe effect in this respect is England. Looking into the coefficients in the test results, it is seen that the effect of risk premiums on stock market indices for all countries is greater than the effect of Covid-19 cases.

Conclusion

Covid-19 pandemic is a global humanitarian crisis that has had an unprecedented extent of damage to the global economy, shrinking production and consumption around the world. It has affected both the economic structure and international trade patterns. The measures taken to mitigate the impact have placed a serious burden on countries in the fields of economy and health all around the whole world. These measures can be classified as short, medium and long term, giving way to production losses resulting from the economic slowdown caused by the cost of reducing cases and deaths and the precautions taken in the lack of vaccines and effective treatment.

Some countries reacted to the circumstance by restricting their imports from China, which is considered as the main source of pandemic outbreak. Some countries had to restrict their foreign trade by imposing export restrictions on health and food products that are strategically important to them (Khaldun et al., 2021). Considering the studies conducted during the pandemic period, it is seen that the researchers did not have comprehensive data set to make predictions with respect to the depth of uncertainties the period held in store. We see that the measures and incentives taken by the countries where the studies were conducted within the first year of the period drew more optimistic scenarios, pointing to a serious recovery trend. China seems to be the leading country in the recovery process (Wang et al., 2022). It was estimated that China, a significant manufacturer, would close 2021 with a serious growth rate. Moreover, It was predicted to have solved its problems of providing its goods for overseas countries by the end of 2021.

The study aims to examine the effect of Covid-19 case numbers and risk premiums on stock market indices. In this context, the analysis was carried out using data sets of exchange rates, country risk premiums and the number of Covid-19 cases on selected countries, which are the United States, France and England, between February 3, 2020 and September 20, 2021. The findings of the study indicate that the risk premiums of countries and the number of Covid-19 cases have a negative effect on stock market indices in all countries. The effect of exchange rates on stock market indices is negative for the United Kingdom and the United States. It was found out that the effect of risk premium, Covid-19 cases and exchange rates on the stock market index in the UK is negative. The country suffering from the severest degree of the impact of Covid-19 cases on stock market indices is England. The findings also show that the country with the lowest risk premiums on stock market indices is England and the country with the highest is the United States. Furthermore, the country with the harshest effect of exchange rates on its stock market indices is France and the country with the softest is England.

The negative effect of Covid-19 cases on stock market indices as detected by the present study complies with the literature (Topcu and Gulal, 2020). Similarly, the negative effect of risk premiums on stock market indices is consistent with the literature. Anton & Afloarei Nucu (2020) stated in their study that there was a strong two-way causality relationship between countries' risk premiums and stock market indices. In addition, Chan et al. (2009) mentioned in their study that there was a strong negative correlation between risk premiums and stock market indices. Our findings on the stock market indices of exchange rates are negative for the United States and the United Kingdom, but positive for France. Kollias et al. (2012) stated in their research that there was a time-varying causality relationship between exchange rates and stock market indices. Sensoy et al. (2014) indicated that the relationship between exchange rates and stock market returns is stronger in times of crisis, in both directions. Since the effect of risk premiums on stock market indices is stronger in the United States and England, the effect of exchange rates is negative. On the other hand, we acknowledge that the effect of exchange rates is positive for France since the effect of risk premiums on stock market indices is weak.

The study suggests that the effect of risk premiums arising from the uncertainty on stock market indices is higher than the effect of Covid-19 cases. In conclusion, upon the analysis of the macroeconomic effects of the pandemic period, it is understood that the covid epidemic imposes serious economic costs on countries. The measures taken by the countries caused the closure of workplaces or the reduction of working hours. The restriction of workplaces caused losses of job and lack of new job opportunities for workers, resulting in a serious decrease in the income of the employees. Although the degree of the impact of the pandemic in each country is different with the distinctive measures and restrictions taken, it also varies in relation to respective sectors. The services sector and tourism sector are emerging as the sectors most severely affected by the pandemic. The disruption of the production of countries caused the disruption of all supply chains and the disruption of global trade. Financial markets have been the area most rapidly affected by the pandemic period. The main reason for this situation is the economic fluctuations created by the environment of uncertainty.

The negative effect of uncertainty on financial markets is greater than the effect of the number of Covid-19 cases. With the emergence of different mutations of the virus, the formation of second and third waves have increased the uncertainty regarding how long the fluctuation will last. The environment of increasing obscurity continues to exert negative pressure on financial markets. Consequently, countries should make policies to reduce the uncertainty stemming from the pandemic in order to reduce and reverse the negative pressure on financial markets. It is thought that there are three options that countries should follow. These are the strict

pandemic practices followed by China, the herd immunity and vaccination method followed by the UK, and finally a serious vaccination program followed by Israel. Since not every country may not have the same opportunity to access vaccines, it is important for countries to stop the spread of the virus with more severe restrictions and rather than weak ones to prevent the economy from being battered.

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GENİŞLETİLMİŞ ÖZET

COVID-19 veya tam adıyla koronavirüs hastalığı 2019, şiddetli akut solunum sendromu koronavirüs 2'nin (SARS-CoV-2) neden olduğu, insanları etkileyen bulaşıcı bir solunum hastalığıdır. Corona virüsü, Aralık 2019'da Çin'in Hubei eyaletinin Wuhan kentinde başlayarak tüm dünyaya hızla yayıldı. Salgın, seyahat kısıtlamaları, sokağa çıkma yasakları, ücretsiz izin uygulamaları ve çalışma saati düzenlemeleri ile hane halkı gelirinin azalması nedeniyle hem üretimi hem de talebi etkileyen bir boyut kazanmıştır. Çalışmamızın motivasyonu, pandemi vakalarının ve pandemi kaynaklı belirsizliğin finansal piyasalar üzerindeki etkisini tespit etmektir. Çalışmamızın amacı, Covid-19 vakalarının ve CDS primlerinin borsa endeksleri üzerindeki etkinin derecesini ve yönünü incelemektir. Etkin bir analiz yapabilmek amacıyla finansal piyasalarda derinliğe sahip gelişmiş ülkeler üzerine odaklanılmıştır. Veri kısıtlamaları da göz önüne alınarak İngiltere, Fransa ve Amerika Birleşik Devletleri seçilmiştir.

Çalışmamızın modeli, Topcu and Gulal (2020)'ın uyguladıkları analizi takiben geliştirilmiştir. Onların uyguladıkları modelde, döviz kurları, Covid-19 vakaları ve petrol fiyatlarının borsa getirileri üzerine etkilerini analiz etmişlerdir. Gelişmekte olan piyasalardan 26 ülke üzerinde yaptıkları çalışmada Covid-19 vakalarının borsa endeksi üzerinde negatif etkiye sahip olduklarını ifade etmişlerdir. Onların modeline benzer olarak, seçili gelişmiş ülkelerde Covid-19 vakalarının borsa endeksileri üzerine etkisi incelemektedir. Temel fark, modele ülkelerin risk primlerinin de dâhil edilmesidir. Derlenen verilerin analizinde, Merlin ve Chen (2021)'in çalışmalarında kullandıkları ekonometrik yöntem takip edilmiştir. Serilerin durağanlığını belirlemek amacıyla ADF, PP ve KPSS LM birim kök testleri uygulanmıştır. Birinci dereceden durağan duruma ulaşan seriler arasında uzun dönemde eş bütünleşme ilişkisinin varlığını incelemek üzere Johansen eşbütünleşme testi kullanılmıştır. Değişkenler arasında uzun dönemde eşbütünleşme ilişkisinin ortaya çıkmasından dolayı tespit edilmesi üzerine, değişkenler arasındaki ilişkinin yönü ve büyüklüğünü ortaya çıkarmak için FMOLS, DOLS ve CCR yöntemleri uygulanmıştır.

FMOLS, DOLS ve CCR test sonuçları incelendiğinde, bütün ülkelerin risk primlerinin borsa endeksleri üzerinde negatif etkiye sahip olduğu görülmektedir. Benzer olarak, bütün ülkelerde Covid-19 vakalarının borsa endeksleri üzerinde negatif etkiye sahip olduğu görülmektedir. İngiltere ve Amerika Birleşik Devletleri için döviz kurlarının borsa endeksleri üzerine negatif etkiye sahip olduğu görülmektedir. İngiltere'de risk primi, covid vakaları ve döviz kurlarının borsa endeksi üzerine etkisinin negatif olduğu görülmektedir. Covid-19 vakalarının borsa endeksleri üzerinde etkisinin en yüksek olduğu ülke İngiltere'dir. Risk pirimlerinin borsa endeksleri üzerinde en düşük olduğu ülke İngiltere ve en yüksek olduğu ülke Amerika Birleşik Devletleri'dir. Döviz kurlarının borsa endeksleri üzerinde etkisinin en yüksek olduğu ülke Fransa ve en düşük olduğu ülke İngiltere'dir. Test sonuçlarında katsayılara bakıldığında, bütün ülkeler için risk primlerinin borsa endeksleri üzerine etkisi Covid-19 vakalarının etkisinden daha büyük olduğu görülmektedir.

Covid-19, küresel bir insani krizdir ve küresel ekonomiye çok ciddi zararlar vermiştir. Pandemi, üretim ve tüketimi dünya çapında azaltarak hem ekonomik yapıyı hem de uluslararası ticaret modellerini etkilemiştir. Alınan tedbirler tüm dünyada olduğu gibi ekonomi ve sağlık alanlarında da ülkelere ciddi bir maliyet getirmiştir. Bu maliyetler, vaka ve ölümlerin azaltılması için uygulanan ekonomik yavaşlama ve etkin tedavi (aşı) eksikliğinde alınan önlemlerden kaynaklanan kısa, orta ve uzun vadeli üretim kayıplarıdır. Pandemiden en hızlı ve derinden etkilenen finansal piyasalardır.

Çalışma, Covid-19 vakalarının borsa endeksleri üzerine etkisini incelemeyi amaçlamaktadır. Bu kapsamda, 3 Şubat 2020- 20 Eylül 2021 döneminde seçili Amerika Birleşik Devletleri, Fransa ve İngiltere ülkeleri üzerinde döviz kuru, ülke risk primleri ve Covid-19 vakalarına ait veri setleri kullanılarak analiz yapılmıştır. Çalışmanın bulguları, ülkelerin risk primlerinin ve Covid-19 vakalarının bütün ülkelerde borsa endeksleri üzerinde negatif etkiye sahip olduğunu göstermektedir. İngiltere ve Amerika Birleşik Devletleri için döviz kurlarının borsa endeksleri üzerine etkisi negatiftir. İngiltere'de risk primi, Covid-19 vakaları ve döviz kurlarının borsa endeksi üzerine etkisinin negatif olduğu görülmektedir. Covid-19 vakalarının borsa endeksleri üzerinde etkisinin en yüksek olduğu ülke İngiltere'dir. Risk pirimlerinin borsa endeksleri üzerinde en düşük olduğu ülke İngiltere ve en yüksek olduğu ülke Amerika Birleşik Devletleri'dir. Döviz kurlarının borsa endeksleri üzerinde etkisinin en yüksek olduğu ülke Fransa ve en düşük olduğu ülke İngiltere'dir.

Covid-19 vakalarının borsa endeksleri üzerine etkisinin negatif olması literatürle uyum sağlamaktadır (Topcu and Gulal, 2020). Benzer olarak, risk primlerinin borsa endeksleri üzerine negatif etkisi literatürle uyumludur. Anton & Afloarei Nucu (2020) çalışmalarında, ülkelerin risk primleri ve borsa endeksleri arasında iki yönlü güçlü bir nedensellik ilişkisi olduğunu ifade etmişlerdir. İlave olarak, Chan, Fung ve Zhang (2009) çalışmalarında risk primleri ve borsa endeksleri arasında güçlü bir negatif korelasyon olduğunu ifade etmişlerdir. Döviz kurlarının borsa endeksleri üzerine bulgularımız, Amerika Birleşik Devletleri ve İngiltere için negatif iken Fransa için pozitif etkiye sahiptir. Kollias vd. (2012) çalışmalarında döviz kurları ile borsa endeksleri arasında zamanla değişen bir nedensellik ilişkini ifade etmişlerdir. Sensoy et al. (2014) çalışmalarında, döviz kurları ile borsa getirileri arasındaki ilişkiyi iki yönlü olarak kriz dönemlerinde daha güçlü olduğunu ifade etmişlerdir. Amerika Birleşik Devletleri ve İngiltere'de risk primlerinin borsa endeksleri üzerine etkisi daha güçlü olduğundan döviz kurlarının etkisi negatif ve risk primlerinin borsa endeksleri üzerine etkisi zayıf olduğundan Fransa için döviz kurlarının etkisinin pozitif olduğunu görmekteyiz. Sonuç olarak, belirsizlikten kaynaklı risk primlerinin borsa endeksleri üzerine etkisi Covid-19 vakalarının etkisinden daha yüksektir.

Virüsün farklı mutasyonlarının ortaya çıkmasıyla birlikte ikinci ve üçüncü dalgaların oluşması, dalgalanmanın ne kadar süreceği konusundaki belirsizliği artırmaktadır. Artan belirsilik ortamı finansal piyasalar üzerinde negatif baskıyı sürdürmektedir. Bu nedenle ülkeler, pandeminin oluşturduğu belirsizlik ortamını azaltıcı politikalar izlemesi önerilmektedir. Virüsün ilk ortaya çıktığı ülke olan Çin, ciddi kısıtlama önlemleri alarak virüsün yayılmasını engelleyerek 2020 yılını pozitif büyüme (%2.3) ile kapatmış ve 2021 içinde yüzde 8 büyüme beklentisine sahip durumdadır. Ancak virüs kendi ülkesinde yayılmaya başladığında gerekli önlemleri uygulamada gevşek kalması sonucunda pandemiden en çok etkilenen ülke ABD'dir. Aşılama konusunda en başarılı ülkeler olarak İsrail ve Birleşik Arap Emirlikleri pandemi sürecini başarıyla yürütmektedirler. Diğer taraftan, İngiltere sürü bağışıklığı ve aşılama yöntemini takip ederek %70'in üzerinde antikor oluşumuna neden olarak ciddi ilerleme kaydetmiştir. Bu nedenle ülkelerin takip etmesi gereken üç seçenek olduğu düşünülmektedir. Bunlar, Çin ülkesinin takip ettiği sıkı pandemi uygulamaları, İngiltere'nin takip ettiği sürü bağışıklığı ve aşılama yöntemi ve son olarak İsrail'in takip ettiği ciddi bir aşılama programıdır. Her ülkenin aşıya ulaşma konusunda aynı imkâna sahip olmadığından ülkeler ekonomiye zarar vermemek için zayıf kısıtlamalar yapmak yerine daha ağır kısıtlamalar ve aşılama faaliyetleriyle virüsün yayılmasını durdurması önemlidir.