IMPACT OF COVID 19 ANNOUNCEMENTS AND GOVERNMENT RESTRICTIONS ON CDS PREMIUMS OF BRICS-T COUNTRIES [*]

COVID-19 DUYURULARININ VE HÜKÜMET KISITLAMALARININ BRICS-T ÜLKELERİNİN CDS PRİMLERİ ÜZERİNDEKİ ETKİSİ

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Abstract: In this study, the impact of changes in the number of Covid-19 cases and deaths, as well as government restrictions taken to reduce the spread of the pandemic, on the CDS premiums of BRICS-T countries, which are risk indicators, were examined. The data for the study include the number of deaths and cases as Covid-19 announcements, the stringency index calculated by the Oxford Covid-19 Government Response Tracker (OxCGRT) for government restrictions, and the CDS premium prices for Brazil, Russia, India, China, South Africa, and Turkey. For he study, Kao and Pedroni cointegration tests, Dumitrescu Hurlin and Granger causality analyses, and static panel data analysis were conducted. According to the analysis results, the cointegration tests indicate a long-term relationships between CDS premiums and case, death, strigency index of BRICS-T countries. According to the causality test results, a causal relationship from government restrictions to country CDS premiums, while no relationship could be determined from the number of cases and deaths. The static panel analysis results indicate that only government restrictions have a positive and significant effect on CDS premiums. In conclusion, the study shows that the increase in restrictions, along with the pressure of government restrictions on the economic system, increases the risk of emerging and developing countries.

Keywords: : BRICS-T, CDS Premiums, Covid-19, Government Restrictions

JEL: G10, G15, F30

Öz: Bu çalışmada, Covid-19 küresel salgını döneminde BRICS-T ülkelerinin risk göstergesi olan CDS'lerin, Covid-19 vaka ve ölüm sayılarındaki değişimden ve salgının bulaşma oranını azaltmak için alınan hükümet kısıtlamalarından nasıl etkilendiği incelenmiştir. Çalışmanın verisi olarak Covid-19 duyuruları olarak ölüm ve vaka sayıları, hükümet kısıtlamaları için Oxford Covid-19 Government Response Tracker (OxCGRT) tarafından hesaplanan sıkılık endeksi ve Brezilya, Rusya, Hindistan, Çin, Güney Afrika ve Türkiye CDS prim fiyatları kullanılmıştır. Çalışmada Kao ve Pedroni eşbütünleşme testi, Dumitriscu Hurlin ve Granger nedensellik analizleri ve statik panel veri analizi yapılmıştır. Analiz sonuçlarına göre, eşbütünleşme testleri BRICS-T ülkelerinin CDS primleri ile vaka, ölüm ve sıkılık endeksi arasında uzun vadeli bir ilişki olduğu belirlenmiştir. Nedensellik testi sonuçlarına göre, hükümet kısıtlamalarından ülke CDS primlerine doğru nedensel bir

ilişki tespit edilirken, vaka ve ölüm sayılarına ilişkin herhangi bir ilişki belirlenememiştir. Statik panel analizi sonucunda ise sadece hükümet kısıtlamalarının CDS primleri üzerinde pozitif ve anlamlı bir etkisi olduğu belirlenmiştir. Sonuç olarak devlet kısıtlamalarının ekonomik sistem üzerindeki baskısı ile birlikte kısıtlamaların artmasının, gelişen ve gelişmekte olan ülkelerin riskini de artırdığını göstermektedir

Anahtar Kelimeler: *BRICS-T, CDS Primleri, Covid-19, Hükümet Duyuruları*

1. Introduction

The world population has faced five significant epidemic diseases (pandemics) in the 21st century. The H1N1 virus, which emerged in 2009, was followed by the Ebola and polio outbreaks in 2014, the Zika virus in 2016, and, most recently, the Covid-19, declared as a global pandemic by the World Health Organization (WHO) in December 2019, originating in Wuhan, China, and affecting the entire world. These pandemics represent the major health crises humanity has encountered in the first two decades of the 21st century. Notably, the Covid-19 pandemic stands out as the most significant health catastrophe faced by mankind since World War II (Duran & Acar, 2020).

As of December 2023, a total of 772 million confirmed cases and nearly 7 million deaths have been attributed to the Covid-19 pandemic globally (WHO, 2023). These figures underscore the profound impact of Covid-19 within a relatively short period of 2-3 years.

In addition to its health implications, the designation of Covid-19 as a pandemic by the World Health Organization has resulted in devastating economic and social consequences. Measures such as quarantine, international restrictions, and social isolation have not only posed health challenges but have also precipitated significant economic and social problems for countries. Disruptions in supply chains, particularly, have led to a substantial contraction in economic activities (Bayraktar, 2020). The global repercussions of the Covid-19 pandemic have caused production halts and business closures across various sectors, substantial reductions in consumption, and a subsequent increase in unemployment. The resulting economic impacts have been significantly felt between nations, affecting financial markets adversely (Özdemir, 2020). These developments have naturally influenced risk perceptions in markets.

Remarkably, the recent surge in market risk perception is unprecedented, triggered by a health crisis. The Dow Jones Industrial Average experienced two of its largest single-day declines in March 2020, while the S&P 500 index witnessed a nearly 41% decline between February and March 2020. In Turkey, the BIST 100 index suffered a daily decline of over 5% in March 2020, marking the highest value loss since July 2016. Additionally, Turkey's CDS premiums reached their peak at 652 points in April 2020 (Vurur, 2021).

Subsequent to the pandemic, the increase in countries facing economic challenges has brought CDS premiums to the forefront. Investors, in an attempt to secure their investments, may opt to insure against the non-payment risk of their government bonds by entering into CDS contracts. CDS-selling entities, in turn, compensate bondholders in the event of default, functioning as a form of insurance for credit and financial systems. The term "CDS premium" refers to the payments made to the entity selling the CDS contract. These contracts serve to protect investors from the risk of

bond default (Demirhan, 2020). The volatility in CDS premiums may be interpreted as an indicator of increased investment risk perceptions for countries.

In summary, CDS plays a crucial role as a determinant of country and firm risk. During the pandemic, numerous developments affected risk perceptions, especially in emerging economies. Factors such as variations in the speed of disease spread, governmental interventions, vaccine discovery, the prominence of certain sectors in the economy, negative impacts on other sectors, the widespread adoption of remote working systems, and lockdowns were among the significant elements. This study aims to investigate the impact of interventions and measures taken by countries due to the Covid-19 pandemic on CDS premiums, examining how these extraordinary regulations have influenced risk perceptions on countries. Given the vulnerability of risk perceptions in developing economies and the varying degrees of economic impact on these nations during the pandemic, the study focuses on the BRICS-T countries, namely Brazil, Russia, India, China, South Africa, and Turkey, which have exhibited particularly noteworthy economic developments in recent times (İlhan & Bayır, 2021).

2. Literature

According to the BIS (2021) report, the financial products most traded in the credit derivative market and making up the majority of this market are CDS. Merton (1974) provides accurate information about the risk situations of companies and countries, as the change in CDS prices reflects the debt and default situation. CDS premiums, first introduced by JP Morgan Chase in 1995, are considered an important measure of the riskiness of countries, especially developing countries (Risks and Soundness, 2008). For this reason, changes in CDS premiums and what affects them are important for politicians, academics and investors. Uncertainties can be shown as the most important reason for the fluctuations of CDS premiums. These uncertainties are triggered by events such as crises, wars, epidemics, political problems and disasters. Covid-19, which first appeared in China in late 2019 and spread all over the world, brought about a health crisis with the declaration of a pandemic. It has turned into an economic and social crisis with the measures taken along with the health crisis and government restrictions. Therefore, it is important to assess how the uncertainties existing during the Covid-19 period affect the riskiness of emerging markets.

Especially after the 2008 crisis, the collapse and damage of companies that were given high scores by credit rating companies drew attention to CDS premiums. After the 2008 crisis, many studies were conducted on CDS premiums. (Das et al., 2009; Forte and Pena 2009 Ammer and Cai, 2011; Sapir et al., 2014; Kajurova, 2015; Shahzad et al., 2017; Pelster, 2018). With these studies, CDS premiums have been examined from different perspectives. Forte and Pena (2009) investigated the relationship between stock markets and CDS premiums. Ericsson (2009) showed what factors affect the change in CDS premiums. Baum and Wan (2010) investigated the impact of macroeconomic uncertainty on CDS premiums. With a different approach, Miyakawa and Watanabe (2014) revealed the interaction of changes in CDS premiums in terms of supply and demand. Ho (2016) revealed what are the short and long-term determinants of CDS premiums in emerging markets. CDS premiums were examined from many aspects after the 2008 crisis, and a new dynamic emerged after Covid-19 affected the whole world. Since Covid-19 is the largest epidemic experienced in the modern world, it has left deep effects on health, economy and social life. The impact of uncertainties in many areas on CDS premiums has also been a matter of curiosity.

Therefore, in this study, the impact of the Covid-19 process and the measures taken by states in this process on CDS premiums in emerging markets were investigated.

Andries et al. (2021), in their study where they investigated the effect of Covid-19 on the change in 5-year CDS premiums of all European countries, stated that the increase in the number of cases and deaths increased CDS premiums. They also showed that as government restrictions increase, this also increases the negative impact. Cevik and Öztürkkal (2021), in their analysis of daily data reflecting the number of cases and deaths in their sample of 77 developed and developing countries, revealed that Covid-19 affected the CDS premiums of all countries. On the other hand, this effect was more evident in developed countries. Pan et al., (2021), in their study investigating the effect of the change in the daily number of Covid-19 cases on CDS premiums in 78 countries, found that, on average, a 1% change in the number of cases caused a 0.17% change in CDSs, with its effect being observed in developing countries. They proved to be more powerful. They also stated that state policies can partially offset this effect.

In their studies for Latin American and Asian countries, Będowska-Sójka and Kliber (2022) stated that government restrictions against Covid-19 generally increased the risk and volatility of the country. Erer (2022) discussed Turkey, Italy, Spain, England and the USA in his study. It has been revealed that the government measures taken during the Covid-19 period increased the volatility of CDS premiums especially in Turkey, Italy and Spain. On the other hand, this volatility decreased in Turkey with the supportive measures put forward. He stated that the USA's CDS premiums were unresponsive to both restrictions and supports. Daehler et al. (2020) examined developing countries in their study and showed that factors related to Covid-19 had an impact on CDS premiums in the first months of 2020, but in the following months, macroeconomic policies were more determining factors of CDS premiums than Covid-19-related risks. Procasky and Yin (2023) approached their study from a different perspective and compared the reactions of stock markets and CDS premiums to the Covid-19 process. They revealed that a significant structural break occurred in both markets with the Covid-19 process and investors reacted differently compared to the past. However, they also stated that the break in the stock market was sharper than in the CDS market.

3. Dataset and Methodology

In this study, the BRICS structure, which was established to represent emerging and developing markets, was transformed into BRICS-T with the addition of Turkey, which is a candidate country and has a place in the literature. Thus, Brazil, Russia, India, China, South Africa and Turkey were included in the study. This group of countries is important both because they have their own economic and financial systems among developing countries and also because they are candidates for the group of developed countries. However, since these countries are exposed to various risks compared to developed countries, their risk structures are also a matter of curiosity. For this reason, the study investigated how CDS premiums, which are an indicator of country risk and have a dynamic structure with daily data, are affected, especially during the Covid-19 period. While death and case numbers were used as Covid-19 announcements, the stringency index calculated by the Oxford Covıd-19 Government Response Tracker (OxCGRT) was used for government restrictions. There are 9 subcomponents in the calculation of this index. These components cover the restriction and closure decisions taken by states against Covid-19. The

combination of decisions made regarding workplace, school, public transportation, travel and events creates the index. Datasets were obtained daily from Refinitiv Datastream and Ourworldindata databases. The data were revised by determining the cases, deaths and first restriction dates of each country and taking into account holidays on a country basis.

In the study, the impact of Covid-19 announcements and government restrictions on CDS premiums was investigated. Case, death and first restriction dates of the countries used in the study are presented in Table 1

Table 1. Historical Information about the Data Set

Countries	First Case	First Death	First Restriction
Brazil	26.02.2020	17.03.2020	26.02.2020
Russia	31.01.2020	19.03.2020	31.01.2020
India	30.01.2020	11.03.2020	30.01.2020
China	22.01.2020	22.01.2020	22.01.2020
South Africa	05.03.2020	27.03.2020	07.02.2020
Turkiye	11.03.2020	17.03.2020	11.03.2020

After historical information of the data sets used in the study is given, the calculation methods of the data sets used in the study and the abbreviations used in the tables are shown in Table 2.

Table 2. Variables and Abbreviations Used in the Study

Variables	Description	Abbreviation
CDS Premiums of BRICS-T Countries	Logarithmic changes of countries' CDS premiums based on daily data	CDS
Number of Cases in BRICS-T Countries	Logarithmic changes in the number of cases of countries based on daily data	Case
Number of Deaths in BRICS-T Countries	Logarithmic changes in the number of deaths of countries based on daily data	Death
Stringency Index Values of BRICS-T Countries	Logarithmic changes of government restriction values of countries calculated based on daily data	Stringency

To ensure stationarity in all data before starting the analysis in the study; Fisher ADF (Maddala and Wu, 1999), Fisher Philips Perron (Choi, 2001), Levin, Lin and Chu (2002), Im, Pesaran and Shin (2003), unit root tests were used. After stationarity was achieved, Pedroni (1999) and Kao (1999) cointegration analyzes were used to investigate the existence of a long-term relationship between the variables. With panel Granger causality analysis based on Granger (1969) and Dumitrescu and Hurlin (2012) causality analysis, the causality relationship between Covid-19 announcements and government restrictions on country CDS premiums was investigated. Finally, to determine which panel data model is suitable for BRICS-T countries, Hausman and F tests were performed and the analyses were completed by selecting the appropriate pool model, fixed effect model and random effect models.

The model of the study is as follows;

$$CDS_{it} = \alpha_{it} + \beta_1(Case_{it}) + \beta_2(Death_{it}) + \beta_3(Strigency_{it}) + +\epsilon_{it} \qquad (1)$$

CDS= CDS Premiums of BRICS-T Countries
Case= Number of Cases in BRICS-T Countries
Death= Number of Deaths in BRICS-T Countries
Stringency= Stringency Index Values of BRICS-T Countries
α_{it}: Constant term.
β_1, β_2 ve β_3: Coefficients of independent variables.
ϵ_{it}: Error term

4. Results

In the study, before analyzing the models, the stationarity of the data sets used was examined with panel unit root tests and is presented in Table 3. As unit root tests in the study; ADF-Fisher, PP-Fisher, Levin-Lin and Chu (LLC) and Breitung, Im-Pesaran and Shin (IPS), unit root tests were used.

Table 3. Panel Unit Root Tests

	LLC	IPS	ADF-Fisher	PP-Fisher
	Level			
CDS	-32,4321*	-54,1094*	631,377*	864,127*
Case	-12,1213*	-15,2759*	356,021*	245,108*
Death	-13,7602*	-10,0875*	237,158*	165,376*
Strigency	-4,3210*	-6,3246*	120,3259*	89,3445*

Note: * indicates significance at 1%.

Looking at the results of the panel unit root tests in Table 3, it can be seen that all of the data sets used for BRICS-T countries are significant at 1% according to 4 different unit root tests and do not contain a unit root problem. Thus, all variables used in the study are stationary at I(0) level value. After checking the stationarity of the variables used in the study, Pedroni and Kao cointegration tests were performed to measure the long-term interaction of CDS premiums in BRICS-T countries, the number of cases and deaths resulting from the Covid-19, and the restrictions imposed by governments to prevent this, and are presented in Table 4.

Table 4. BRICS-T Countries CDS Premiums Pedroni and Kao Cointegration Tests

Pedroni Cointegration Test						
	Panel			Group		
	V	Rho	PP	ADF	Rho	PP	ADF
Case	50,81*	-461,11*	-85,20*	-54,04*	-421,25*	-99,98*	-64,89*
Death	20,53*	-456,80*	-84,72*	-54,67*	-415,77*	-99,40*	-63,54*
Strigency	9,85*	-465,26*	-85,51*	-54,41*	-425,20*	-100,37*	-64,29*
Kao Cointegration Test						
Case						
	T Stat.			Prob.		
ADF	-40.24001			0.0000		

Death		
	T Stat.	**Prob.**
ADF	-29,7342	0.0000
Strigency		
	T Stat.	**Prob.**
ADF	-24,2495	0.0000

Note: * indicates significance at 1%.

In Table 4, cointegration tests were performed to determine the long-term relationship between the CDS premiums of the BRICS-T countries and the number of Covid-19 cases and deaths with the government restrictions and measures of the BRICS-T countries during the pandemic. According to the Pedroni and Kao cointegration results, it is seen that the variables used are significant at the 1% level. Therefore, we can talk about a long-term interaction of cases, deaths and government restrictions on CDS premiums throughout the pandemic period. To reveal the causality relationship between CDS premiums and the variables used, Granger and Dumitrescu-Hurlin causality analyzes were conducted and shown in Table 5.

Table 5. BRICS-T Countries Panel Causality Tests

Granger Causality Test		
	F Statistics	**Probability**
Case – CDS	2.00085	0.1343
Death- CDS	0.13050	0.8777
Strigency- CDS	2.3761	0.049
Dumitrescu Hurlin Causality Test		
	Zbar Statistics	**Probability**
Case – CDS	-0.5493	0.5828
Death- CDS	-1.1389	0.2547
Strigency- CDS	1.8842	0.0795

According to the causality test results in Table 5, there is no evidence that the increase in the number of Covid-19 cases and deaths has a significant causal relationship on the CDS premiums of BRICS-T countries. However, according to both causality tests, a causal relationship between government restrictions on CDS premiums was determined. While this relationship is significant at 5% in the Granger causality analysis, it is seen to be significant at 10% in the Dumitriscu-Hurlin causality analysis. With the cointegration tests, it was determined that there was a long-term interaction between CDS premiums, cases, deaths and government restrictions, but in the causality analysis, it was determined that there was only a significant effect from state restrictions to CDS premiums. However, these analyses do not provide information about the direction of the relationships, and panel modeling is required for this. Before performing panel analysis, it is important to determine which panel data model (Pooled Model-Fixed Effects Model-Random Effects Model) is appropriate. F test and Hausman test were performed to determine which panel data model is appropriate and are presented in Table 6.

Table 6. Panel Model Selection

	Fixed Effects	Random Effects
F Test	89,4209 (0,0000)	
Hausman		43,3801 (0,0000)

Looking at the F test results in Table 6, it appears to be significant at 1%. Thus, the fixed-effect model was found to be more appropriate than the pooled model. The Hausman test result, which was performed to select the appropriate model between the fixed effect model and the random effect model, is also significant at 1%. A fixed-effect panel data model was chosen as most appropriate to the model established to determine the impact of Covid-19 announcements and government restrictions on the CDS premiums of BRICS-T countries. The fixed effect model results established for BRICS-T countries are presented in Table 7.

Table7. BRICS-T Countries CDS Premiums Fixed Effect Panel Data Model Results

	Coefficient	Std. Error	T Statistics	Probability
Case	-1.19E-07	2.34E-05	-0.005086	0.9959
Death	1.56E-05	2.81E-05	0.556503	0.5779
Strigency	5.19E-05	3.00E-05	-1.731030	0.0835
C	8.86E-05	0.000261	0.339071	0.7346

According to the fixed-effect panel data model results in Table 7, no significant relationship between the CDS premiums of BRICS-T countries and the number of Covid-19 cases and deaths could be detected. Only government restrictions have a significant and positive effect at 10%. As restrictions increase, it creates a negative pressure on countries' CDS premiums.

5. Conclusion

In the study, the impact of Covid-19 announcements and government restrictions on CDS premiums of BRICS-T countries during the Covid-19 period was investigated. As in other crises, there has been a serious pressure on the markets during the pandemic, so it is important to reveal the impact of the pandemic on emerging and developing markets. To determine this impact, the case, death and first restriction dates of each country were determined and data sets were prepared for each country according to these dates. After the data sets in the study were made stationary, long-term relationships were first investigated. According to the results of Kao and Pedroni cointegration tests, it was determined that there is a long-term relationship. Then, Dumitriscu Hurlin and Granger causality analyses were conducted to determine the causality relationship from Covid-19 announcements and government restrictions to CDS premiums. According to both test results, while a causal relationship was detected from government restrictions to country CDS premiums, no relationship could be determined from the number of cases and deaths. Finally, appropriateness tests were conducted to determine the most appropriate panel data analysis for the

study model. According to the Hausman and F tests, the fixed effects model was selected as the appropriate model. As a result of the analysis, only the positive and significant effect of government restrictions on CDS premiums was determined. When compared with the existing literature, similar results have been observed. The impact of Covid-19 was identified in both developed and developing countries studied by Çevik and Öztürkkal (2021), as well as in developing countries according to Pan et al. (2021) and Deahler et al. (2020). In the BRICS-T countries addressed in this study, the effect of Covid-19 on CDS spreads has also been observed. Regarding government restrictions, a strong effect on CDS spreads was detected, consistent with the findings of Będowska-Sójka and Kliber (2022) and Erer (2022).

After Covid-19 was declared a pandemic in a short time, it pushed countries to take rapid measures. The pandemic has deeply affected economic and social life, especially the healthcare system. The fact that countries were caught unprepared for the epidemic caused the measures to be deepened day by day, which consequently had a deep impact on financial markets, especially with negative expectations about the future. This impact was felt more in underdeveloped and developing countries. For this reason, in this study, BRICS-T countries were selected to represent emerging and developing markets. They are more exposed to risks compared to developed countries whilst having a more established economic and financial structure than other developing countries. It has been investigated how CDS premiums, which allow a precise daily assessment of the riskiness of countries, are affected. When the analyses were evaluated collectively, it was seen that CDS premiums were affected by the change in the number of Covid-19 cases and deaths and the change in government restrictions during the pandemic period, but the main effect came from government restrictions. Government restrictions have affected functions such as transportation, supply and logistics, causing production and service processes to be disrupted, reduced and stopped in some sectors. This interaction has likely contributed to rising unemployment, disruptions in payment processes, and added economic and social pressures on states, in addition to straining the healthcare system. In summary, the increase in cases and deaths has placed significant pressure on healthcare systems, while the rise in government restrictions may have affected economic and financial markets. The study suggests that the escalation in restrictions, coupled with the pressures from state-imposed measures on the economic system, may have also heightened financial risks for emerging and developing countries

References

Ammer, J., & Cai, F. (2011). Sovereign CDS and bond pricing dynamics in emerging markets: Does the cheapest-to-deliver option matter?. *Journal of International Financial Markets, Institutions and Money, 21*(3), 369-387.

Andrieş, A. M., Ongena, S., & Sprincean, N. (2021). The Covid-19 pandemic and sovereign bond risk. *The North American Journal of Economics and Finance, 58,* 101527.

Bank for International Settlements (2021).OTC derivatives statistics at end-June2021, Available Online: https://www.bis.org/publ/otc_hy2111.htm.

Baum, C. F., & Wan, C. (2010). Macroeconomic uncertainty and credit default swap spreads. *Applied Financial Economics*, *20*(15), 1163-1171.

Bayraktar, A. (2020). Covid-19 Pandemisinin Finansal Etkileri: BİST İmalat Sektörü Uygulaması. *Turkish Studies, 15*(8), 3415-3427.

Będowska-Sójka, B., & Kliber, A. (2022). Impact of Covid-19 on sovereign risk: Latin America versus Asia. *Finance Research Letters*, *47*, 102582.

Cevik, S., & Öztürkkal, B. (2021). Contagion of fear: Is the impact of Covid-19 on sovereign risk really indiscriminate?. *International Finance*, *24*(2), 134-154.

Choi, I. (2001). Unit root tests for panel data. *Journal of İnternational Money and Finance*, *20*(2), 249-272.

Daehler, T., Aizenman, J., & Jinjarak, Y. (2020). Emerging Markets Sovereign Spreads And Country-Specific Fundamentals During Covid-19. https://coilink.org/20.500.12592/fnj5fb

Das, S. R., Hanouna, P., & Sarin, A. (2009). Accounting-based versus market-based cross-sectional models of CDS spreads. *Journal of Banking & Finance*, *33*(4), 719-730.

Demirhan, E. (2020). "Covid-19 Küresel Salgınının Türkiye CDS Primlerine ve BİST 100 Endeksine Etkisi", *Türkiye Ekonomi Politikaları Araştırma Vakfı, WP202001*.

Dumitrescu, E. I., & Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. *Economic modelling*, *29*(4), 1450-1460.

Duran, M.S. ve Acar, M. (2020). "Bir Virüsün Dünyaya Ettikleri: Covid-19 Pandemisinin Makroekonomik Etkileri", *International Journal of Social and Economic Sciences, 10*(1), 54-67.

Dünya Sağlık Örgütü. (2023). "WHO Coronavirus (Covid-19) Dashboard", http://Covid-19.who.int . Erişim: 06.12.2023

Erer, D. (2022). The Asymmetrıcal Impact Of Policy Responses On Volatility Of Sovereign Default Swaps. *Financial Studies*, *26*(3).

Ericsson, J., Jacobs, K., & Oviedo, R. (2009). The determinants of credit default swap premia. *Journal of financial and quantitative analysis*, *44*(1), 109-132.

Forte, S., & Pena, J. I. (2009). Credit spreads: An empirical analysis on the informational content of stocks, bonds, and CDS. *Journal of Banking & Finance, 33*(11), 2013-2025.

Galil, K., Shapir, O. M., Amiram, D., & Ben-Zion, U. (2014). The determinants of CDS spreads. *Journal of Banking & Finance*, *41*, 271-282.

Granger, C. W. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica: journal of the Econometric Society*, 424-438.

Ho, S. H. (2016). Long and short-runs determinants of the sovereign CDS spread in emerging countries. *Research in International Business and Finance, 36,* 579-590.

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of econometrics*, *115*(1), 53-74.

İlhan, B. ve Bayır, M. (2021). "BİST Sınai ve BİST Mali Endeksi ile CDS, Faiz, Döviz Kuru, Toplam Krediler ve Covid-19 Arasındaki Dinamik İlişki", *Üçüncü Sektör Sosyal Ekonomi Dergisi, 56*(4), 3090-311

Kajurova, V. (2015). The determinants of CDS spreads: The case of UK companies. *Procedia economics and finance*, *23*, 1302-1307.

Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. *Journal of econometrics*, *90*(1), 1-44.

Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of econometrics*, *108*(1), 1-24.

Maddala, G.S. and Wu, Shaowen, (1999), A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test, *Oxford Bulletin of Economics and Statistics, 61,* 631-652.

Merton, R. C. (1974). On the pricing of corporate debt: The risk structure of interest rates. *The Journal of finance*, *29*(2), 449-470.

Miyakawa, D., & Watanabe, S. (2014). What determines CDS prices? Evidence from the estimation of protection demand and supply. *International review of finance*, *14*(1), 1-28.

Özdemir, L. (2020). "Covid-19 Pandemisinin Bist Sektör Endeksleri Üzerine Asimetrik Etkisi", *Finans Ekonomi ve Sosyal Araştırmalar Dergisi, 5*(3).

Pan, W. F., Wang, X., Wu, G., & Xu, W. (2021). The Covid-19 pandemic and sovereign credit risk. *China Finance Review International*, *11*(3), 287-301.

Pedroni, P. (1999). Critical values for cointegration tests in heterogeneous panels with multiple regressors. *Oxford Bulletin of Economics and statistics*, *61*(S1), 653-670.

Pelster, M., & Vilsmeier, J. (2018). The determinants of CDS spreads: evidence from the model space. *Review of Derivatives Research*, *21*, 63-118.

Procasky, W. J., & Yin, A. (2023). The impact of Covid-19 on the relative market efficiency and forecasting ability of credit derivative and equity markets. *International Review of Financial Analysis*, *90*, 102926.

Risks, C. S., & Soundness, R. F. (2008). Global financial stability report. *International Monetary Fund, Washington*.

Shahzad, S. J. H., Nor, S. M., Ferrer, R., & Hammoudeh, S. (2017). Asymmetric determinants of CDS spreads: US industry-level evidence through the NARDL approach. *Economic Modelling*, *60*, 211-230.

Vurur, N.S. (2021). Bist 100 endeksi ile CDS Primleri arasındaki ilişkide Covıd-19 etkisi. *Uluslararası İktisadi ve İdari İncelemeler Dergisi, (31),* 97-112.