THE COVID 19 EFFECT ON MACROECONOMIC INDICATORS

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ABSTRACT

Purpose- From the moment covid 19 started to spread in the world, its effects began to be seen simultaneously in financial markets and economy.The purpose of this study is to observe Covid 19 effect on EURO/USD,gold ,oil and wheat prices.
Methodology- The database includes the Daily prices of EUR/USD, wheat ,gold , brent oil prices and COVİD 19 numbers between the period of 31.12.2019-04.09.2020 which consist of 180 daily data. Natural logaritm for each indicator is used. First, the stationarity of the series were analyzed with ADF (Augmented Dickey Fuller) unit root test. Lag lengths are determined. Interactions between the series were analyzed by theARDL, Impulse- Response Function and Variance Decomposition method.
Findings- The series are found out to not to be stationary as a result of Unit root test.After, the lag length criteria using VAR models were checked and this lag length criteria for them were determined as one . According to the ARDL test result, cointegration could not be found between our data. Impulse response graphs indicate that all variables respond in a reducing way to reducing shocks occurred in each indicator. Shocks have lost their effect on average in 2 days.
Conclusion- The results indicate that the effect of COVID 19 on EUR/USD , gold , brent oil and wheat prices do not have a strong effect. The results may be beneficial for only literatüre.

Keywords: Covid-19, pandemic, ARDL test, stationary test , impulse-response function, variance decomposition
JEL Codes: G10, G15, I10

1. INTRODUCTION

COVID-19, which started in China at the end of 2019 and spread all over the world, was defined as a global epidemic by the World Health Organization (WHO). The global epidemic was thought to threaten human life and the health system.A virus known as the corona was enough to change the entire balance of the world. The coronavirus pandemic has caused numerous deaths globally. This epidemic causes serious damage to the economic life as well as its deadly effects on public health. The pandemic is straining the health systems and economies of the most developed countries. The precautions taken due to the epidemic especially affected the economies of developing countries. Almost all of the sectors has been affected economically by COVID 19. It has adversely affected the welfare of individuals and society with the loss of income it caused. The COVID-19 outbreak seriously affects worldwide economic activities. It is expected that the epidemic will spread very rapily all over the world, leading to a significant economic crisis in the global economy.In this study, the relationship between the CODVID 19 numbers and gold, brent oil,EUR/USD and wheat daily closing priceses e in the financial market is analyzed using the VAR model. ARDL tests are conducted to evaluate the relationships between the criteria. As a result of the study, the most noticeable effect Covid 19's is on wheat prices

2. LITERATURE REVIEW

The COVID-19 outbreak is likely to cause bankruptcy for many well-known brands in many industries as consumers stay at home andeconomies are shut down (Tucker, 2020). The outbreak of the novel coronavirus Covid-19 pandemic, which is accepted as the third serious coronavirus outbreak in less than 20 years (Yang et al., 2020), COVID-19 has severely affected the real economy, with a negative impact on trade, tourism, and transport industry, generating local food shortages (Albulescu, 2020). Ramelli and Wagner and Schoenfeld (2020) explore the impacts of Covid-19 on American firms.Takahashi and Kazuo (2020) perform another firm-based analysis with Japanese firms.Al-Awadhi et al., (2020) analyze the effects of the coronavirus disease on Chinese stock market firms. Baldwin and Tomiura (2020) analyze the trade effect of the pandemic for most hard-hit countries (China, Korea, Italy, Japan, US, and Germany) McKibbin and Fernando (2020) analyze the effects of COVID-19 on macroeconomic variables and financial markets using a CGE model for 20 countries including

Turkey. They found a significant impact of the outbreak in the short run under seven different scenarios. Zeren and Hızarcı (2020) examine the effects of the outbreak on financial markets of five countries (China, South Korea, Germany, Italy and Spain) using Makki co-integration test with a daily data. They found a cointegration between COVID-19 and SSE, KOSPI and IBEX35 markets, but no co-integration with FTSE, MIB, CAC40, DAX30. . Recent studies indicate that the risk level of all countries increased dramatically in March when COVID-19 spread to more than 200 destinations(Gormsen and Koijen,2020; Zhangetal.,2020) By late March,however,governments and central banks have adopted a wide range of economic policies(:Elgin et al.,2020;Nicola et al.,2020;Carlsson-Szlezak et al.,2020;among others)in order to slow down the impact of the lockdown and the sparking fear caused by the pandemic. In the US, famous companiessuch as Sears, J.C Penney, Neiman Marcus, Hertz, and J. Crew underenormousfinancial pressure. The travel industry is deeply affected;80% of hotel rooms are empty (Asmelash & Cooper, 2020),

3. DATA AND METHODOLOGY

The study was carries out with daily data of Covid 19 numbers and EUR/USD, gold , brent oil and wheat prices between the periods December 31,2019 to September 04 ,2020 that consist 180 data. Natural logarithms of all series were used in the analysis. These data are obtained from www.investing.com, www.nasdaq.com/market-activity/commodities/zw/historical, and ourworldindata.org/coronavirus-data . In this study, the stationary of the series were analyzed with ADF (Augmented Dickey Fuller) unit root tests. Interactions between the series were analyzed by the ARDL Bounds Test, Impulse-Response Function and Variance Decomposition methods based on the VAR (Vector Aotoregressive) method. The fact that the series used in the analysis are not stationary leads to misleading results. For this reason, the stationarity of the series should be examined first and the predictions should be made on the series that are stationary.Unit Root Tests is basically checking whether the series is stationary or not. The hypotheses for unit root tests areas:

H_0: Series are not stationary.

H_1: Series are stationary.

The unit root test is a common procedure to determine whether a financial variable follows a random walk. If the existence of a unit root for a series cannot be rejected, then the series is said to follow a random walk.In 1981, Dickey and Fuller developed this test and reorganized it as an ADF test. In the study, the stationary level of the series was tested with ADF Test. Table 1 indicates the outputs of ADF unit root tests.

Table 1: Unit Root Test Results

Variable	ADF Test Statistics	Mac-Kinnon Critical Values			Level	Probability
		1%	5%	10%		
Covid19	-5,449,695	-3,469,451	-2,878,618	-2,575,954	1st Dif.	0,0000
Eurusd	-1,368,147	-3,467,205	-2,877,636	-2,575,430	Level	0,0000
Gold	-1,404,901	-3,467,205	-2,877,636	-2,575,430	Level	0,0000
Oil	-1,071,903	-3,467,205	-2,877,636	-2,575,430	Level	0,0000
Wheat	-1,555,659	-3,467,205	-2,877,636	-2,575,430	Level	0,0000

The ability of variables to affect each other and to act is created by the vector autoregressive (VAR) model in econometrics. The basic assumption of the model is that there is no need to distinguish between internal and external variables. With the VAR model, the reliability of causality tests is increased and the problems other than the problems caused by the choice of variables are greatly reduced.There are many criteria used in the literature to determine the lag length criteria. Criteria that have been evaluated in this study are as follows: Akaike's information criterion (AIC), Schwarzinformation criterion (SIC), Hannan-Quinn criterion (HQC), Final prediction error (FPE). The methods specified according to the assumptions of the model created and the sample size can give different lag length criteria. The outputs for the lag length criteria figures out the length as one periods.

The ARDL test developed by Pesaran, Shin and Smith, which can be used in samples with limited number of observations and enables variables to be analyzed without the need for integration as in the Johansen-Juselius and Engle-Granger cointegration tests, is an effective method to predict short and long term relationships. With this method, a variable at the level of variables, at the first level or at the level of a variable can be included in the analysis as a constant at the first level. ARDL method can be performed without the need for any unit root test.ARDL approach can test the existence of cointegration relationship between series with different degrees of stationarity.If the calculated F statistic is greater than the upper limit, there is a cointegration.If the calculated F statistic is between the upper and the lower limit, it is considered indefinite so that there is no cointegration. If the calculated F statistic is less than the lower limit, there is no cointegration.

Impulse-response functions are obtained after the appropriate lag lengths are found in the VAR system. Impact-response functions reveal the effects of shocks on variables and at what time, with the help of tables or graphics. With this process, it is understood in which variable the shocks occur and how the variables react to these shocks. The columns express the variables in which shocks occur, while the rows show the responses of the variables to these shocks.(Tarı,2010). Looking at all charts, the effects of each on itself are more volatile than other data.Covid 19's effect on itself shows a decreasing slope.However, contrary to what is expected of covid 19, the impact response graph on

wheat is remarkable.Covid 19 has a negative effect on wheat for the first 2 months.The effect of shock is significant and as a statistically meaningful over 2 months for all variables.

Variance decomposition investigates what percentage of the change in a variable is caused by itself and what percentage is caused by other variables. If it explains a value close to one hundred percent of the change in variance, it is considered as an exogenous variable. It is very important to order the variables in this analysis. Sorting is done from external to internal. Variance decomposition is the second function targeted in VAR. In Covid 19, wheat appears to be the variable with the highest power to explain the change in time.While close to 92 % of the shock from Covid 19 was self-explanatory in the second period,10.during the period, 90% of the shock itself is explained by 0.5% of EUR/USD, 0.03% of Gold , 1.7% of Brent oil and 7,5% of Wheat. While close to 100% of the shock from EUR/USD was self-explanatory in the first period,10.during the period, 99% of the shock itself is explained by 0.5% of brent oil ,0.2% of wheat, 0.09% gold and 0.1% of Covid 19. While close to 100% of the shock from Gold was self-explanatory in the first period,10.during the period, 97.6 % of the shock itself is explained by 1.3% of brent oil ,0.01% of wheat, 0.69% eur/usd and 0.4% of Covid 19. While 95% of a shock coming to Oil is announced from the first period, 92.5% of the shock above Oil is explained by itself and 3,24% of Covid19 , 2.93% of it is from EUR/USD ,1.32% of Wheat and 0.003% of gold in the last period. Looking at the table of wheat variance decomposition, 98% of it was explained by itself in the first period, and as the period progressed, the ability to be explained by Covid 19 consistently increased.

4. CONCLUSION

Based on the findings from this study, it can be understood that there was no significant interaction between Covid 19 ,EUR/USDBitcoin, Gold, Brent Oil and Wheat. The series were examined by ADF and PP unit root tests and all series were observed to be .Since VAR analysis can be done using stationary series; The data set is modeled.After the lag lengths were determined as 1st degree, the ARDL test were performed.Interactions between the series were analyzed also by the Impulse-Response Function. Shocks have lost their effect on average in 2 months. Next Variance Decomposition method is based on the VAR (Vector Aotoregressive) method. Based on the findings from this study, it can be understood that there was no significant interaction between Covid-19 numbers and the closing prices of EUR/USD,Gold, Oil, Wheat.The result may be beneficial for only literatüre. The results may change when applied with other macroeconomic values.

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