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The nexus between tourism and international service trade in the coronavirus pandemic: Evidence from Turkey

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ABSTRACT

Coronavirus (COVID-19) pandemic has affected all economic processes as well as the tourism industry and service exports. COVID-19 pandemic affects negatively not only in the production and manufacturing industry, but also has caused important problems in the service and tourism sector. The paper aims to determine the effects of tourism revenues, international tourist arrivals and COVID-19 pandemic on service exports and the tourism industry. In line with the results, there is a long-term relationship among tourism revenues, international tourist arrivals, exchange rates, and service exports. According to FMOLS and DOLS results, an increase in the tourism revenues, international tourist arrivals and exchange rates ensure raising service exports of Turkey. However, it is determined that COVID-19 pandemic lead to decreasing service exports of Turkey. In addition, Granger causality analysis revealed that there is a unidirectional causality relationship from exchange rates to international tourist arrivals in Turkey. On the other hand, it is determined that there are bidirectional causality relationships between tourism revenues and service exports, international tourist arrivals and service exports, international tourist arrivals and tourism revenues. Results of the analysis indicate that service exports of Turkey follows a rising trend and it can be reduced the effects of COVID-19 pandemic when development of tourism infrastructure and quality raises.

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1. Introduction

Tourism can be defined as the spatial separation between home and distant place and travel between these two places in its simplest definition (Holden, 2006, p. 11). With a broader definition, tourism is the whole of the relationships that result from both the temporary stay and traveling of people for various reasons and their travels (Pearce, 1995, p. 20). Individuals decide on their destination and the types of services that they will benefit from in line with their own preferences and expectations. Thus, they shape the tourism supply in the regions over time. In accordance with all these definitions, tourism has become one of the basic research topics of social sciences today due to its substantial effects on both the economy and people's lives.

Tourism revenues are important for national income and they have a multiplier effect on the national economy. Therefore, this multiplier effect has a positive effect on the economy and supports many industries (Freitas, 2003, p. 45; Proenca & Soukiazis, 2005; Sengupta & Espana, 1994). In many countries, tourism constitutes an important part of economic growth and business. In addition, inflows of foreign currency to the countries through tourism enable to close the budget deficit of the countries and create a great advantage in solving the unemployment problem. On the other hand, the tourism industry ensures the interaction of different cultures. For this reason, cultural institutions and consumption habits of the countries also change via the effect of international tourism. These differences provide an increase in entrepreneurial activities in tourism and bring new investments in entrepreneurial activities that gain positive acceleration. In addition, the tourism industry affects the development of many sectors directly or indirectly (Kitson, Martin, & Tyler, 2004).

One of the main problems of developing countries is unemployment. Since the tourism industry, which is an important sector for the reduction of this problem, is low in cost, investments in this area can be higher than other industries. In addition, tourism does not only provide employment for countries, but also it is important to allow in terms of inflows of foreign currency to

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the countries. In order to reach the level of developed countries, international tourism demand in developing countries is constantly increasing and it shows rapid development. At the same time, the tourism industry gets great support in order to meet the economic resources, foreign currency requirements and the expectations of the constantly increasing population in these countries. For these reasons, tourism is regarded as an important industry that provides large employment and plays a crucial role in economic growth and development (Holden, 2006, p. 90).

International tourism is an important industry for countries due to its large employment opportunities and foreign currency earning effects. The tourism industry plays a vital role, especially for developing countries, due to its role in reducing the negative impact on the current account balance (Cihangir, Erkan, & Harbalıoglu, 2014, p. 48). Besides the contribution of international tourist arrival to the country's economy, it is also a substantial factor in the formation of regional developments. Inflows of foreign currency to the countries increase, the balance of payments and foreign trade deficit decrease, the foreign debts of the country diminishes and the level of demands for goods and services in other sectors increases with the development of the tourism industry in a region.

The service export volume, which was 1.7 trillion dollars in the early 2000s, has increased to 6.2 trillion dollars in 2019. International tourism revenues, which were around 485 billion dollars at the beginning of the 2000s, has reached 1.7 trillion dollars by 2018. On the other hand, it is seen that the International tourist arrivals of 533 million people at the beginning of the 2000, has reached 1.4 billion people today in the world (World Bank, 2021). As it can be seen, the international tourism and travel industry, which is one of the most important sub-items of service exports, has an important place in terms of both increasing the employment level and narrowing the foreign trade deficit. Therefore, considering the potential of future tourism dynamism, significant investments in the tourism sector reveals that countries will realize a considerable increase in income and service exports.

Considering the tourism industry in Turkey, it is observed that international tourism receipts have reached 37 billion dollars today whereas it was about 5 billion dollars in the early 2000s. In addition to this, it is seen that service exports were around 14.6 billion dollars in the early 2000s, while today it has reached 64.6 billion dollars. When the data on the tourism industry are analyzed, it is observed that international tourism revenues constitute one third of service exports in the 2000s, while it constitutes more than half in today. Accordingly, the importance of international tourism for Turkey has occurred more clearly. In addition, it is seen that the number of international tourists arriving was around 7 million in 2000, while it has reached 46 million today (TURKSTAT, 2021).

COVID-19 pandemic has significantly affected the international service trade and tourism industry today. It is observed that service and tourism sector activities realized through interaction between people are negatively affected. In this regard, it is essential to investigate the effects of the COVID-19 pandemic on the international service trade and tourism sector.

While COVID-19 pandemic caused the biggest economic crisis of the century on a global scale, tourism was one of the sectors most negatively affected by this process. All the data released regarding tourism clearly reveal the magnitude of the loss in the sector. Travel movements have been stopped gradually since December 2019, when the COVID-19 pandemic started. In the first place, almost all international flights were suspended with the spread of the COVID-19 pandemic together with the restrictions imposed on travel movements in countries affected by the pandemic (Qunhui, 2020). According to the evaluation made by the United Nations World Tourism Organization (UNWTO), the damage caused by COVID-19 to the tourism industry increased 8 times that of the global economic crisis in 2008.

The tourism sector is a sector that responds positively or negatively to the economic and social developments in terms of its structure. While attractive places in different destinations, natural and historical artifacts, cultural and religious elements become a center of attraction and source of income for tourism, factors such as terrorist attacks, political adversities, pandemics can lead to changes in travel plans or cancellation of reservations. Political troubles or terrorist attacks are mostly specific to regions or countries, whereas the effects of pandemics are seen in more than one region or country. The interest and confidence in the destinations where such negative developments are experienced can be seriously diminished.

As international travel is restricted, it is inevitable that the COVID-19 pandemic will affect all tourism activities at the international level. The contact of people with each other has been the greatest source of spread of the virus and it has dealt a big blow to travel activities. In this case, it is clear that companies in the tourism sector will be suffered the most from COVID-19 pandemic.

Along with the coronavirus pandemic, it is seen that these positive developments in the tourism industry have slowed down or even interrupted. The decrease in mobility at the international level has caused a significant decline in the revenues from the tourism industry. In this direction, it is important examining the effects of the coronavirus pandemic on service exports and the tourism industry, analyzing empirically and making policy recommendations in line with solutions.

Analyzing the effects of the pandemic on the service exports and tourism sector will make significant contributions to the literature, which examines the effects of the COVID-19 pandemic on the tourism industry that has an important place in the service sector. It is important to determine the long-term effects and causality relationships of COVID-19 cases and deaths on the service trade and tourism sector in order to reduce the negative effects of the pandemic and to evaluate the opportunities. It is thought that the findings obtained by the analysis will guide the measures to be taken and the policies to be implemented in the COVID-19 pandemic process. In this direction, the main focus of the study is to reveal the effects of the COVID-19 pandemic on service exports and the tourism industry and to make future policy recommendations.

In this study, it is aimed to determine the effects of tourism revenues, international tourist arrivals and COVID-19 pandemic on service exports and tourism industry. In order to establish the service exports and tourism industry model for Turkey, international tourism revenues, international tourist arrivals, exchange rates, COVID-19 in Turkey will be used as variables. In the following section, the effects of the variables defined in the research model on service exports and tourism are discussed within the scope of the literature. Then, the theoretical explanations regarding unit root test, cointegration test, causality test and long-term coefficient estimates for the variables are presented in the methodology section. The findings obtained as a result of analyzes are discussed in line with the literature in the empirical results section. Afterwards, the theoretical and empirical results obtained from the analyzes are comprehensively evaluated in the conclusion and discussion section.

2. Literature Review

International service trade has great importance for countries today. The service sector has a greater share in the sectoral distribution of both gross domestic product and employment. Along with the liberalization of international trade, it is seen that competition has increased and service trade has become increasingly important.

The service sector is a branch of industry that provides some changes to the beneficiary of the service or for his benefit and creates benefits such as time and space. Services are produced by the service provider's providing benefits for the service user, the service client's showing the necessary effort to produce the service, and the service client and the producer being in mutual interaction (Aslan, 1998, p. 9). Conjunction with the twentieth century, it is seen that the service sector surpassed other industries and it made significant contributions to economic development. In addition, it is observed that the service sector is more developed in countries with high welfare levels. Accordingly, it has emerged that the service sector is extremely important for increasing the welfare level in developing countries.

Tourism has an important place in the service sector. International tourism plays an important role in providing foreign currency inflow to the country, financing economic growth and solving macroeconomic problems such as unemployment. However, the tourism sector also provides the interaction of people though different cultures. These positive effects ensure the increase of entrepreneurial activities in the tourism sector and the realization of new investments in tourism (Belk & Costa, 1995). However, there are significant contractions in the tourism sector as in every field because of the profound effects of the current COVID-19 pandemic. In this direction, it has been observed that there is a need for studies in the academic literature investigating the effects of the COVID-19 pandemic and tourism on international service exports. It is aimed to make significant contributions to the literature by empirically investigating the effects of the COVID-19 pandemic and tourism on international service exports via this study.

Service trade is important within the scope of international trade of countries. Especially by the globalization process, the country's economies have

become open to international competition, and then the service sector has also developed significantly. Tourism has an important place in the development of both the international trade and service sector (Ekinci, 2005). It is expected that tourism activities between countries increase in consequence of the increase in commercial relations among the countries in tourism as a service sector. In academic studies, it is revealed that there is a positive relationship between international trade activities and the tourism sector among the countries (Bahar & Baldemir, 2008; Chang, 2011; Vu & Turner, 2009).

Exchange rate is one of the important factors affecting the international service trade and tourism sector. As in the international commodity trade of countries, international service trade is also affected by exchange rate volatility. It is expected that there is an increase in international service trade when the exchange rate rises and the local country currency depreciates. This increases the trade volume of the service sector in which tourism is involved. Studies in the literature show that there are significant effects between exchange rate and international service trade (Baggs, Beaulieu, & Fung, 2010; Sahoo, 2018).

The COVID-19, which emerged in Wuhan, China in 2020, became a pandemic soon and had significant effects on the international economy (Feyisa, 2020; Ruiz Estrada, Park, & Lee, 2020). With the COVID-19 pandemic, some problems have emerged in the global supply chain and international trade network, and a global supply and demand shock has been experienced. Accordingly, global political, economic and social uncertainties and risks may negatively affect the service sector, including tourism (Polat, Alptürk, & Gürsoy, 2021; Akdağ & İskenderoğlu, 2021). The service sector facilitates the spread of the virus in the global pandemic due to the interaction between individuals during the service activities process. Therefore, services trade is directly affected by the constraints in the pandemic. It is seen that COVID-19 pandemic is greatly adversely affecting international services trade, especially the tourism sector (Hu, 2020; Kabadayi, O'Connor, & Tuzovic, 2020; Kumudumali, 2020; Ozili & Arun, 2020; Priyanto, Purnomo, Andoko, Khairina, & Fadhlurrohman, 2020; Shretta, 2020; Xin, 2021). Many tourism-related sectors have adversely affected because of the uncertainty caused by the COVID-19 pandemic, the cancellation of tourism reservations, and the prohibitions imposed by countries on international flights. Due to the coronavirus pandemic, countries that host the most tourists were negatively affected economically such as France, Spain, United States of America, China and Italy. There are important losses with the global pandemic in the income of the tourism sector and service trade, which are of great importance economically for developing countries (Sarıkaya & Çeviş, 2020). Turkey was affected negatively by the COVID-19 pandemic in terms of the income of tourism and service trade like other developing countries. Accordingly, it is crucial to investigate the effects of the COVID-19 pandemic on service trade and to offer solutions for the problems.

Considering the significant effects of COVID-19 pandemic on the service trade and tourism sector, it is important to investigate the solutions of problems in the service trade and tourism sector in Turkey. This study aims to determine the effects of tourism revenues, international tourist arrivals and COVID-19 pandemic on service exports and the tourism industry and to contribute empirically to the literature.

3. Methodology

The aim of this paper is to determine the effects of tourism revenues, international tourist arrivals and COVID-19 pandemic on service exports and the tourism industry. In order to create the research model in the study, data on service exports, tourism revenues, international tourist arrivals, exchange rate, COVID-19 dummy variable in Turkey are used.

Data on service trade and exchange rates are obtained from the database of the Central Bank of the Republic of Turkey Electronic Data Delivery System. In addition, data of tourism revenues and international tourist arrivals are gained from the Turkish Statistical Institute. Series used in the study are monthly between 2016 and 2020. The information about the variables used in the study is as follows:

$ln(service)$: Service exports of Turkey

$ln(revenue)$: Tourism revenues of Turkey

$ln(arrivals)$: International tourist arrivals to Turkey

$ln(exchange)$: Exchange rates of Turkey

$covid19$: Dummy variable of COVID-19

Table 1: Descriptive Statistics

	$ln(service)$	$ln(revenue)$	$ln(arrivals)$	$ln(exchange)$
Mean	4.27E+09	2.15E+09	3133815	4.793
Median	3.96E+09	1.81E+09	2679420	4.637
Maximum	7.78E+09	5.24E+09	8167150	8.018
Minimum	1.27E+09	5.61E+08	24238	2.839
Std. Deviation	1.49E+09	1.11E+09	1806529	1.489
Skewness	0.363	0.876	0.762	0.358
Kurtosis	2.711	2.975	3.113	1.945
Jarque-Berra	1.502	7.541	5.738	3.996
Probability	0.472	0.023	0.057	0.136
Observations	60	60	60	60

Source: *Author*

Depending on this information, the times series models have been created for Turkey to determine the effects of tourism revenues, international tourist arrivals and COVID-19 pandemic on service exports (1):

$$ln(service)_t = \beta_0 + \beta_1 ln(revenue)_t + \beta_2 ln(arrivals)_t + \beta_3 ln(exchange)_t + \beta_4 (covid19)_t + \varepsilon \quad (1)$$

Before analyzing the relationship between tourism and service exports for Turkey during the pandemic period, descriptive statistics for the variables within the scope of the paper were examined and the findings are shown in Table 1, Table 2 and Figure 1. According to the findings in the Table 1, the average service export value in Turkey is 4.2 Billion $, tourism income is 2.1 Billion $, the average number of international tourist arrivals are 3 million people and the exchange rate is 4.8 $ based on monthly data in the period of 2016-2020. The high standard deviation of the variables indicates that the volatility of these variables is high. The degree of volatility can also be seen by considering the maximum and minimum values.

Table 2: Correlation Matrix

	$ln(service)$	$ln(revenue)$	$ln(arrivals)$	$ln(exchange)$
$ln(service)$	1	0.944	0.954	-0.052
$ln(revenue)$	0.944	1	0.989	0.018
$ln(arrivals)$	0.954	0.989	1	0.002
$ln(exchange)$	-0.052	0.018	0.002	1

Source: *Author*

Table 2 shows the correlation relationships between the variables. According to the results of the analysis, there is a positive and high correlation between service exports and tourism revenues and the number of international tourist arrivals, while there is a negative and low correlation between service exports and exchange rate. In addition, it is also seen that exchange rate has positive and low correlation relationships between tourism revenues and international tourist arrivals.

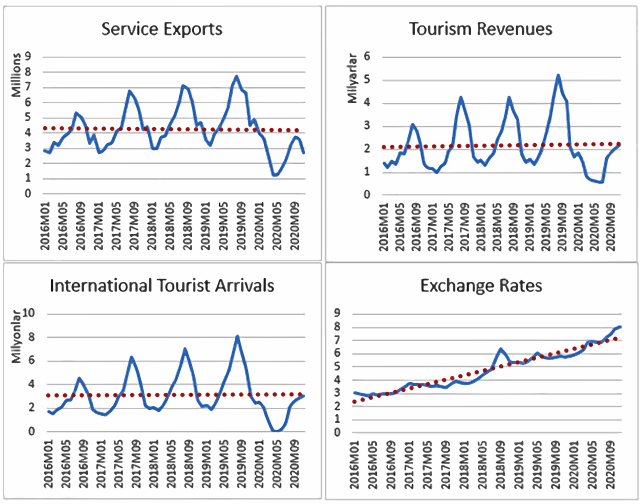

Figure 1: Trends of Variables Between 2016 and 2020
Source: *Author*

Trends of variables in the model are given in Figure 1. When the trends regarding the variables are analyzed, it is observed that service exports, tourism revenues and international tourist arrivals follow a trend that maintains its level despite the uncertainties and risks in the COVID-19 pandemic. Furthermore, it is seen that the exchange rate has an increasing trend and this trend continues with the COVID-19 pandemic.

After the descriptive statistics, the stationarities of the variables were analyzed by means of Augmented Dickey-Fuller (ADF) unit root test, Phillips-Perron (PP) unit root test and Zivot and Andrews unit root test with a structural break. Then, the long-term relationships between variables were examined using the Gregory-Hansen cointegration test with structural break. Later, causality relationships between variables were investigated via the Granger causality test.

Finally, long-term coefficient estimates of variables were made by way of FMOLS and DOLS.

In order to examine the relationships between variables, they should not contain unit root in the levels or first differences of the variables. The stationarity of the series was tested by Augmented Dickey Fuller (ADF) unit root test (Dickey & Fuller, 1979, 1981), Phillips & Perron (PP) unit root test (Phillips & Perron, 1988), Zivot and Andrews (1992) unit root test with a structural break. Augmented Dickey Fuller (ADF) (2) unit root test, Phillips and Perron (PP) (3) unit root test, Zivot and Andrews (Z&A) unit root test with a structural break in model A and model C (4, 5) are performed in accordance with the models shown below:

$$\Delta y_t = \alpha + \theta y_{t-1} + y_1 \Delta y_{t-1} + \varepsilon_t \quad (2)$$

$$\Delta y_t = \alpha y_{t-1} + x_t' \delta + \varepsilon_t \quad (3)$$

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \theta DU_t + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-i} + \varepsilon_t \quad (4)$$

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \theta DU_t + \gamma DT_t + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-i} + \varepsilon_t \quad (5)$$

It is known that one of the reasons for non-stationary variables is the structural breaks in the economy in the time series analysis performed. It is thought that structural breaks that develop in the economy may distort the averages, trends, or both averages and trends of the series. In other words, unit root tests that do not take into account structural breaks can give results that the series are stationary even if they do not contain unit root. It is stated that the results of traditional unit root tests that take structural breaks do not take into account may be deviated and wrong results may be reached in the analysis of structural breaks and economic shocks in an economy. Therefore, the Zivot and Andrews (1992) unit root test, which takes into account the structural break internally, was used in the study. In the analysis, model A tests only a break in the constant and model C tests a break in both a constant and trend.

The application of tests considering the structural breaks provides results that are more valid in order to analyze the long-term relationships of the series when analyzing the long-term relationships between the variables in the model. Gregory-Hansen (1996) cointegration test is a developed version of Engle and Granger (1987) approach and it shows more valid results than this test. The most important reason for this is that the structural break dates are determined endogenously in the Gregory-Hansen cointegration test. In the cointegration test developed by Gregory-Hansen, there have been put forward three models that consider structural break. The first model takes into account the structural break at the level (6) and the second model considers the structural break with the trend (7) (Gregory & Hansen, 1996, p. 103). α_1, α_2, α_3 and α_4 indicate the cointegration slope coefficients before the regime shift.

$$y_t = \mu_1 + \mu_2 \varphi_t + \alpha_1 x_t + \alpha_2 z_t + \alpha_3 e_t + \alpha_4 s_t + \varepsilon_t \quad (6)$$

$$y_t = \mu_1 + \mu_2 \varphi_t + \beta_t + \alpha_1 x_t + \alpha_2 z_t + \alpha_3 e_t + \alpha_4 s_t + \varepsilon_t \quad (7)$$

After proving that there is a long-term relationship between the variables in the research model, there will be tested the causality relationships between the variables. Engle and Granger (1987) argue that there is a unidirectional causality relationship between variables at least, in the case that long-term relationships are determined between variables. Granger causality analysis is performed by means of the following equations (8, 9, 10, 11):

Long-term coefficients of variables were tested using the "Fully Modified Least Squares Method (FMOLS)" developed by Phillips and Hansen

$$\Delta \ln(service)_t = \beta_1 + \sum_{i=1}^{l} \beta_{11} \Delta \ln(service)_{t-i} + \sum_{j=1}^{m} \beta_{22} \Delta \ln(revenue)_{t-j} + \sum_{k=1}^{n} \beta_{33} \Delta \ln(arrivals)_{t-k} + \sum_{r=1}^{o} \beta_{44} \Delta \ln(exchange)_{t-r} + \eta_1 ECT_{t-1} + u_{1i} \quad (8)$$

$$\Delta \ln(revenue)_t = \alpha_1 + \sum_{i=1}^{l} \alpha_{11} \Delta \ln(revenue)_{t-i} + \sum_{j=1}^{m} \alpha_{22} \Delta \ln(service)_{t-j} + \sum_{k=1}^{n} \alpha_{33} \Delta \ln(arrivals)_{t-k} + \sum_{r=1}^{o} \alpha_{44} \Delta \ln(exchange)_{t-r} + \eta_2 ECT_{t-1} + u_{2i} \quad (9)$$

$$\Delta \ln(arrivals)_t = \phi_1 + \sum_{i=1}^{l} \phi_{11} \Delta \ln(arrivals)_{t-i} + \sum_{j=1}^{m} \phi_{22} \Delta \ln(revenue)_{t-j} + \sum_{k=1}^{n} \phi_{33} \Delta \ln(service)_{t-k} + \sum_{r=1}^{o} \phi_{44} \Delta \ln(exchange)_{t-r} + \eta_3 ECT_{t-1} + u_{3i} \quad (10)$$

$$\Delta \ln(exchange)_t = \delta_1 + \sum_{i=1}^{l} \delta_{11} \Delta \ln(exchange)_{t-i} + \sum_{j=1}^{m} \delta_{22} \Delta \ln(arrivals)_{t-j} + \sum_{k=1}^{n} \delta_{33} \Delta \ln(revenue)_{t-k} + \sum_{r=1}^{o} \delta_{44} \Delta \ln(service)_{t-r} + \eta_4 ECT_{t-1} + u_{3i} \quad (11)$$

(1990) and the "Dynamic Ordinary Least Squares Method (DOLS)" introduced by Saikkonen (1992), Stock and Watson (1993) within the scope of the study. Equations used in FMOLS and DOLS estimation methods are as follows (12, 13):

$$Y_t = X'_t\beta + D'_{1t}\gamma_1 + u_{1t} \quad (12)$$

$$Y_t = X'_t\beta + D'_{1t}\gamma_1 + \sum_{j=-q}^{r} \Delta X'_{t+j^\delta} + v_{1t} \quad (13)$$

4. Empirical Results

In line with the theoretical explanations presented in the methodology section, firstly, the unit root analysis of the variables are carried out. As mentioned earlier, Zivot and Andrews (1992) unit root test with one structural break were performed together with Augmented Dickey Fuller (ADF) and Phillips & Perron (PP) unit root analyzes.

Table 3: Augmented Dickey Fuller (ADF) and Phillips & Perron (PP) Unit Root Test Results

Test	Variables	Augmented Dickey Fuller (ADF)		Phillips & Perron (PP)	
		I	I +T	I	I +T
Level	ln(service)	-0.485	-0.071	-1.379	-1.289
	ln(revenue)	-1.161	-0.289	-1.904	-1.124
	ln(arrivals)	-1.656	-1.546	-2.041	-3.103
	ln(exchange)	-0.156	-3.121	-0.435	-2.865
First Difference	ln(service)	-4.514***	-4.896***	-9.661***	-12.682***
	ln(revenue)	-4.972***	-5.312***	-15.152***	-17.467***
	ln(arrivals)	-4.649***	-4.669***	-15.997***	-14.199***
	ln(exchange)	-6.123***	-6.083***	-4.776***	-6.166***

*Note: "I" stands for constant term, "I + T" represents constant and trend. ***, **, and * indicate significance at 1 %, 5 % and 10 % respectively.*
Source: *Author*

In line with the results in Table 3, it is determined that service exports, tourism revenues, international tourist arrivals and exchange rates are not stationary in their levels. In other words, they have a unit root in level. However, it is seen that all variables are stationary in the first differences of the series.

Table 4 contains the results of the Zivot and Andrews (1992) unit root test, which tests the stationarity of the variables in the model with a structural break. According to the test results, it is revealed that service exports, tourism revenues, international tourist arrivals and exchange rates have a unit root, in other words, they are not stationary at their level with a structural break. However, it is determined that series are stationary at the first difference level.

Considering the structural break dates in the series, it is observed that structural breaks have occurred in service exports, tourism revenues and international tourist arrivals in February, March and May in 2020. These results show that service trade and tourism are affected by recession in both national and global economies because of COVID-19 pandemic. Due to the restrictions of the COVID-19 that emerged in early 2020, service exports are adversely affected, especially tourism.

Table 5: Gregory-Hansen Cointegration Test Results

Model	Break Date	ADF Statistics	%1 Critical Value	%5 Critical Value
C	2020M02	-6.32***	-5.77	-5.28
C/T	2020M02	-6.32***	-6.05	-5.57
R	2019M04	-7.43***	-6.51	-6.00
R/T	2019M03	-7.48***	-6.89	-6.32

*Note: ***, **, and * indicate significance at 1 %, 5 % and 10 % respectively.*
Source: *Author*

In line with the results of the Gregory-Hansen cointegration test, it is seen in the research model that there is a structural break in February 2020, when the first signs of COVID-19 were detected. In the research model, the null hypothesis that there is no cointegration relationship between the variables is rejected because absolute values of

Table 4: Zivot and Andrews (1992) Unit Root Test Results

Variables	Z&A (Level)			Z&A (First Difference)			
	Break Date	k	Statistic	Break Date	k	Statistic	Model
$ln(service)$	2020M02	10	-2.425	2020M03	10	-10.439***	A
	2020M03	0	-3.582	2020M03	10	-16.901***	C
$ln(revenue)$	2020M02	9	-2.535	2020M02	10	-7.384***	A
	2016M11	3	-4.365	2020M02	10	-7.895***	C
$ln(arrivals)$	2020M05	2	0.829	2020M04	9	-8.038***	A
	2019M07	1	-4.051	2020M03	10	-29.832***	C
$ln(exchange)$	2018M03	2	-1.939	2018M08	1	-8.309***	A
	2018M07	3	-4.476	2018M08	1	-8.719***	C
Critical Values	Model A => %10 : -4.194 ; %5 : -4.444 ; %1 : -4.949 Model C => %10 : -4.894 ; %5 : -5.176 ; %1 : -5.719						

*Note: ***, **, and * indicate significance at 1 %, 5 % and 10 % respectively.*
Source: *Author*

ADF test statistics are higher than 1% and 5% critical value. In other words, it is demonstrated that there is a long-term relationship between service exports, tourism revenues, international tourist arrivals, exchange rates and COVID-19 pandemic. At the same time, it is seen that the structural break dates obtained as a result of the cointegration analysis coincide with the results of Zivot-Andrews unit root test.

Table 6: VEC Granger Causality Test Results

Causality Direction	Chi-Sq	Probability
$ln(revenue) \not\Rightarrow ln(service)$	57.328***	0.000
$ln(service) \not\Rightarrow ln(revenue)$	16.485**	0.021
$ln(arrivals) \not\Rightarrow ln(service)$	24.911***	0.001
$ln(service) \not\Rightarrow ln(arrivals)$	70.851***	0.000
$ln(exchange) \not\Rightarrow ln(service)$	11.743	0.109
$ln(service) \not\Rightarrow ln(exchange)$	4.346	0.739
$ln(arrivals) \not\Rightarrow ln(revenue)$	36.555***	0.000
$ln(revenue) \not\Rightarrow ln(arrivals)$	73.817***	0.000
$ln(exchange) \not\Rightarrow ln(revenue)$	3.058	0.879
$ln(revenue) \not\Rightarrow ln(exchange)$	3.922	0.789
$ln(exchange) \not\Rightarrow ln(arrivals)$	22.851***	0.002
$ln(arrivals) \not\Rightarrow ln(exchange)$	2.364	0.937

*Note: ***, **, and * indicate significance at 1 %, 5 % and 10 % respectively. Optimal lags are chosen "7" according to AIC, SIC and HQ.*
Source: *Author*

When the Granger causality test results are examined, it is determined that there are important causality relationships between the variables. According to the results of the analysis, it is determined that there are bidirectional causality relationships between tourism revenues and service exports, international tourist arrivals and service exports, international tourist arrivals and tourism revenues. In addition to this, it is revealed that there is a unidirectional causality relationship from exchange rates to international tourist arrivals.

Long-term coefficient estimates and the results of the analysis are shown in Table 7. According to the analysis, it is seen that the coefficients that reveal the effects of the tourism revenues, international tourist arrivals and exchange rates on the service exports are positive and statistically significant as a result of both estimation methods. On the other hand, it is revealed that the COVID-19 pandemic has negative effects on Turkish economy, as well as on service exports, including the tourism sector. The findings show that COVID-19 pandemic has negative impacts on service exports, and preventive policies should be produced in order to overcome this crisis in the tourism sector.

5. Results and Discussions

The COVID-19 pandemic has caused significant problems in manufacturing, international trade and the global supply chain. COVID-19 pandemic affects negatively not only in the production and manufacturing industry, but also has caused important problems in the service and tourism sector.

Tourism is a sector in which people are in close contact with each other and service users and providers come together during the service activities. Increasing restrictions and decreasing contact between people have negatively affected the tourism sector and tourism-based industries such as transportation and logistics during the pandemic process, as stated by Hu (2020) Kabadayi, O'Connor, and Tuzovic (2020), Kumudumali (2020), Ozili and Arun (2020), Priyanto, Purnomo, Andoko, Khairina, & Fadhlurrohman (2020), Shretta (2020) and Xin (2021). Because, the high level of contact and interaction of people causes the virus to be transmitted and makes it easier to spread during the service activities. The findings obtained as a result of the paper reveal that the COVID-19 pandemic has negatively affected international service exports. In this direction, important steps are taken to ensure continuity in the service sector such as safe tourism and accommodation certificates in the tourism sector. In addition, transportation activities are tried to be continued by reducing the transport capacities in the transportation sector. Accordingly, it is a vital necessity to ensure the continuation of activities in

Table 7: Long-Term Coefficient Estimation Results

Model => $ln(service)_t = \beta_0 + \beta_1 ln(revenue)_t + \beta_2 ln(arrivals)_t + \beta_3 ln(exchange)_t + \beta_4 (covid19)_t + \varepsilon$				
	FMOLS		DOLS	
Variables	Coefficient	T Statistics	Coefficient	T Statistics
$ln(revenue)$	0.421***	9.851	0.379***	6.414
$ln(arrivals)$	0.118***	5.339	0.142***	4.644
$ln(exchange)$	0.133**	2.407	0.155**	2.045
$(covid19)$	-0.211***	-4.232	-0.193***	-2.794
Constant	11.223***	16.495	11.722***	12.463

*Note: ***, **, and * indicate significance at 1 %, 5 % and 10 % respectively.*
Source: *Author*

the service sector, which has an important place in the financing of countries' foreign trade deficits.

Considering the global impacts of the COVID-19 pandemic, it is clear that the policy measures to be taken against the crisis should be on a global scale. In the solution of economic problems caused by the COVID-19 pandemic, the implementation of coordinated policies of countries is of great importance to reduce economic losses. Otherwise, there will be significant macroeconomic problems such as the shrinkage of international goods and services trade, negative effects on the tourism sector and unemployment as a result of the increasing effects of the coronavirus pandemic. Evaluating the results of the analysis, it is seen that the increase in tourism sector incomes and the realization of foreign exchange inflow to the country have a positive effect on international service trade similar to the findings of Ekinci (2005) and Belk and Costa (1995).

The COVID-19 pandemic has different meanings compared to the economic crises that have occurred in the past. Today, the level of globalization has reached the highest point, the interdependence of countries has increased, but important problems have arisen in the global supply and supply chain due to the coronavirus pandemic.

Although the scale of the coronavirus pandemic is still unpredictable, the number of people affected by the virus is uncertain yet. Since the measures to prevent the transmission and spread of the virus negatively affect the economy, it is currently not possible to predict how and for how long it will affect the global economy. It is estimated that the psychological effects will continue for a few years even after the coronavirus pandemic is over. People abandoned or changed many of their habits with the pandemic and the measures taken with it. Whether abandoned or changed habits will return to pre-pandemic will depend on the psychological impact of pandemic on people.

In line with the changing habits after the COVID-19 pandemic, it is expected that the service trade and tourism sector are deeply affected. Because, both sectors contain activities where interaction takes place among the people. Therefore, it is expected that there will be significant differences in people's preferences to get back together and attend tourism activities after the coronavirus pandemic. It is substantial to investigate these effects that may occur in the post-pandemic process in future academic studies and to take early measures for the problems that may arise in regards to overcome the negative effects in the pandemic process.

6. Conclusion

In this paper, the effects of tourism revenues, international tourist arrivals and COVID-19 pandemic on service exports and the tourism industry have been analyzed for Turkey. The paper also investigates the effect of macroeconomic indicators of Turkey in terms of service export performance. As long as Turkey has tourism potential, it is seen that they are going to have substantial service export volume. Therefore, the study contributes to theoretical and empirical literature of service trade and tourism industry because having tourism revenues and international tourist arrivals contains service export advantages. However, it is revealed that COVID-19 pandemic has negative effects on service exports.

Long-term relations among tourism revenues, international tourist arrivals, exchange rates and service exports of Turkey is tested via Gregory-Hansen cointegration method in the study. Gregory-Hansen cointegration method allows estimating long-term relationships among the variables. In addition to this, causality relationship among the variables by Granger causality methods in the study is examined. Moreover, long-term coefficient estimates of variables are estimated by way of FMOLS and DOLS methods. These empirical approaches give new perspectives to analyze relationships among tourism revenues, international tourist arrivals, exchange rates, COVID-19 pandemic and service exports.

First, Gregory-Hansen cointegration analysis is performed in order to determine the long-term relations between the variables. In line with the results, it has been determined that there is a long-term relationship among tourism revenues, international tourist arrivals, exchange rates, COVID-19 pandemic and service exports. According to FMOLS and DOLS results, an increase in the tourism revenues, international tourist arrivals and exchange rates ensure raising service exports of Turkey. However, it is determined that the COVID-19 pandemic lead to decreasing service exports of Turkey. Thus, it has been reached the conclusion that positive effects of tourism revenues and international tourist arrivals on the service export of Turkey will be higher if the tourism industry quality and right investments of Turkey are more enhanced.

According to the results of Granger causality analysis, it is determined that there are bidirectional causality relationship between tourism revenues and service exports, international tourist arrivals and service exports, international tourist arrivals and tourism revenues in Turkey. On the other hand, there is a unidirectional causality relationship from exchange rates to service exports. Results of the analysis performed in line with the research hypothesis indicates that service exports of Turkey will follow a rising trend if tourism revenue, international tourist arrivals and exchange rate rise. In this direction, it is important for further studies to analyze the relationship between international service trade and tourism of countries for the period of COVID-19 pandemic and the period after it, both in Turkey and in countries with high tourism potential.

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The nexus between tourism and international service trade in the coronavirus pandemic: Evidence from Turkey

Abstract

Coronavirus (COVID-19) pandemic has affected all economic processes as well as the tourism industry and service exports. COVID-19 pandemic affects negatively not only in the production and manufacturing industry, but also has caused important problems in the service and tourism sector. The paper aims to determine the effects of tourism revenues, international tourist arrivals and COVID-19 pandemic on service exports and the tourism industry. In line with the results, there is a long-term relationship among tourism revenues, international tourist arrivals, exchange rates, and service exports. According to FMOLS and DOLS results, an increase in the tourism revenues, international tourist arrivals and exchange rates ensure raising service exports of Turkey. However, it is determined that COVID-19 pandemic lead to decreasing service exports of Turkey. In addition, Granger causality analysis revealed that there is a unidirectional causality relationship from exchange rates to international tourist arrivals in Turkey. On the other hand, it is determined that there are bidirectional causality relationships between tourism revenues and service exports, international tourist arrivals and service exports, international tourist arrivals and tourism revenues. Results of the analysis indicate that service exports of Turkey follows a rising trend and it can be reduced the effects of COVID-19 pandemic when development of tourism infrastructure and quality raises.

Keywords: *Service Exports, Tourism Industry, COVID-19, Gregory-Hansen Cointegration Test, VEC Granger Causality Test*

Authors

Full Name	Author contribution roles	Contribution rate
Ayberk Şeker:	*Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Resources, Data Curation, Writing - Original Draft, Writing - Review & Editing, Visualization, Supervision, Project administration, Funding acquisition,*	*100%*

Author statement: *Author(s) declare(s) that All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.* ***Declaration of Conflicting Interests:*** *The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article*

This paper does not required ethics committee report

Justification: The methodology of this study does not require an ethics committee report.