THE EFFECT OF FLUCTUATIONS IN EXCHANGE RATE AND CURRENT ACCOUNT DEFICIT ON TOURISM INCOME: EVIDENCE FROM TÜRKİYE[*]

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Abstract

In this study, the change in tourism income as a result of the stability outlook created by the changes in the current account deficit and exchange rate in Türkiye with the data between 2003:01 and 2021:06 is examined. The study has been examined with two different models due to the developments in the world and in Türkiye. As the first model structure, it was designed considering that there is no additional factor on Türkiye's economic and political structure. The second model, on the other hand, was created by taking into account the effects of the 2008 financial crisis and the Covid-19 (Coronavirus), which had the most impact on both Türkiye and the world economy and politics. Co-integration test and then Wald Granger causality test were applied. As a result of the research, it has been confirmed that there is a co-integration relationship between tourism income, current account deficit and exchange rate variables in both models.

Keywords: Tourism Income, Current Account Deficit, Exchange Rate, Maki Cointegration Test, Wald Granger Causality Test

Jel Code: Z30, F32, F31

1. Introductıon

The concept of tourism has made rapid progress since the 1950s and has become a large sector and has an indispensable place in the world economy. Tourism also has the feature of being a representative of peace and tranquility in the world by bringing cultures together. It is the tourism sector, which provides employment for countries, earns foreign exchange, provides foreign investment, and has a great impact on national income and balance of payments. (Bahar ve Kozak, 2018: 50).

As it is known, the tourism sector is subject to developments and events (natural disasters, epidemics, terrorism, economic crisis, etc.) and has a fragile structure that reacts faster than other sectors. The main reasons for the fragile nature of tourism are that its basis is "human" and tourism is not a compulsory need (Denk, 2019: 2; Gümüş ve Hacıevliyagil, 2020:76; Bahar ve İlal, 2020:126). However, despite the fact that many events have taken place in the world since the first years of global tourism activity, the sector has never lost its leading position. According to the data of the World Tourism Organization (WTO), the number of tourists, which was 25 million in 1950, increased to 700 million in 2002, 950 million in 2010, 1.2 billion in 2016, and reached 1.4 billion in 2019 (TÜRSAB and TUADER, 2017: 6). Worldwide, tourism income, which was 2.1 billion USD in 1950, reached 474 billion USD in 2002 and 1.5 trillion USD in 2019 (Yiğitgüden (11.12.2021), TÜRSAB 2020: 6).

Türkiye has kept up with the travel activities that have started to be experienced on a global scale. Many steps were taken between 1950 and 1980, and especially after 1980, intense efforts were made to revive Turkish tourism. With the enacted laws, incentive packages, and investments, it has been tried to ensure that Türkiye gets a bigger share of this pie. Although it is thought that the tourism sector will be negatively affected after most events (earthquakes, forest or other fires, coup attempt, etc.) in many

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countries, as in Türkiye, it is seen that the revival continues in the sector. The number of tourists coming to Türkiye at a record level in 2019 compared to previous years is one of the important examples of this situation (Çetin ve Göktepe 2020: 92). According to 2019 data, the Ministry of Culture and Tourism stated that approximately 52 million tourists were hosted, while 34.5 billion dollars of revenue was obtained in this period according to TURKSTAT data (TÜRSAB, 2020: 19).

The Covid-19 virus, which emerged in Wuhan, China in December 2019 and spread all over the world, has brought almost all international activities to a standstill by building a wall between the globalizing and more interconnected countries (Adıgüzel, 2020: 192). During the period when vaccine studies are expected to yield effective results, one of the most affected sectors has been the tourism sector. The Covid-19 virus has dealt a great blow to the tourism sector with millions of people in the world being unemployed, accommodation places being closed and transportation activities being stopped. In addition, it has dragged the countries that rely on the tourism sector and lose the biggest source of income to a great economic bottleneck. (TÜRSAB, 2020: 2). Throughout 2020, international trade and travel restrictions, as well as strict domestic measures, brought the tourism sector to an almost complete standstill. According to World Trade Organization (WTO), the world tourism sector decreased by 74% in 2020 and lost 1.3 trillion dollars in value (WTO, 2021). In 2021, although the tourism sector could not catch up with the vitality experienced in 2019, with the effect of the vaccines found, almost the same levels of touristic activity took place. According to WTO data, it was stated that the number of tourists in the world in the first 7 months of 2021 was 40% less than in 2019. According to the same data, it is stated that the number of visitors to Türkiye decreased by 33% (WTO, 2021). While the impact of Covid-19 has not passed and the danger of new variants continues to roam the world, countries are trying various ways to recover their economies. In particular, the continuous increase in the prices of manufactured goods and commodities puts economies in difficult situations. Especially in this period, intense efforts were made to revive the international goods and services sector, whose value was understood even more in these days.

The tourism sector provides low investment and high foreign currency inflows for developing or developed countries, and also has an important role for countries in reducing the current account deficit or giving the current account surplus (Cinel and Yolcu, 2021: 248). Apart from this, when the relationship between tourism and the exchange rate is taken into account, although there are some studies that support that they are directly proportional to each other, there are also some studies that observe the opposite. The fact that rise in the exchange rate increased the number of tourists, but instead of having a positive effect on foreign exchange income, it led to a decline between 2014 and 2018 in Türkiye. According to the CBRT, while the annual average buying and selling price of the US dollar was 2.19 TL in 2014, this value more than doubled and reached 4.81 TL per year in 2018. In addition, according to TURKSTAT, while the number of tourists was 36 million 837 thousand 900 people in 2014, this number was 39 million 488 thousand 401 people in 2018. However, despite the increase in the exchange rate and the number of tourists, tourism revenues fell from USD 34.4 billion in 2014 to USD 29.6 billion in 2018. In fact, in 2019, even though Turkey broke a record in the number of visitors with 45 billion visitors and the US dollar buying and selling exchange rate rose to an annual average of 5.67 TL, tourism revenue was USD 34.5 billion in

this period, almost the same as in 2014. It is seen that the biggest reason for this situation is package tours. Despite lower package tour prices and consequently an increase in the number of tourists, tourism income does not increase regardless of the increase in tourists (Akar and Özcan, 2021: 427; Karadağ and Bağcı, 2020: 454-455).

This study examines the changes in the exchange rate, current account deficit, and, tourism revenues, which are important problems in developing countries. It is aimed to examine the effect of the changes in the exchange rate and the current account deficit on tourism revenues, the importance of which has been emphasized more recently in Türkiye. An attempt was made to find an answer to the following question; "Does the change in the exchange rate and current account deficit in Türkiye have any effect on Türkiye's tourism income?" To answer this research question; the long-run relationship between the above variables was examined with recent data. It is found that there are very few studies in the literature where these three variables are examined together. It will be tried to contribute to future studies and to meet the needs in the field with this research.

2. Literature

During the literature review, very few studies have been found in which the real exchange rate, current account deficit, and tourism income data are all examined together. However, when the studies with different variables and models are examined, it is seen that the dependent variable is mostly tourism income and the independent variables vary. Care was taken to include studies based on these three variables. Table'1 contains a summary of the empirical literature from selected studies.

Table 1: Empirical Literature

WRITER-YEAR	COUNTRY and PERIOD	VARIABLES	METHOD	RESULT
Şen ve Şit – 2015	Türkiye 2000:01-2012:12	Tourism Income - Real Exchange Rate	Toda-Yamamoto	There is a bidirectional relationship between the real exchange rate and tourism income.
Baratı ve Ranjbar – 2016	Persia 1995:01-2011 :12	Real Tourism Income - Real Exchange Rate	Granger	There is a positive relationship between Tourism Income, Real National Income, and Real Exchange Rate.

Sharif ve Afshan – 2016	France 1996:01-2015:08	Tourism Income - Exchange Rate	Dalgacık Tabanlı Granger, ARDL, Johansen-Juselius	Tourism and exchange rate have a one-way causal relationship in the short run and a two-way causality relationship in the medium and long run.
Şit- 2016	Türkiye 1980:01-2015:12	Current Account Deficit - Net Tourism Income	VECM, Granger	There is a negative relationship between the Current Account Deficit and Net Tourism Income.
Lamsso ve Masoomzadeh - 2017	Persia 1995:01-2013:12	Exchange Rate - Balance of Payments - Number of Tourists	Vector Error, J-Curve	The increase in the exchange rate has a negative effect on the current account balance in the short term and a positive effect on the tourism income in the long term. It varies by country.
Muzindutsi ve Manaliyo – 2018	South Africa 2007:01-2015:12	Real Exchange Rate - Tourism Income	VAR, Johansen	The real exchange rate affects Tourism Revenue in both the long and short run
Saçık, Akar ve Gülmez- 2019	Türkiye 2003:01-2018:04	Tourism Income - Current Account Deficit 2003-2018	VAR, Granger	There is a bidirectional causality relationship
Sancar ve Akbaş- 2019	Türkiye 2013: Q1-2017: Q4	Tourism Income - Current Account Deficit	SVAR	Tourism Revenues have a great impact on the Current Account Deficit.
Sharma, Vashishat ve Rishad – 2019	India 2003: Q1-2017: Q4	Exchange Rate - Tourism Income	ARDL	The relationship between the exchange rate and tourism income is negative.

Uslu-2019	Türkiye 2003:01-2018:09	Tourism Revenues - Current account deficit	ARDL	Tourism income, exchange rate, and current account deficit are affected by each other and act together.
Irandoust -2019	Sweden 1995:01-2016:12	Real Exchange Rate - Tourism Income	VAR	There is an asymmetrical relationship between the fluctuations in the exchange rate and the income from tourism.
Gil-Alanaa, Figueiredo ve Wanke – 2019	Brazil 1995:12-2016:09	Exchange Rate - Tourism Income	ARMA-class	There is a positive relationship between the changes in the exchange rate and the tourism that occurs as a result of mega sports events.
Bozkurt, Armutçuoğlu ve Ergün- 2020	Türkiye 1995:01-2017:12	Real Exchange Rate - Tourism Income	DCCE	Shocks in both exchange rate and tourism demand are temporary.
Alleyne, Okey ve Winston Moore-2021	China 2004:01-2017:12	Exchange Rate - Tourism Income	ARCH, GARCH, Threshold GARCH	Exchange rate fluctuations affect Tourism income, but they are not the only factor.
Arslan ve Çetiner-2021	Türkiye 2008:01-2019:06	Exchange Rate - Tourism Income	Johansen, Granger, VAR	There is a positive and significant relationship between the exchange rate and tourism revenues. However, their level of influence on each other is low.
Akar ve Özcan - 2021	Türkiye 2012:01-2019:12	Exchange Rate - Tourism Income	SVAR	There is no significant effect between Exchange Rate and Tourism Revenues.

Timur ve Mert - 2021	Türkiye 2003: Q1-2020: Q1	Real Exchange Rate - Tourism Income	NARDL	An increase in exchange rate increases Tourism income
Akboz ve Canatan- 2021	Türkiye 2012:01-2019:12	Exchange Rate - Tourism Income	ARDL	There is no co-integration relationship
Cinel ve Yolcu- 2021	Türkiye 2013:01-2019:12	Tourism Revenues - Current Account Balance Data	Artificial Neural Networks	Tourism revenues have a great impact on the current account deficit.

3. Data And Methodology

The variables in this study are from Turkey and are monthly for the period 2003:01-2021:06. The current account deficit (Million USD), the real exchange rate (USD/TL cpi-based real effective exchange rate (2003=100)) and tourism revenues (Million USD) are considered. The relationship between these three variables and the short and long-run effects of changes in the exchange rate and the current account deficit on the tourism sector are analyzed using unit root and causality tests.

In order to determine the relationship between Current Account Deficit (CURRENT), Real Exchange Rate (EXCHANGE), and Tourism Income (TOURISM), the data were taken from the Central Bank of the Republic of Türkiye (CBRT) Electronic Data Distribution System (EVDS). In the study, Tourism Revenue (Million Dollars) is calculated by excluding mobile phone roaming and marina service fees, the Real Effective US Dollar/Turkish Lira Exchange Rate (CPI-based (2003=100)) is used to represent the Exchange Rate and the Current Account Deficit is taken as Million Dollars. The period 2003:1, when tourism data obtained from the CBRT-EVDS started to be published on a regular monthly basis, was chosen as the starting point of the study. Moreover, Tramo/Seat technique was used to adjust the Tourism Income data from seasonal effects.

Figure 1:Graphical Analysis of Current Account Deficit Data (Million USD)
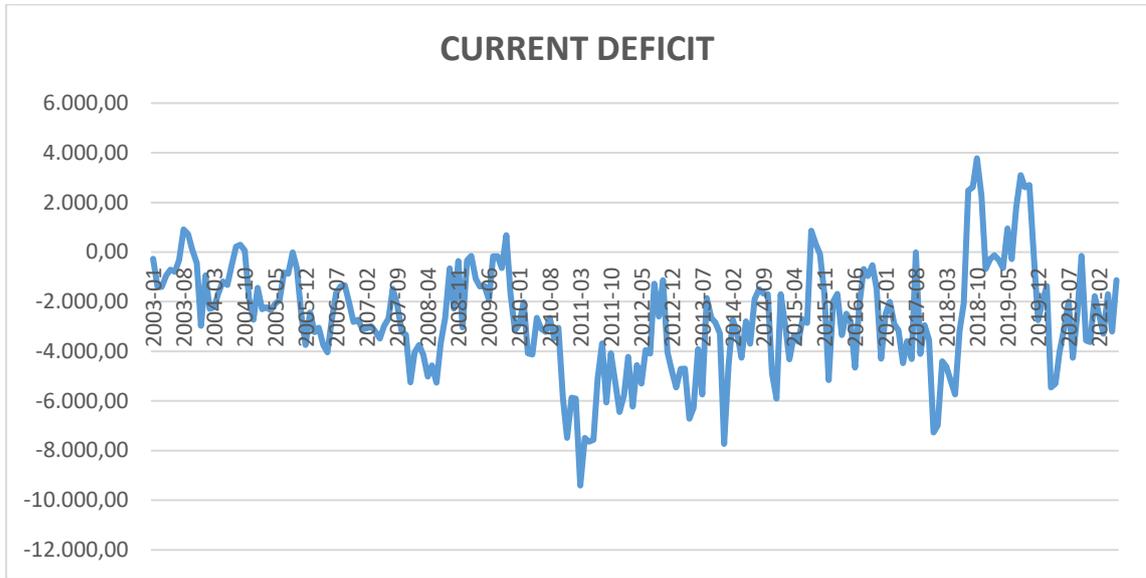
Figure 2: Graphical Analysis of Exchange Rate Data (USD)
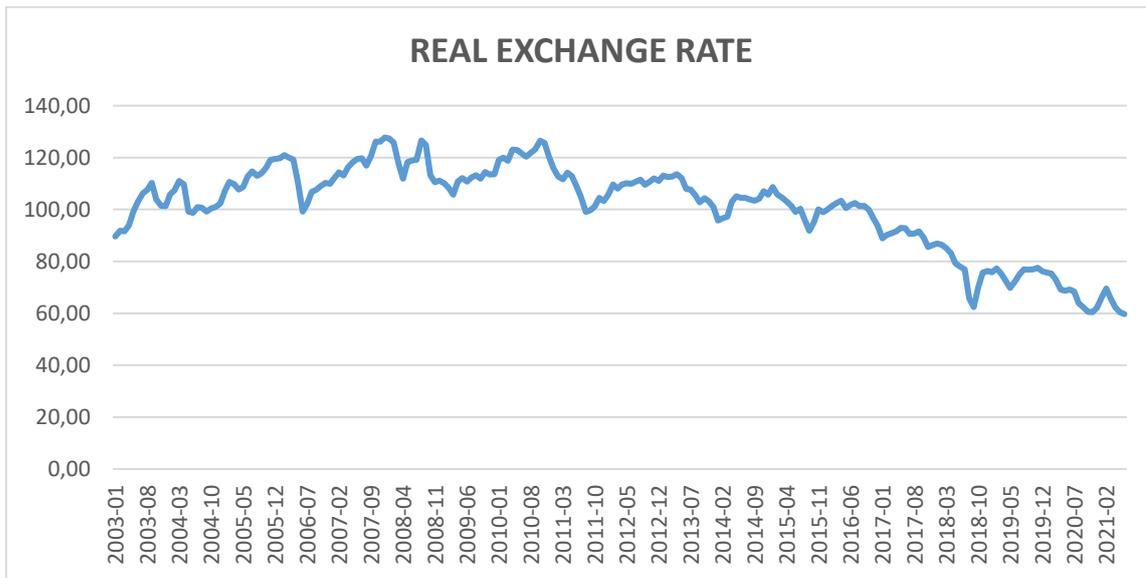
Figure 3: Graphical Analysis of Tourism Revenue Data (Million USD)

In order to evaluate the data in the study and to determine the relationship, Lee-Strazicich (2003) Minimum Lagrange Multiplier (LM) Double Structural Break Unit Root Test for stationarity in the series, the Maki (2012) Co-integration Test to determine the long-term equilibrium relationship, and, the causality relationship was examined by the Wald Granger Causality Test.

While establishing the models of the study, it is aimed to calculate the effect of fluctuations in the Current Account Deficit and Exchange Rate on Türkiye's tourism income. However, when the developments in the world and in Türkiye are taken into account, the need to work on two different models has been felt. As the first model structure, it has been designed considering that there is no additional factor on Türkiye's economic and political structure. The second model was created by taking into account the effects of the 2008 crisis and the Covid-19 (Corona) virus, which had the most impact on both Türkiye and the world economy and politics. For this reason, the periods when data loss is high and vulnerability is felt most are added to the second model design as a dummy variable. Considering the subject as two different models is of great importance in terms of the accuracy of the result of the study and its contribution to the literature. The established models are given below;

Model 1;

$$TUR\dot{I}ZM_t = \alpha_1 + \alpha_2 CAR\dot{I}_t + \alpha_3 D\ddot{O}V\dot{I}Z_t + \mu_t \qquad (1)$$

Model 2 (with dummy variable);

$$(2)$$

$$TUR\dot{I}ZM_t = \alpha_1 + \alpha_2 CAR\dot{I}_t + \alpha_3 D\ddot{O}V\dot{I}Z_t + \alpha_4 K_{2008,2020,2021} + \mu_t$$

4. Method

4.1. Lee-Strazich (LM) Unit Root Test with Double Structural Break

In unit root tests, Peron (1989) drew attention to structural break and stated that a unit root test in which structural break was not taken into account did not give accurate results. The most important feature that distinguishes the LM one or two break unit root test, which is one of the structural break unit root tests, is that it avoids the spurious rejection problem of the Zivot and Andrews (1992) and Perron (1989) tests, which allow extended Dickey-Fuller (ADF) type structural breaks (Lee and Strazicich, 2003: 1082; Tıraşoğlu, 2014: 74).

Lee-Strazicich (2003) structural break test is divided into three models A, B, and C. Model selection is of great importance in this test. While the A model, which is also described as the "collision" model, allows for level breakage, Model B, referred to as "Switching Growth", allows for a one-time change in level, that is, a break in the slope. The C model, which is the most valid model among the models, allows breaking both in level and slope. Lee-Strazicich used models A and C. In order to obtain a more meaningful result in the study, it was decided to use the C model of the Lee-Strazicich (2003) unit root test with two structural breaks (Lee and Strazicich, 2003:1082; Tıraşoğlu, 2014: 74-75).

Model A;

$$\Delta t_1 = \mu + \beta_1 + \alpha y_{t-1} + \phi DU1_t + \theta DU2_t + \sum_{i=1}^{k} d_i \Delta y_{t-1} + \varepsilon_i \qquad (3)$$

Model A dummy variables are expressed as follows;

$$DU_1 = \begin{cases} t > TB_1, & \cdots\rightarrow 1 \\ Other & \cdots\rightarrow 0 \end{cases} \qquad (4) \qquad\qquad DT_1 = \begin{cases} t > TB_1 & \cdots\rightarrow t - TB \\ Other & \cdots\rightarrow 0 \end{cases} \qquad (5)$$

Model C;

$$\Delta t_1 = \mu + \beta_1 + \alpha y_{t-1} + \phi_1 DU1_t + \phi_2 DU1_t + \theta_1 DU2_t + \theta_2 DU2_t + \sum_{i=1}^{k} d_i \Delta y_{t-1} + \varepsilon_i \qquad (6)$$

Model C dummy variables are;

$$DU_1 = \begin{cases} t > TB_2 & \cdots\rightarrow 1 \\ Other & \cdots\rightarrow 0 \end{cases} \qquad (7) \qquad\qquad DT_1 = \begin{cases} t > TB_2 & \cdots\rightarrow t - TB \\ Other & \cdots\rightarrow 0 \end{cases} \qquad (8)$$

From the values in the formulas, TB$_1$ represents the first break, and TB_2 the second break. The DU value represents a break only at the constant, and the DT value represents the break at both the constant and the trend. In the null hypothesis value, it is stated that the series is within the unit root without any change, and it is shown that the alternative hypothesis series is stationary with two structural changes (Tuna and Öztürk, 2016: 553).

4.2. Maki Multiple Structural Fracture Co-integration Test

Weterland and Edgerton (2006) stated that structural breaks in the series to be analyzed will create stubs in co-integration test results as well as in unit root tests. In order to eliminate this situation, George and Hansen (1996), Weterland and Edgerton (2006), Hatemi-j (2008), Carrion-i-Silvestre and Sanso (2006) tests and many other tests to be used for this purpose have been developed (Maki, 2012: 2011). The developed tests try to reach the result by considering a structural break. The co-integration test of Daiki Maki (2012) can test the co-integration relationship between series up to five structural breaks. In the Maki co-integration test, each period is handled separately due to the possibility of being a possible breakpoint. The t statistics are calculated and the points where t is the smallest are accepted as the breakpoints of the series. All series to be examined in the Maki (2012) co-integration test must be I(1) (Maki, 2012: 2011-2012; Göçer vd., 2013: 10; Beşel and Yardımcıoğlu,2014: 9).

Maki Co-integration test is based on 4 basic models (Maki,2012: 2011-2012);

Model 0; trendless model with break in constant term;

$$y_{t=}\mu + \sum_{i=1}^{k} \mu_1 K_{i,t} + \beta \chi_t + u_t \tag{9}$$

Model 1; trendless model with break in constant term and slope;

$$y_{t=}\mu + \sum_{i=1}^{k} \mu_1 K_{i,t} + \beta \chi_t + \sum_{i=1}^{k} \beta_i \chi_i K_{i,t} + u_t \tag{10}$$

Model 2; trend model with break in constant term and slope;

$$y_{t=}\mu + \sum_{i=1}^{k} \mu_1 K_{i,t} + yt + \beta \chi_t + \sum_{i=1}^{k} \beta_i \chi_i K_{i,t} + u_t \tag{11}$$

Model 3; pattern with break in constant term, slope and trend;

$$y_{t=}\mu + \sum_{i=1}^{k} \mu_1 K_{i,t} + yt + \sum_{i=1}^{k} y_i t K_{i,t} + \beta\chi_t + \sum_{i=1}^{k} \beta_i \chi_i K_{i,t} + u_t \qquad (12)$$

Hypotheses of the Maki Test;

H_0 = There is no co-integration under structural breaks.

H_1 = There is co-integration under structural breaks.

All the values required in the Monte Carlo simulation were calculated and included in Maki (2012). If the absolute value of the calculated value is greater than the critical value, it means that the H_0 hypothesis is rejected and there is a co-integration relationship between the series.

The most important feature that distinguishes the Maki (2012) test from others is that it gives meaningful results in studies conducted in developing countries such as Türkiye. The high incidence of sudden shocks in developing countries, political and economic instabilities, and the high number of statistical breaks associated with them make this test more useful in these countries compared to others (Beşel and Yardımcıoğlu, 2014: 10).

4.3. Granger Causality Analysis with Wald Statistics

Wald (chi-square) statistic is one of the methods used to test whether the regression coefficients are significant. "In classical regression analysis, it is the equivalent of the t test used in testing the coefficients in the model in this model". It is based on the assumption that the likelihood tests show an asymptotically normal distribution. Its purpose is to compare the most similarity estimate of the slope parameter β_1 with the standard error of this estimate. In short, Wald statistic is the ratio of the regression coefficients to the standard error (Hosmer and Lemeshow, 2000:16; Göktaş, 2020:14).

$$Z = \frac{\beta}{SE_\beta} \qquad (13)$$

The Wald statistic shows the "Standard Normal Distribution", comparing critical values and showing their significance.

$$W = Z^2 = \left(\frac{\beta}{SE_\beta}\right)^2 \qquad (14)$$

The Wald statistical value shows a chi-square distribution with a degree of freedom and the significance of a one degree of freedom chi-square distribution is determined after comparing it with the critical values.

Wald test hypotheses;

$$H_0 = \beta_1 = 0 \qquad\qquad (15)$$

$$H_1 = \beta_1 \neq 0 \qquad\qquad (16)$$

If the Wald Test Statistic result is greater than the value in the Z table, the null hypothesis is rejected, and if it is small, it is accepted.

The purpose of using causality tests is to determine the cause and effect relationship and direction between the variables. Especially in the last thirty years, the developments in the world have carried the causality tests to different dimensions and also revealed their importance. The Granger Causality Test, which was developed considering these reasons, reveals significant results in tests with more than two variables (Demirhan,2005: 76). Granger causality tests are one of the most used methods to determine the relationship between data, especially in the field of economics and financial markets. Granger (1969) stated that if the data in the first variable provides an improving effect on the estimation of the second variable, it can be said that the variables are the cause of each other. The purpose of the Granger test is to test the causality between two variables. However, in the study, Wald (chi-square) statistics were used to test the hypothesis of whether the coefficients related to the independent variables as a whole are different from zero. In short, if the Wald statistic is significant, it means that there is no Granger Causality among the variables and the null (zero) hypothesis is rejected (Enders, 2003: 282-284; Ciner,2011: 135).

5. Results And Comments

In order to determine the long-term relationships of the variables in the study, the stationarity levels of the data should be determined. In order to determine the stationarity level, Lee and Strazicich (2003) tests with two internal structural breaks, which allow breaks under both zero and alternative hypotheses, will be used. Lee and Strazicich (2003) rejecting the null hypothesis in the unit root test with structural break indicates that the series is stationary. Table-2 shows the results of the test;

Table 2: Lee and Strazicich (2003) Unit Root Test Results with Structural Break

Variables	Test Case	Breaking Point (λ)	Critical (Model C)	Values		Delay Lenght	Breaking Dates	Result
			%1	%5	%10			
Current Deficit	-8,411***	0,221	-6,41	-5,74	-5,32	12	01/2007	I(1)
		0,617					05/2014	

Exchange Rate	-6,816***	0,320	-6,42	-5,65	-5,32	4	11/2008	I(1)
		0,806					11/2017	
Tourism	-7,053***	0,685	-6,32	-5,73	-5,32	0	08/2015	I(1)
		0,901					08/2019	

*Note 1: ***,** and * are statistically significant at the 1,5 and 10 percent level*

According to the results obtained in Table 2; structural unit root test statistics show that Current Account Deficit, Tourism Revenues and Exchange Rate are stationary at the level of 1% in both fixed and trend models. In addition, it was seen that the null hypothesis that all series have unit roots was not rejected and they became stationary after the first differences were taken. Thus, it is concluded that all series are I(1).

It is seen that the dates revealed as a result of the unit root test emphasize the effects experienced in certain periods in Türkiye. In 2005, the number of tourists in Türkiye increased by 20.6% compared to the previous year and reached 21 million, breaking the record of that period. However, despite the increase in the number of tourists in 2005 and after, the inflation targets could not be reached due to the exchange rate fluctuations experienced in 2006 and the resulting increased inflation. At the same time, the current account deficit of USD 25.3 billion in the January-September period of 2006 brought along the comments of economic and political instability. According to the data announced in January 2007, after the uncertainties experienced in 2006, the current account deficit increased by 37.2% compared to the previous year and reached the level of 31 billion 316 million USD (Erkılıç, 2006: 99; CBRT, 2006: 1-5). After 2008, the crisis that started in Europe, Türkiye's largest export market, caused Türkiye's exports to fall from 140 billion USD to 110 billion USD. After this period, Türkiye found new export markets, but still the current account deficit continued to increase as imports outstripped exports. In 2010, just after the 2008 crisis, while tourism income has increased worldwide, tourism income decreased in Türkiye (Şen and Şit, 2015: 37). According to the data announced in April 2014, the lowest current account deficit since 2010 was obtained with 4.8 billion USD (İşbank (22.11.2021)). The reason for this development in 2014 is the exchange rate policies implemented by the government after 2011. In November 2011, the government used the reserve option mechanism and the upper limit of the interest rate corridor as a policy tool in order to prevent changes in the exchange rate in order to ensure price and financial stability, and additional monetary compression was carried out (Çiftçi, 2014: 130; Değerli and Fendoğlu, 2013: 2). Between 2014 and 2018, the Dollar exchange rate continued to fluctuate. However, after the Pastor Brunson incident in 2018, the USA started to impose harsh sanctions on Türkiye and the dollar rose from 4.59 TL to 7 TL overnight and reached its historical level of 7.52 TL. After the easing of the tension between the two countries, the US dollar decreased to the level of 5.85 TL, but the general fluctuation in the Exchange Rate

continued, reaching a record level of 17.5046 TL in the last quarter of 2021. Tourism, on the other hand, has continued to increase since 2008, breaking the record before the Pandemic in 2019, hosting 51.7 million tourists and generating 34.5 billion dollars in revenue. In addition, current account surplus was recorded for the first time after 18 years in 2019 (Sezal, 2020: 26; TCMB Electronic Data Distribution System (EVDS) website (22.11.2021). As a result of the values obtained from the series, it was concluded that all series are stationary and Maki (2012) Multiple Breakage Co-integration test can be applied to examine the long-term relationship of the series.

Table 3: Maki (2012) Co-integration Test

TEST STATISTICS		CRITICAL VALUES			DATES OF STRUCTURAL BREAKTHROUGH		
		%1	**%5**	**%10**			
MODEL 0	-5,54***	-5,541	-5,505	-4,733	01/2005	09/2012	06/2015
					02/2019	02/2020	
MODEL 1	-6,17***	-6,329	-5,831	-5,558	12/2003	11/2009	02/2019
MODEL 2	-4,53*	-6,020	-5,558	-5,287	02/2005	01/2010	09/2012
					02/2019	04/2020	
MODEL 3	-5,82**	-6,523	-6,055	-5,795	04/2005	01/2010	01/2014
					02/2019	02/2020	

Note 2: Maki (2012) are critical values with %1,%5 and %10 significance level taken from Table'1

***, ** and * are statistically significant at the 1,5 and 10 percent level

According to the Maki (2012) Co-integration Test results, it has been determined that there is a co-integration relationship between the variables, since the test statistics are greater than the critical values in all models. Among the data, a significance of 10% according to Model 0, Model 1, Model 2, and 5% according to Model 3 was determined.

The results of the Maki Co-integration Test, which was performed by adding a dummy variable to the model in order to eliminate the effects of the Covid-19 (Coronavirus) pandemic and the 2008 global crisis on the data, are given in Table 4.

Table 4: Maki (2012) Co-integration Test with Dummy Variable (Covid-19 and 2008 Crisis)

TEST STATISTICS		CRITICAL VALUES			DATES OF STRUCTURAL BREAKTHROUGH		
		%1	%5	%10			
MODEL 0	-6,25**	-6,296	-5,760	-5,491	08/2004	01/2010	02/2015
					06/2018	03/2020	
MODEL 1	-6,02**	-6,011	-5,518	-5,247	08/2004	06/2006	01/2010
					04/2011	06/2018	
MODEL 2	-5,75**	-6,020	-5,558	-5,287	08/2004	06/2009	08/2010
					10/2014	06/2018	
MODEL 3	-7,13**	-7,153	-6,657	-6,397	08/2004	08/2009	04/2011
					06/2018	08/2019	

Note 3: Maki (2012) are critical values with %1,%5 and %10 significance level taken from Table'1

***, ** and * are statistically significant at the 1,5 and 10 percent level

According to the results of Maki (2012) Co-integration Test with Dummy Variables, it has been determined that there is a co-integration relationship between the variables since the test statistics are greater than the critical values in all models. Among the data, 5% significance was determined according to Model 0, Model 1, Model 2 and Model 3.

When the data in Table 3 and Table 4 are examined, it is seen that different dates are obtained from each other and when the process is taken into account, they are important dates that are connected to each other. It also shows agreement with the breaking dates in Table 2. However, when the dates that emerged after the results obtained by the Maki (2012) co-integration test are examined, it is seen that the majority of these dates coincide with the current account deficit disclosure periods. The Current Account Deficit, which is called "Türkiye's soft belly", is of great importance in Türkiye as an indicator of economic development, as in other developing countries.

Especially when the Maki (2012) co-integration test, which includes a dummy variable, is examined, the year 2004 stands out as an important date. After the period of coalition governments in

Turkey, the single party came to power and after the steps taken, exports, which were expected to be 43.5 billion in 2003, reached 47.3 billion dollars despite the fluctuations in the exchange rate. In the same period, tourism revenues were higher than expected at USD 13.2 billion. The reason for the higher-than-expected data in 2003 to create a positive picture is the increase in labor productivity despite the fluctuations in the exchange rate (T.C. Cumhurbaşkanlığı Strateji ve Bütçe Başkanlığı (SBB)2004:44). The most striking date among the breaking dates in August 2004. In 2004, the US and the UK raised interest rates three times each and the UK's decision to raise interest rates by 0.25 basis points in August 2004 had a positive impact on the Turkish economy. Fitch, one of the International Credit Rating Agencies, changed Türkiye's credit rating to B+ on August 25, 2004, and confirmed the stable outlook as positive. In addition, in the first 9 months of 2004, Tourism Revenues increased compared to the same period in 2003. Tourism revenue, which was 8.6 billion US dollars in the first 9 months of 2003, rose to 10.2 billion US dollars in the first 9 months of 2004 with a 12.4% increase in the number of tourists. The current account deficit, on the other hand, was realized at the level of 14 billion USD. (TCMB 2004: 21-30).

In the last quarter of 2005, a Current Account Deficit of 22.9 billion dollars was recorded. The reason for this decline in the current account deficit in 2005 is the decrease in exports since the second quarter. However, the increase in tourism income in 2005 and reaching the level of 32.6 billion USD enabled the growth in the Current Account Deficit to be prevented to some extent (TCMB 2005:1). The month of June stands out as the most important date that caught our attention in 2006. The direction of the liquidity flowing to developing countries in 2006 is reverting to developed countries. Türkiye, on the other hand, was among the developing countries that were most affected by this situation at that time. Türkiye has taken a series of measures in order to prevent the fluctuation in the exchange rate after the change in liquidity. The most important of these is the decision of the Monetary Policy Committee (PPK) to increase the policy rate by 1.75 basis points and then by 2.25 basis points on the 7th and 25th of June 2006. In addition, due to the uncertainty in commodity prices on July 20th, the TCMB policy rate was increased by 0.25 basis points. According to the data obtained in the third Quarter of 2006, Tourism decreased by 8.8% and there was a 6.9% decrease in Net Tourism Income. As a result of this situation, the Current Account Deficit reached USD 28 billion (TCMB, 2006: 1-5).

The 2008 Global Economic Crisis, which started to be felt most in the USA as of 2008 and then affected the whole world, went down in history as the biggest crisis experienced after the "Great Depression". Türkiye was affected by this crisis and the GDP turned negative in 2009 (Demirbaş and Sancak, 2011: 1). However, when we come to 2009, it is seen that the USA grew for 4 consecutive quarters in seasonally adjusted terms and achieved a growth rate of 0.9, and this situation positively affected the world economy (TCMB, 2009: 4). The recession experienced in 2008 started to return to normal after the developments in the USA in 2009 and the increase in world imports and exports. As a result of the developments in the second quarter of 2009, the Current Account Deficit in Türkiye, which was 48.9 billion USD in August 2008, decreased to 20.5 billion USD in June 2009. The impact of the global recession continued in 2009 for the tourism sector and Tourism Revenue decreased by 10.2% in January and July (TCMB 2009: 1-15). The main reason for the increase in the Current Account Deficit is shown as the

increase in the foreign trade deficit (Konak, 2018: 168). The biggest reason for this is the increase in loan volume. The Central Bank stated that the loans used in Türkiye in 2010 were used especially for imported luxury consumer goods. The rise in domestic demand caused a significant increase in the current account deficit. The prudent credit policy, which started being implemented in 2011, caused the current account deficit to return to reasonable levels in the following periods (Göçer et al., 2013: 14). The effects of the economic crisis that occurred between 2008 and 2011 are consistent with the data obtained in Table 3 and Table 4.

The current account deficit decreased after 2011, albeit with fluctuations, decreased from $47.96 billion in 2012 to $20.75 billion in 2018. After 2018, there was an increase in the dollar rate and other exchange rates due to the sanctions made by the USA after the Pastor Brunson incident. Due to the record number of tourists in 2019 and the increase in exports in 2020, there was a current surplus in 2019 and 2020. It is noteworthy that the current account deficit was 1.2 billion USD in February 2020 (SBB website (12.02.2022)).

In the Maki (2012) co-integration test, two separate tests were conducted by considering the model with and without dummy variables. The data obtained in the two tests were transferred to the tables and the varying dates were obtained. However, when these dates are taken into account, it is noteworthy that their common features are the changes related to the Current Account Deficit. As a result, when the findings reflecting the dates examined are taken into account, it is seen that the Exchange Rate and Tourism Income have a very large impact on the Current Account Deficit. However, it is noteworthy that these are not the only factors, and the changes in the Current Account Deficit are caused by many factors.

As seen in Table 3 and Table 4, there was a co-integration relationship between the variables since the test statistics were greater than the critical values in all models. It was concluded that Wald Statistical Granger Causality Test can be done since co-integration was detected between the variables.

Table 5: Wald Statistics Granger Causality Test

	Wald test	Bootstrap p-value	Asymptotic p-value	Wald test	Causality
Tourism →Exchange Rate	7,111	0,770	0,790	ACCEPT	NONE
Current Deficit → Tourism	10,369	0,478	0,498	ACCEPT	NONE
Tourism → Exchange Rate	1,622	0,192	0,203	ACCEPT	NONE

Exchange Rate → Tourism	1,789	0,187	0,181	ACCEPT	NONE
Current Deficit → Exchange Rate	9,418	0,641	0,667	ACCEPT	NONE
Exchange Rate → Current Deficit	13,099	0,360	0,362	ACCEPT	NONE

Note 4: ***, ** and * are statistically significant at the 1,5 and 10 percent level. Critical values were obtained with 1000 boostrap cycles.

If the Wald statistical value is greater than the data in the Z table, it is not accepted, and if it is small, it is accepted. Moreover, in the Granger causality test, the Wald statistic being significant means that there is no causality and the null hypothesis is rejected. In the light of this information, when the data in Table 5 are examined, it is concluded that there is no long-term causality relationship in Tourism-Current Account Deficit, Current Account Deficit-Tourism, Currency-Tourism, Currency-Current Account Deficit, and Current Account Deficit-Currency. Different from the results obtained in this study from results of Cinel and Yolcu (2021), Sacak, Akar, and Gülmez (2019), Sancar and Akbaş (2019), Tobing and Narayan (2020) and Şit (2016). They made studies on the current account deficit and tourism and according to the results obtained, they determined that there is a direct, positive, and strong effect between Tourism and the Current Account Deficit. In addition, Saçık, Akar, and Gülmez (2019) concluded in their study that there is a bidirectional causality relationship between the current account deficit and tourism. Sağdıç and Duman (2021) stated in their study that, contrary to the results of this research, there is a bidirectional causality relationship between Exchange Rate and Current Account deficit. The causality results of all mentioned studies do not coincide with the findings of this study.

6. **Conclusion And Recommendations**

In the study, Tourism Income, Current Account Deficit, and Exchange Rate data in 2003:01-2021:06 were used. The effect of fluctuations in the current account deficit and exchange rate on Türkiye's tourism income was examined. In addition, it was also examined how the Current Account Deficit, Exchange Rate, and Tourism Income were affected by the worldwide lockdown during the pandemic period. First of all, Lee and Strazicich (2003) unit root test with structural break was used to check the stationarity of the series. As a result of the findings, since the series have a unit root and are not rejected according to the null hypothesis (not being stationary), the differences from the first stream are taken to ensure (I1) stationarity.

As a result of the series being stationary at the first difference (I1), the Maki (2012) co-integration test, which allows up to five breaks, was applied. Since the values found according to the results of the test

are greater than the critical values, it is concluded that there is a co-integration relationship between the series and that the series move together in the long run.

After determining the co-integration relationship, Wald Granger Causality test was applied to determine the causality relationship between the series. As a result, it was concluded that there is no causality relationship between Tourism Income, Current Account Deficit and Exchange Rate.

The fact that no causal relationship was found between Tourism Income, Exchange Rate, and Current Account Deficit is not an expected result due to the importance of the variables. However, according to the literature review and the results of the findings, it was concluded that the variables were actually more affected by the other variables compared to each other. The dates obtained as a result of the tests have been carried out have revealed the importance of the current account deficit in Türkiye.

Tourism Income is seen as an indispensable source of income for Türkiye and developing countries such as Türkiye, the cornerstone of the balance in the current account, and the main source of foreign currency input. In addition, especially after 1980, Turkey has become more aware of the importance of tourism income for Turkey and started to use the socio-economic, natural, and historical structure of the country as a marketing tool like other developing countries. As a result of these policies, Türkiye continues to increase its tourism income day by day. Although the tourism sector has a fragile structure due to the fact that it is affected very quickly by socio-economic events and natural events, it has not been affected much by these situations due to Türkiye's high preference among Mediterranean countries. Even though Türkiye experienced a lot of negativity due to its economic structure, political developments, and many natural disasters (the 99 earthquake, July 15 coup attempt, Pastor Brunson incident, etc.). After 1980, the number of tourists continued to increase every year.

Exchange Rate has become another topic of great importance for Türkiye, especially with the transition to the floating exchange rate system after the 2001 crisis. After the floating exchange rate system, the exchange rate in Türkiye has been in an ever-rising trend. However, when the Exchange Rate and Tourism Income are taken into account, it is seen that they are both in a constantly rising trend. Although this trend shows a closing feature on the Current Account Deficit in certain periods, it has been seen that this situation is short-lived. In addition, even if fluctuations in the exchange rate seem to have positive effects on the current account deficit, it is understood that this situation has more negative effects in the long run. The reason for this situation, as a result of many literature studies, is that the growth or contraction in the current account deficit is caused by changes in the country's import and export rates. Considering the dates obtained as a result of the analysis, it is concluded that the three variables examined are not affected by each other, on the contrary, they are more affected by other factors. Moreover, the finding that there is no causality relationship between Tourism Income, Exchange Rate, and Current Account Deficit is consistent with and confirms the study by Uslu (2019). On the other hand, Lamsso and Masoomzadeh (2017), in their study of the ten countries with the highest number of tourist arrivals, point out that an

increase in the exchange rate has a negative effect on the current account deficit and a positive effect on the tourism income in the short run, but this situation differs between countries.

Considering the break dates and results obtained in the study, the importance of the current account deficit in the national economy is observed. The value of the current account deficit, exchange rate, and tourism income for the country will always be of great importance. However, it is obvious that focusing only on these variables will produce results that cannot go beyond the country's standing still and even its regression. The main indicator of this situation is that the Current Account Deficit and Exchange Rate, as discussed earlier, do not have an effect on Tourism Income. The results confirms this situation.

The most important issue understood by countries, especially after the import and export restrictions as a result of the Covid-19 pandemic, is self-sufficiency. Therefore, Türkiye should learn from this situation. It should change its import substitution policies and should not rely solely on tourism revenues. By developing production-based policies, Turkey should develop its industry, increase its exports, and should reach the level of developed countries. It is noteworthy that the biggest factor in the increase in tourism income is the level of development of countries. When the tourist potential and structure of the developing countries are taken into consideration, it is seen that there is a difference that cannot be compared with the developed countries. The level of development is the most important factor in the increase of tourism income for tourists with different economic statuses and cultural structures to prefer the country and to increase tourist diversity.

The increase in disposable income in the world and people's making tourism activity a habit, meeting this need has become mandatory. In order to get a share of the pie, it is essential to implement appropriate policies, make investments and make the country a center of attraction not only for the tourism sector but also for other sectors and areas. In future studies, it is necessary to examine the relationship between tourism and other macro (GDP, export income, etc.) and micro (investment, employment, etc.) variables with different periods and methods.

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