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Analyzing the Impact of Consumer Confidence Index and Geopolitical Risk Indices on Foreign Trade in Food Commodities: Evidence from Turkey

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Abstract

In recent years, the increase in global crises in areas such as climate, food, health, and international relations has led to an increase in the level of interest of both economists and senior managers in macroeconomic indicators. In this context, the consumer confidence index and the geopolitical risk index have become increasingly popular in both econometric analyses and academic discussions. In this study, the effects of consumer confidence and geopolitical risk indices on food imports and exports in Turkey for the period between January 2013 and January 2021 were analyzed through symmetric and asymmetric causality analyses. The consistent results of the Toda Yamamoto causality and Hatemi-j asymmetric causality tests indicated that a decrease in the consumer confidence index in Turkey leads to a decrease in exports of processed food goods and an increase in geopolitical risk leads to an increase in imports of unprocessed food goods.

Key words: Consumer Confidence, Geopolitical Risk, Food Export, Food Import

JEL Code: M31, M16

1. Introduction

Many countries take measures regarding food exports especially in crisis periods. For example, various restrictions were imposed on food exports in many countries during the 2008 food price crisis, and some are now reintroducing similar restrictions due to the Covid-19 pandemic (Mogues, 2020). Reminiscent of the food export restrictions applied in 33 countries to protect their citizen from further rises

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in local food prices during 2007-2008 food crises (Sharma, 2011), 17 countries introduced export restrictions on food products since April 2020 which represents around 5 percent of globally traded calories (Laborde et al., 2020). After the first four weeks of the Covid-19 pandemic, it expanded to 21 countries and about 8 percent of total calories traded were affected at its peak in May and June of 2020 (Glauber et al., 2022).

According to the Food and Agriculture Organization of the United Nations (FAO, 2022), the war in Ukraine has surrounded two of the most important exporters of agricultural commodities at a time when international food and input prices are already high and volatile. This raises significant concerns about its potential negative impact on food security and causes many types of risks such as trade risk, price risk, and exchange rate, debt, and growth risks, both domestically and internationally. From the domestically point view, combined with limited economic activity and rising prices, this could directly constrain countries' agricultural production and reduce the purchasing power of local people. According to Sezgin (2022), the crisis will have a detrimental impact on Turkey's agricultural exports to both Russia and Ukraine. To the greatest extent possible, less tomatoes and citrus fruits are expected to be exported.

While the war continues, on the other hand, the long-term effects of COVID-19 and their repercussions continue to be seen. According to Komurcu et el. (2022), people and countries are not just experiencing an economic crisis during the COVID-19 epidemic, which is unprecedented. It is a time when a new world order is possible yet there is still ongoing uncertainty. In the light of all these developments and uncertainty, the food supply shock undoubtedly necessitates Turkey’s involvement in the problem and possible solution as an important party due to its geopolitical position. Therefore, the relationship between geopolitical risk as an external environmental factor and consumer confidence as an internal factor with both food imports and food exports is worth examining.

In this paper, we ask the following research question: How do consumer confidence and geopolitical risk affect the food export and import? To answer this question, we used Toda Yamamoto causality and Hatemi-j asymmetric causality tests. The rest of the paper is organized as follows: Section 2 reviews recent studies on consumer confidence, geopolitical risk, and food trade. Section 3 describes the data set and methodology. Section 4 reports the findings. Section 5 concludes.

2. Literature Review

Today, almost all countries of the world are engaged in international food trade. Although consumer preferences vary significantly in different countries, changes in the global economy and economic growth in Asian countries play a role in determining the nature of food demand (Otmakhova et al., 2019). According to Udmale et al (2020), international trade as part of distribution or supply chains is one of the significant components of food balance; if this is affected by any form of global shock, it could have severe and long-lasting impacts on food security.

Therefore, COVID-19 constitutes an unprecedented public health emergency that has caused a severe economic slowdown, poses a threat to food production, and may cause supply shocks around the world. These effects could have a considerable impact on food security in countries that are trade dependent, together with unilaterally implemented trade restrictions in major producer countries. Global supply networks may be impacted by these effects until 2020 and beyond.

This exceptional pandemic had an impact on food prices as well, with some foods seeing an increase in demand while others saw a decrease. Chowdhury et al., (2021), in their recent research, demonstrated that the adverse effects of global pandemics and uncertainty on food prices. They discovered that the global food price index and the world uncertainty index have a substantial positive association at low quantiles and a large negative correlation at high quantiles. In recent years, geopolitical concerns have proliferated and had a significant role in the development of commodities prices (Caldara and Iacoviello, 2022). Consistent with this, Saâdaoui et al. (2022) analyzed the relationship between geopolitical risk and prices of essential food commodities and found that there is only one direction of causation, with geopolitical concerns having a major impact on food prices. The statistical significance of this relationship across frequency bands shows that the long, medium, and short terms are independent of one another.

According to Macready et al. (2020), for those in the food chain working to create and market food items, a lack of trust and the resulting lack of confidence provide a challenge. It is comforting to know that consumer trust is mostly dependent on cognitive perceptions of reliability. Because cognitive beliefs are more susceptible to change and can be changed more quickly than spontaneous affective reactions, consumer trust is a concept that can be discussed. Consumers take steps to reduce food dangers, such as switching foreign goods for domestic ones. Because the COVID-19 pandemic was brought on by a problem with food safety, it's critical to investigate long-term consumer confidence and how it affects consumption patterns by first estimating consumer confidence in food products (Abbas et al., 2022). Thus, it is important to understand the impact of both geographical risks and consumer confidence on food export and food impact.

2.1 Consumer Confidence

According to the definition of OECD (2020), consumer confidence is an economic indicator which measures the degree of consumers' optimism or the feelings about the economy's overall state, as well as their financial situation (Baharudin et al., 2021: 102). A summary of the literature on the consumer confidence index, which is a macroeconomic indicator that is frequently the subject of research in the academic literature with the Covid-19 pandemic, is presented below.

Nowzohour & Stracca (2020: 721) analyzed monthly macroeconomic data of 27 developed countries between 1985 and 2016 and found that consumer

confidence is the most relevant variable for all economic and financial data. Juhro and Iyke (2020: 375) also confirmed that the consumer confidence index is an important predictor of both consumption expenditures and economic growth in Indonesia between 2000:01 and 2019:01.

In their research, Sandoval, and Walsh (2020: 757) found that the effect of consumer confidence index on consumption expenditures is higher for durable goods, especially automobiles. The reason for this is thought to be that durable consumption expenditures are discretionary expenditures at a higher rate than nondurable consumption. Likewise, the research of Baharudin et al. (2021: 109) reveals that food consumption was the least adversely affected expenditure with the declining consumer confidence during the pandemic measures implemented in Malaysia.

In addition to the influence of the consumer confidence index on food consumption, consumers' trust in food chain actors is also considered to be an important influencer of the consumer confidence index. Analysis of Macready et al. (2020) showed that consumer confidence is largely determined by consumer beliefs about the trustworthiness of food chain actors. In particular, the beliefs about openness, and especially about the openness of food manufacturers, are strongly related to consumer confidence. Thus, it can be said that consumer confidence index has a bidirectional relationship with food consumption.

In recent years, there are also academic studies investigating the effects of the consumer confidence index on the Turkish economy. For example, Beybur (2022: 86) finds that there is a long-run reciprocal relationship between deposit dollarization and consumer confidence index variables in Turkey in the period between 2012:01 and 2022:01, while Tatlı and Koç (2021: 773) state that consumer confidence index has a positive and significant effect on retail sales volume in Turkey in the long run in the period between 2010:01 and 2015:12.

Başarır et al. (2019: 173) discovered the causality relationships from consumer confidence index to industrial production index and from BIST100, USD exchange rate and CPI to consumer confidence index in Turkey in the period between 2012:1 - 2018:6. The research findings show that a shock to the USD exchange rate has a negative effect on the consumer confidence index and a shock to the consumer confidence index has a negative effect on the BIST100 index and the USD exchange rate.

2.2 Geopolitical Risk

According to the results of the research conducted by Fossung et al. (2001: 15) on the firms in the S&P 500 (Standard and Poors' top 500 firms of the U.S.) list for the period between 1962 and 2020, the share values of firms operating in the consumer goods sector are negatively affected 5 days after the events involving geopolitical risk.

Findings of Zhou et al. (2020: 1) also showed that geopolitical risks have significant and differential effects on both stock returns and stock volatility in China's rare metal stock market. Akadiri et al. (2020: 277) analyzed the effects of the geopolitical risk index on the tourism industry and economic growth in Turkey and found that there is a unidirectional relationship from the geopolitical risk index to both tourism and real GDP of Turkey and that real GDP and tourism respond negatively to standard deviation shocks to geopolitical risk both in the short and long run.

The consumer confidence index has been a variable that is generally ignored in both traditional consumption theories and applied literature to explain the consumption function. However, the consumer confidence index contains important information on the current and future economic situation, savings and consumption tendencies of households (Yamak et al. 2019: 511).

Oduh et al. (2012: 86) stated that there is a positive relationship between consumer confidence index and purchase intentions in Nigeria. According to the results of the analysis of panel data collected between 2009 and 2011, a 10% increase in consumers' optimism increases their planned purchases by approximately 1.4%. The study of Topuz (2014: 243) also revealed that consumer confidence level does not have a significant effect on non-food retail sales, but may have an effect on food products and total retail sales.

Turnalı and Özkan (2016: 62-63) found that there is a long-run relationship between consumer confidence index and consumer price index in Turkey in the period between January 2004 and December 2015. They also revealed a unidirectional and short-run causality from CPI to CPI. This shows that the prices of goods and services and their reflection on the final consumer is one of the most important factors affecting consumers' thoughts about the future of the economy.

3. Methodology

This study aimed to investigates how consumer confidence index effects food export-import in Turkey. Therefore, it was determined the variables of the Consumer Confidence Index, unprocessed food imports, processed food imports, unprocessed food exports in Turkey. Then, the Toda-Yamamoto (1995) and Hatemi-J (2012) Asymmetric Causality tests were run in period of January 2013 and January 2021 by using monthly data. In the study, it was taken the consumer confidence index as an independent variable while the unprocessed food imports, processed food imports, unprocessed food exports were determined the dependent variables. Equations were established so that two tests for each dependent variable. Zivot-Andrews Unit Root Test was used in the unit root analysis of the data of all variables, and the breaking dates of the data were also given.

3.1 Data

The study consists of six variables, two independent and four dependents. The abbreviations of the variables, the covered periods and the information about the data sources are given in the table.

Table 1. Data set

Variables	Variables Description	Periods	Sources
CCI	Consumer Confidence Index	August 2013-August 2020 Monthly data	TCMB, 2021
UPIMP	unprocessed food imports		
PIMP	processed food imports		
UPEXP	unprocessed food exports		
PEXP	processed food exports		
GPRTR	Geopolitical risk index of Turkey		EPU, 2021

Source: Authors' explanations

3.2 Hypotheses

In the research, hypotheses have been established that question the existence of a causality relationship between the variables. For the Toda and Yamamoto (1995) these hypotheses established for study are as follows.

H_0: The X variable is not the Granger cause of the Y variable.
H_1: The X variable is the Granger cause of the Y variable.

For the Hatemi-J (2012) Asymmetric Causality, these hypotheses established for study are as follows.

H_0: There is no causal relationship between CCI, GPRTR and UPIMP, PIMP, UPEXP, PEXP.
H_1: There is causal relationship between CCI, GPRTR and UPIMP, PIMP, UPEXP, PEXP.

4. Findings

4.1 Zivot-Andrews Unit Root Test

In this study, the C model of the Zivot-Andrews test was taken into account to determine the breakage of the series. the Zivot-Andrews Unit Root Test, which is a test that allows structural breakage, was developed by Zivot and Andrews (1992). With the C model, 1 structural break are obtained in both level and trend series. The first difference of the series that were not stationary at level was taken

and Zivot-Andrews unit root test was applied again. These findings are shown in Table 2.

Table 2. The results of the Zivot-Andrews Unit Root Test

Zivot-Andrews (Model C)						
Series	**I(0) Test Statistic**	**I(0) Breaking Date**	**Critical Values**	**I(1) Test Statistic**	**I(1) Breaking Date**	**Critical Values**
CCI	-6.47	October 2018	-5.08	-	-	-5.08
GPRTR	-6.92	June 2015	-5.08			
UPIMP	-6.69	April 2015	-5.08	-	-	-5.08
PIMP	-6.67	August 2018	-5.08	-	-	-5.08
UPEXP	-4.13	September 2018	-5.08	-5.13	September 2013	-5.08
PEXP	-7.39	August 2018	-5.08	-	-	-5.08

**: It is significant at 5% level.

According to Table 2, the intercept and trend-breaking model C results obtained from the Zivot-Andrews unit root test, it was shown except of the UPEXP are stationary at the I (0) level. However, it was observed to stabilize after taking a difference for UPEXP. it was observed that there was no unusual situation, and the movements in the usual political and economic policies caused these breaks.

4.2 Toda-Yamamoto Causality Test

This method, developed by Toda and Yamamoto (1995), was created to take the Granger causality test to a higher level. In addition, the model tries to enhance some of the problems that occur in the Granger causality test. To be able to test Granger causality for time series, the series must first become stationary and stabilize at the same level. However, once this condition has been met, co-integration must also occur to demonstrate a long-term relationship between stationary series at the same level. In other words, only the Granger causality test can be performed between the series that are stable at the same level and have a cointegration relationship between them. However, the Toda-Yamamoto test revealed that time series, which are at different levels of stability, may have causality between them, and even causality testing can be done without the need for a stationary test. This model can also be tested regardless of whether there is a co-integration between the series, regardless of co-integration (Toda and Yamamoto, 1995: 246)

In the case of the performing Toda and Yamamoto (1995) test, the appropriate lag length (k) is determined by the VAR model. In the second stage of the analysis, the degree of integration (d_max) of the variable, which has the highest degree of integration, is added to the lag length (k) of the model. In the last stage, the VAR model is estimated according to the lags with series level values (k +

d_max). The VAR model is applied with the help of the following equations (Toda and Yamamoto, 1995: 230).

$$Y_t = a_0 + \sum_{i=1}^{k+d_{max}} a_{1i} Y_{t-i} + \sum_{i=1}^{k+d_{max}} a_{2i} X_{t-i} + u_t \quad (1)$$

$$X_t = \beta_0 + \sum_{i=1}^{k+d_{max}} \beta_{1i} X_{t-i} + \sum_{i=1}^{k+d_{max}} \beta_{2i} Y_{t-i} + v_t \quad (2)$$

In the Toda-Yamamoto test, the basic hypothesis and alternative hypothesis can be discussed as follows.

H_0: The X variable is not the Granger cause of the Y variable.

H_1: The X variable is the Granger cause of the Y variable.

The success of the Toda-Yamamoto causality test is directly related to the correct determination of the value of the series (d_{max}) and (k) in the model.

Table 3. Toda-Yamamoto causality test results for CCI

Dependent Variables	**Independent Variable**	**dmax**	**k**	**Chi-Square Test Statistics**	**Probability**	**Causality and Direction**
UPIMP	**CCI**	1	0	0.527464	0.4677	**CCI ≠> UPIMP**
PIMP		1	0	0.314938	0.5747	**CCI ≠> PIMP**
UPEXP		1	1	0.022831	0.8799	**CCI ≠> UPEXP**
PEXP		1	0	2.273263	0.0916	**CCI => PEXP**

**: It is significant at 5% level.

As seen in Table 3, while CCI was determined as independent variable, other variables took place as independent variables. The optimal lag length was determined according to the criterion SC, dmax = the maximum stationarity level according to the unit root test of Lee Strazicich, k = VAR denotes the lag length. All variables are evaluated in equations as both dependent and independent variables. At the end of the analysis, it was obtained no meaningful relations in all. It was seen that the established H_1 hypothesis is accepted. The H_0 hypothesis is rejected.

According to Table 4, GPTR was determined as the independent variable. GPRTR only did not have a causal effect on others of the UPIMP effects. A causality relationship was determined at the 10% significance level.

Table 4. Toda-Yamamoto causality test results for GPRTR

Dependent Variables	Independent Variable	dmax	k	Chi-Square Test Statistics	Probability	Causality and Direction
UPIMP	**GPRTR**	1	0	2.891208*	0.0891	**GPRTR => UPIMP**
PIMP		1	0	0.025271	0.8737	**GPRTR ≠> PIMP**
UPEXP		1	1	0.020313	0.8867	**GPRTR ≠> UPEXP**
PEXP		1	0	0.108031	0.7424	**GPRTR ≠> PEXP**

* 10%

4.3 Hatemi-J Asymmetric Causality Analysis

In asymmetric causality analysis tests, it is argued that there is actually a hidden relationship between two time series, which cannot be correlated at first glance, and that there is no relationship between them, and that these hidden relationships can only be found by considering the asymmetry between the components. The asymmetric causality test, which was first introduced to the literature by Granger and Yoon (2002), was developed by Hatemi-J (2012), and causality is investigated by dividing variables into positive and negative components. In this asymmetric causality analysis, it is aimed to find hidden relations that will help to understand the dynamics of the series and allow to develop possible predictions for the future.

In the case of the run the causality relationship between two integrated variables y_{1t} and y_{2t} as follows (Hatemi-J, 2012: 449-450);

$$y_{1t} = y_{1t-1} + \varepsilon_{1t} = y_{10} + \sum_{i=1}^{t} \varepsilon_{1i} \qquad ve \qquad y_{2t} = y_{2t-1} + \varepsilon_{2t} = y_{20} + \sum_{i=1}^{t} \varepsilon_{2i} \quad (3)$$

Here, $t = 1, 2, \ldots T$, denotes the constant terms, y_{1t} and y_{2t} denotes initial values, ε_{1i} and ε_{2i} error terms. Positive and negative shocks are expressed as in equation (4);

$$\varepsilon_{1i}^{+} = \max\ (\varepsilon_{1i}, 0)\,, \varepsilon_{2i}^{+} = \max\ (\varepsilon_{2i}, 0), \varepsilon_{1i}^{-} = \min\ (\varepsilon_{1i}, 0) \quad ve \quad \varepsilon_{2i}^{-} = \min\ (\varepsilon_{2i}, 0), \qquad (4)$$

However, Its expressed as $\varepsilon_{1i} = \varepsilon_{1i}^{+} + \varepsilon_{1i}^{-}$ ve $\varepsilon_{2i} = \varepsilon_{2i}^{+} + \varepsilon_{2i}^{-}$

Based on these, it is possible to rewrite equations (3) and (4) as follows

$$y_{1t} = y_{1t-1} + \varepsilon_{1t} = y_{1,0} + \sum_{i=1}^{t} \varepsilon_{1i}^{+} + \sum_{i=1}^{t} \varepsilon_{1i}^{-}, \quad (5)$$

$$y_{2t} = y_{2t-1} + \varepsilon_{2t} = y_{2,0} + \sum_{i=1}^{t} \varepsilon_{2i}^{+} + \sum_{i=1}^{t} \varepsilon_{2i}^{-}. \quad (6)$$

Lastly, the positive and negative shocks in each variable are expressed in cumulative form as

$$y_{1t}^{+} = \sum_{i=1}^{t} \varepsilon_{1i}^{+}, \qquad y_{1t}^{-} = \sum_{i=1}^{t} \varepsilon_{1i}^{-}, \qquad y_{2t}^{+} = \sum_{i=1}^{t} \varepsilon_{2i}^{+}, \qquad y_{2t}^{-} = \sum_{i=1}^{t} \varepsilon_{2i}^{-}, \quad (7)$$

Then, assuming that is $y_t^{+} = y_{1t}^{+}, y_{2t}^{+}$, the causality relationship between the positive components is tested through the p delayed vector autoregressive model (VAR). VAR (p) model is expressed as in equation (8);

$$y_t^{+} = v + A_1 y_{t-1}^{+} + \cdots + A_p y_{t-1}^{+} + u_t^{+} \quad (8)$$

Here, y_t^{+} indicates a variable vector of size 2x1, v is constant variable vector of size 2x1, u_t^{+} is error term size of 2x1, and A_r is expressed as a parameter matrix of "r" order, which is determined using 2x2 size delay length information criteria. The following equation is used to determine the optimal lag length:

$$HJC = \ln\left(\left|\widehat{\Omega}_j\right|\right) + j\left(\frac{n^2 lnT + 2n^2 \ln(\ln T)}{2T}\right), \qquad j = 0, \ldots, p \quad (9)$$

$\left(\left|\widehat{\Omega}_j\right|\right)$ shows j length of the lag of the estimated VAR model's error term is variance-covariance matrix, n is the number of equations in the VAR model, and T is the number of observations.

After the lag length is determined, the Wald statistic is used to test the H_0 fundamental hypothesis, which indicates the absence of Granger-causality between series. The VAR model equation created to obtain the Wald statistics is as follows.

$Y = DZ + \delta$ the equation is more clearly expressed.

$Y: = (y_1^{+}, y_2^{+}, \ldots, y_T^{+})$

$D: = (v, A_1, A_2, \ldots, A_p)$

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$$Z_t := \begin{bmatrix} 1 \\ y_t^+ \\ y_{t-1}^+ \\ \vdots \\ y_{t-p+1}^+ \end{bmatrix} \quad (10)$$

$$Z: = (Z_0, Z_1, \dots, Z_{T-1})$$

$$\delta: = (u_1^+, u_2^+, \dots, u_T^+)$$

According to equation (10): it refers to matrixes of different sizes $Y: (n\ x\ T)$, $D: \big(n\ x\ (1 + np)\big)$, $Z_t: ((1 + np)\ x\ 1)$, $Z: ((1 + np)\ x\ T)$ and $\delta: (n\ x\ T)$.

The basic hypothesis ($H_0: C\beta = 0$) which states that there is no Granger causality, is tested with the Wald statistic. The Wald statistics can be calculated with the help of the following equation.

$$Wald = (C\beta)'[C((Z'Z)^{-1} \otimes S_U)C']^{-1}(C\beta) \quad (11)$$

Equation in equation (11) is in the form of $\beta = vec(D)$ and indicates the column clustering operator. $\otimes$ Kronecker, C represents the indicator function including constraints. The variance-covariance matrix calculated for the unconstrained VAR model is expressed as $S_U = \frac{\widehat{\delta}_U' \widehat{\delta}_U}{T-q}$. And here, the q h represents the number of lags in the VAR model.

4.4 The Results of the Hatemi-J Asymmetric Causality Analysis

In this part of the study, the causality between Consumer Confidence Index and the unprocessed food imports, the processed food imports, the unprocessed food exports were analyzed by the asymmetric causality test introduced into the literature by Hatemi-J (2012). Hatemi-J asymmetric causality test was performed with the help of Gauss 10 econometric analysis package program. The findings related to the analysis are given with the (+) and (-) symbols in a way that positive and negative causality can be seen. In addition, both variables included in the model were examined as both dependent and independent variables.

Table 5. The results of the Hatemi-J Asymmetric Causality Analysis

Direction of causality	Wald Statistics	Bootstrap Critical Values		
		%1	%5	%10
CCI (+) > **UPIMP** (+)	1.020	7.416	4.114	2.838
CCI (-) > **UPIMP** (-)	0.011	7.747	4.284	2.909
CCI (+) > **PIMP** (+)	1.281	7.620	3.979	2.776
CCI (-) > **PIMP** (-)	1.153	8.176	4.175	2.885
CCI (+) > **UPEXP** (+)	1.020	7.470	4.089	2.732
CCI (-) > **UPEXP** (-)	2.407	7.922	4.069	2.834
CCI (+) > **PEXP** (+)	3.750	7.619	4.175	2.873
CCI (-) > **PEXP** (-)	8.042**	8.204	4.204	2.859
GPRTR (+) > **UPIMP** (+)	6.485**	7.964	4.042	2.807
GPRTR (-) > **UPIMP** (-)	0.605	7.564	4.244	2.897
GPRTR (+) > **PIMP** (+)	0.060	9.054	4.334	2.881
GPRTR (-) > **PIMP** (-)	0.009	7.690	4.092	2.779
GPRTR (+) > **UPEXP** (+)	0.643	8.798	4.273	2.811
GPRTR (-) > **UPEXP** (-)	0.005	8.117	4.054	2.809
GPRTR (+) > **PEXP** (+)	0.088	7.209	4.046	2.868
GPRTR (-) > **PEXP** (-)	1.189	8.231	4.224	2.882

** significant at 5% level.

According to the results that is shown in Table 5, the equation in which a positive -negative causality relations were tested from the CCI and GPRTR to the UPIMP, PIMP, UPEXP, PEXP. Binary causality tests were created separately for each change with CCI and GPRTR indices. According to the test results in which CCI was taken as the independent variable, it was seen that CCI only affected the PEXP index. The causality effect of negative shocks of CCI on PEXP negative shocks was determined. The Wald test statistic value (8.042) was found while the bootstrap critical value (4.204). it was found significant at a 5% significance level due to the Wald test statistic value more than the bootstrap critical value. H_0 hypothesis was rejected, H_1 hypothesis was accepted. Apart from this, according to the test results in which CCI was taken as the independent variable, it was determined that there was neither a positive nor a negative causality relationship on the other variables from CCI. H_0 hypothesis was accepted.H_1 hypothesis was rejected.

On the other hands, according to the results of the equation in which a positive and negative causality relationship were tested from the GPRTR to, the UPIMP, PIMP, UPEXP, PEXP. It was supported that there is a positive causality relationship from GPRTR towards UPIMP. Apart from this, according to the test results in which GPRTR was taken as the independent variable, it was determined

that there was neither a positive nor a negative causality relationship on the other variables from GPRTR. For equations between GPRTR to other, H_0 hypothesis was accepted.H_1 hypothesis was rejected. However, according to equation in which positive causality relations were tested from the GPRTR to UPIMP, it was found significant at a 5% significance. the Wald test statistic value (6.485) was found while the bootstrap critical value (4.042). H_0 hypothesis was rejected, H_1 hypothesis was accepted.

5. Conclusions

It is aimed to investigate the effects of consumer confidence index and geopolitical risk on food exports and imports in Turkey. Accordingly, monthly data on processed and unprocessed food exports and imports between January 2013 and January 2021 were obtained, and symmetric and asymmetric causality relationships were tested to investigate the effects of consumer confidence index and Turkey's geopolitical risk index variables on these data.

In the application part of the study, imports of unprocessed food commodities, imports of processed food commodities, exports of unprocessed food commodities and imports of processed food commodities were selected as dependent variables, while Turkey consumer price index and Turkey geopolitical risk index variables were selected as independent variables. Toda Yamamoto (1995) causality test and Hatemi -j (2012) asymmetric causality test was applied together, and it was found that both tests yielded results in the same direction.

According to the results obtained from the study, first, it was concluded from the Toda Yamamoto test that the change in the consumer confidence index is effective on the export of processed food goods. In the same way, the results of the Hatemi-J test are consistent with findings in the same direction, and it has been found that the decrease in the consumer confidence index is the determiner for the decrease in the export of processed food goods. However, it was ascertained that the change in the consumer confidence index does not explain the change in other variables. Thus, consumer confidence can be evaluated as an indicator that consumer may purchase more processed food resulting the decrease in export when consumers feel lack of confidence. This may be due to the increased intention of consumers to stock up. In addition, the fact that public authorities take steps to protect the domestic market by restricting food exports in cases of uncertainty may explain this situation.

On the other hand, the geopolitical risk index calculated for Turkey is found to be effective only on imports of unprocessed food goods. This result is confirmed by both causality tests. The results that were significant in the Toda Yamamoto causality test were confirmed by the Hatemi -J asymmetric test and it was found that the increase in geopolitical risk explains the increase in unprocessed food imports. This finding supports the impact of the consumer confidence index. Taken

together, the increase in geopolitical risk increases the import of unprocessed food, making it easier for them to be processed in the country and offered to consumers. This is an approach that both food business operators and public authorities implement as a policy. Therefore, it can be expected that whether it causes from internal factors such as consumer confidence or external factors such as geopolitical risks, it is revealed that food industry and relevant public authorities take regulatory measures and adapt practices in food trade as a precautionary measure to protect consumers.

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