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Do Oil Prices Have an Effects on Food Prices? Fresh Evidences from Türkiye

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ABSTRACT

Purpose – The purpose of this study is to investigate the relationships between oil prices and food prices for January 2003-September 2022 in Türkiye.

Design/methodology/approach – Variable associations were examined using the RALS cointegration test. The RALS-ADL cointegration test uses information in non-dispersed errors. Thus, it produces more powerful predictions for non-normal distributions compared to cointegration tests. In addition, this test avoids widespread practices such as predetermining a particular functional form.

Findings – The results show that the series have a cointegration connection. The DOLS, FMOLS, and Canonic cointegration approaches produced long-term coefficients in agreement with the discovery of a long-term association. Although the results of the applied tests were comparable, the results of the FMOLS and Canonik tests are substantially more comparable. Given that FMOLS technique is more effective than others and produces outcomes comparable to those of Canonik approach, its results have been interpreted in this situation. As a result, while having a positive sign, the exchange rate variable is not statistically significant. In terms of food prices, oil prices have a negative explanatory power. The CPI variable has a considerable impacts on both the present and future pricing of food. Our findings demonstrate that the price of oil does not always correlate with the price of food, and vice versa.

Discussion – There are certain recommendations that can be made to researchers and policymakers based on the findings. Supporting contract farming, which has recently been mentioned, will improve food sufficiency and the balance of food stocks, particularly during times of crisis. On the demand side, the preference for locally produced foods can reduce the over-reliance on food imports, which frequently worsens the country's status with regard to food prices and may lower the dryness. From this vantage point, future research can contrast oil-exporting nations and oil-importing countries in terms of the food price-oil price connection, whereas the current study focuses on the relationships between oil prices and food prices in Türkiye.

1. Introduction

Particularly since 1973, the rise in oil prices has been regarded as the main cause of economic recessions. When oil prices rise internationally, emerging economies that import it react differently than oil-exporting or developed nations. The degree to which a country is dependent on oil will determine this (Jha et al., 2009). Changes in oil prices since World War II have significantly influenced nearly all US recessions (Hamilton, 1983). It is well known that the abrupt rise in oil prices from $3.30 to $11.50 per barrel in just one year (1973) led to the oil crisis, which resulted in a global economic downturn. As a result, historical data suggests that oil price hikes may have significant, unfavorable consequences on both industrialized economies and oil-importing nations like Türkiye. A significant oil-importing nation is Türkiye. Energy demand rises as a result of rising population and rising national income due to the restricted domestic oil production. The Turkish economy is especially susceptible to fluctuations in oil prices due to rising energy demand. Sharp increases in oil prices can be bad for the Turkish economy for a number of reasons, including decreased investment and output, increased inflation, decreased consumption, and higher foreign payments (Akkoç et al., 2021).

Oil is a fundamental source of energy since it is a crucial component of industrial and agricultural output. The change in oil prices in this setting is accompanied by inflation in general and food inflation in particular. In recent years, rising oil prices have caused food prices to rise (Barsky et al., 2002; Khan & Ahmed, 2011; İbrahim & Said, 2012; Olayungbo, 2021). Food staples like rice, wheat, and corn are steadily becoming more expensive.

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According to the conventional oil price transmission mechanism, rising oil prices raise production costs, which in turn raise input costs, which raises food prices (Nazlıoğlu, 2011; Obadi, 2014). Thus, a change in oil prices has an indirect impact on our ability to meet our basic necessities (Chen et al., 2010). Oil-dependent nations see negative effects from rising oil prices on their economies, trade balances, and financial balances (Jha et al., 2009; Aydın & Acar, 2011). The reflection of international price trends on local pricing is another well-known effect of changes in oil prices. By rising energy costs, inflation expectations, and nominal wages of businesses directly or indirectly in oil-importing nations, increases in oil prices can have an inflationary effect (Ozgur et al., 2021).

Concerns about global food shortages and inflationary pressures have arisen among policymakers as a result of the ongoing increase in agricultural commodity prices (Rosegrant, 2008). Without improvements in policy, the World Bank anticipated that increasing food costs will push millions more people into poverty in 2011 (Inman, 2011). The developing nations that import food have come under a lot of strain as a result of the rising food and oil costs, which they must control in a precarious macroeconomic climate. Extreme price swings have a severe impact on economic growth as well as the food security of the underprivileged populations in emerging nations (Burbidge & Harrison, 1984; Brown & Yücel, 1999; Anoruo & Elike, 2009). Given this information, it is essential to evaluate how Türkiye's food costs are affected by changes in oil prices.

Oil prices have risen in recent years due to the energy crisis brought on by the Russia-Ukraine War and the return to normalcy after the COVID-19 pandemic, the increase in demand and production. It is said that Turkey will suffer from the increase. Petroleum products are imported to Turkey. Therefore, it is thought that fluctuations in oil prices will be adversely affected. Together with this information, the fluctuation in oil prices in Turkey underlines the importance of this study. The aim of the study is to examine the relationship between oil prices and food prices in the context of Turkey. There is no study in the literature using the RALS-ADL method. Compared to other tests in the literature, this test offers some advantages. In particular, cointegration test findings and details of non-dispersed faults that are not discussed in the literature are used. Also, a specific functional form of RALS cointegration tests eliminates common uses such as predetermination. Third, Lee et al. (2015) showed that the RALS they designed in non-normal distributions was more effective than their counterparts. As a result, it is predicted that the study will contribute to the empirical literature.

In the second part of the article, brief evaluations of some empirical studies on the effect of oil prices on food prices are given. The third section includes data and method, the fourth section includes empirical findings, and the fifth section includes results and discussion.

2. Literature Review

Globally, food costs have lately increased. The price of crude oil likewise showed an upward tendency throughout that time. More research into the dynamic relationships between food prices and oil prices is becoming more popular as a result of the rising joint movements between the world's oil and food prices (Karakotsios et al., 2021).

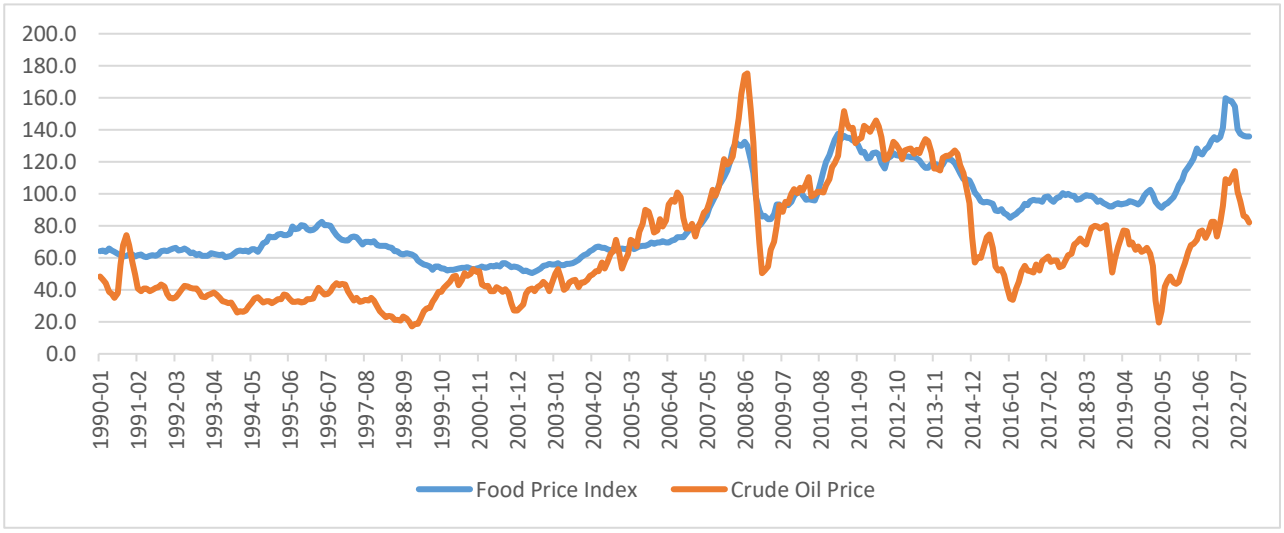

Figure 1. Global Food Price Index and Crude Oil Prices (1990-2022) **Source:** FAO and IMF.

Figure 1 illustrates food prices also decreased with the rapid fall in oil prices in 2008, and after the increase in oil prices in 2009, food prices started to rise steadily. The variability in oil prices and its impact on the domestic and foreign sectors have led to scientific debates among researchers about the nature and direction of the food and oil price relationship in recent years. Some studies have shown that volatile food prices move with fluctuations in international oil prices (Tadesse et al., 2014; Altıntaş, 2016). Therefore, significant increases in food prices may be due to various factors, and the price of crude oil undoubtedly plays an important role in the general increase in food prices. Supply and demand-side factors can be counted among other factors that cause food prices to increase (Tadesse et al., 2014). Decline in global grain productivity, insufficient global grain reserves, trade restrictions or barriers to export of key agricultural products, use of farmland for bioenergy production can be counted among supply-side factors (Obadi & Korček, 2014). The rapidly rising global population, altered food consumption habits, and urbanization in both developed and emerging nations are all driving up demand. Due to a decline in global commodity demand, global economic and financial crises have a negative impact on oil and food prices (World Bank, 2014). Researchers are concerned that oil and food prices are more closely related given that increases in food costs track increases in crude oil prices globally (Baumeister & Kilian, 2014). In this context, academic literature highlights how, among other things, rising oil prices have an impact on food costs in developing nations for a variety of reasons. Ahmadi et al. (2015) point out that when greater global economic activity boosts oil prices, the demand for food likewise rises as higher income levels change how people consume food in developing economies. Additionally, the rising cost of producing crops as a result of the higher price of crude oil causes a decrease in the supply of food products and an increase in their price (Von Braun & Pachauri, 2006; Wang et al., 2014). As a result, as Baffes (2007) notes in his paper, rising oil prices raise production costs as the cost of farm inputs such inorganic fertilizers and fuel rises, leading to higher agricultural commodity prices through cost-push effects. Additionally, rising oil prices raise the cost of international transportation, which has a negative impact on the cost of traded food commodities and hurts developing nations that import food (Dillon et al., 2015). In light of this information, Table 1 presents the studies examining the connection between oil prices and food prices.

Table 1. Literature on the Relationships between Oil Prices and Food Prices

Author(s)	Method	Time/ Country	Variables	Findings
Chen, Kuo & Chen (2010)	ARDL	2005-2008 USA	-Crude Oil Price -Corn Price -Soybean Price -Wheat Price	It was discovered that the sensitivity of the price of each grain to the price of oil rose.
Zhang, Lohr, Escalante & Wetzstein (2010)	Johansen Cointegration	1989-2008 Global	-Agricultural Products Price -Crude Oil Price -Gasoline Price	Short-run relationships between oil and agricultural commodity prices are limited.
Esmaeili & Shokoohi (2011)	Granger Causality	1961-2005 Global	-Food Price Index -Crude Oil Price -CPI -GDP	The macroeconomic index is impacted by the food production index, and the oil price index is impacted by the food production index.
Reboredo (2012)	ARMA T-GARCH	1998-2011 Global	-Agricultural Commodity Prices -Brent Oil	The price of food and oil are not overly correlated in the market.
Jebabli, Arouri & Teulon (2014)	TVP-VAR	1980-2012 Global	-Food Price -Crude Oil Price -MSCI World Stock Market Index	Shocks to the MSCI or crude oil markets during the financial crisis have immediate and short-term implications on the food markets.

Obadi & Korcek (2014)	Granger Causality	1975-2013 Global	-Agricultural Products Price -Crude Oil Price	The cost of food commodities and the price of crude oil are related over the long term. From the price of crude oil to the price of food is the direction of this relationship.
Abdlaziz, Rahim & Adamu (2016)	NARDL	1995-2014 Indonesia	-CPI -Food Price -GDP/Fixed -Crude Oil Price -Exchange -Rate/Dollar	There is a strong positive relationship between oil price and food price.
Lucotte (2016)	VAR	1990-2006 2007-2015 USA	-Crude Oil Price Index -Food Commodity -Price Index	There is a strong positive relationship between crude oil and food prices.
Nwoko, Aye & Asogwa (2016)	Cointegration - Granger Causality	2000-2013 Nigeria	-Total domestic food price volatility index -Oil Price	The volatility of domestic food prices and the price of oil are linked throughout time. Additionally, a unidirectional causality linking the volatility of oil prices to that of food prices has been established.
Altıntaş (2016)	NARDL	2000-2013 Türkiye	-Food prices -Oil price -Real national income -Energy price	There was discovered to be an asymmetric cointegration link between real income, oil, food, and energy prices.
Çınar & Hushmat (2016)	GARCH	1995-2000 Türkiye	-Agricultural -Products Producer -Price Index -Global Oil Price	Global oil price volatility has a significant impact on food prices in Türkiye.
Utkulu & Ekinci (2016)	NARDL	2003-2015 Türkiye	-CPI Change Rate -Crude Oil Barrel Price -Food price index	The global prices of food and oil have an asymmetric price pass-through to domestic inflation rates.
Damba, Bilgiç & Aksoy (2017)	BEKK GARCH	1990-2015 Türkiye	-Consumer price index -Crude Oil Price	Meat, grains, edible oils, and sugars have significant bilateral cross-correlation relationships with the return on the crude oil price.
Meyer, Sanusi & Hassan (2018)	ARDL	2001-2014 Petroleum Exporting Developing Countries	-Food Prices -Oil Price -Inflation -Commercial Openness	In the long run, there is a large and favorable correlation between rising oil costs and rising food prices.
Pal & Mitra (2018)	Trendless Cross Correlation Analysis	1990-1999 1999-2005 2005-2010 2010-2016 World	-Crude Oil Price -World Food Price Index	Positive dependency exists between the price of crude oil and the world food price index, as well as its subcategories of dairy products, cereals, vegetable oil, and sugar.
Alieva (2019)	Panel	2010-2018 11 Middle East Countries	-Food Price -Crude Oil Price -Exchange rate	There is a long-run relationship between the variables.
Alper (2018)	SVAR	2007-2017 Türkiye	-CPI -Food Price Index -Brent Oil Price	Both oil and food price shocks cause domestic inflation.

Cheng & Cao (2019)	Granger Causality, TVAR TVECM	1990-2017 Global	-CPI -Food Price Index -Brent Oil Price	The price indices for food and global crude oil have a nonlinear causal relationship.
Zmami & Ben-Salha (2019)	ARDL	1990-2017 USA	-Food Price Index -Crude Oil Price -CPI	In the long run, the general food price is only affected by positive shocks to the oil price.
Chen, Gummi, Lu & Mu'azu (2020)	FMOLS DOLS	2000-2013 2013-2019 OPEC Member Countries	-Food Price -Crude Oil Price -Real Exchange Rate -GDP	Oil costs don't necessarily fluctuate at the same rate as food prices.
Roman, Gorecka & Domagala (2020)	Cointegration - Granger Causality	1990-2020 Global	-Oil Price Index -Food Price Index	There is a long-term relationship between crude oil and meat prices.
Sarwar, Hussain & Maqbool (2020)	NARDL	1990-2019 Pakistan	-Food Prices -Non-Food Prices -Brent Oil Price	Both food and non-food inflation are impacted by oil costs. The impact is stronger in non-food inflation, though.
Taher (2020)	VAR	2013-2017 Global	-Crude Oil Price -Rice -Soybean -Wheat Price	It has been found that while there is no substantial long-term correlation between the variables, there is a strong short-term correlation between the prices of wheat and oil.
Karadaş & Koşaroğlu (2020)	Cointegration	2010-2019 Türkiye	-Food products consumer price index -Average crude oil prices -Agricultural, forestry and fishery products export and import quantity index	It has been established that the exchange rate variable influences the cost of agricultural products in a favorable way.
Karakotsios, Katrakilidis & Kroups (2021)	ARDL	2000-2015 World	-World Oil Price -World Food Price	A one-way causality relationship was found from oil to food prices.
Olayungbo (2021)	Panel ARDL	2001-2015 21 Selected Countries	-Food Import -Food Prices -GDP per Capita -Oil Price	In the short run, there were negative effects between food prices and oil prices, whereas favorable effects were seen in the long term. It has been established that the relationship between food and oil prices is causal.
Akçağlayan (2021)	NARDL	1998-2020 Türkiye	-Food Prices -Exchange rate -Real GDP -Oil Price	Food costs rise as a result of rising crude oil prices.
Algan, İşçan & Serin Oktay (2021)	NARDL	2003-2019 Türkiye	-Food Price Index -Household Consumption Expenditure -Exchange rate	The rise in oil prices has been found to have a favorable and considerable impact on food prices both in the short term and the long run.

			-Crude Oil Price Index	
Gökçe (2021)	NARDL	2010-2019 Türkiye	-Food prices -Oil prices -General energy prices -Exchange rate -Industrial production index	The long-term relationship between oil prices and exchange rates and food prices has been found to be asymmetric.
Güngör & Erer (2022)	TVP-VAR	2006-2021 Türkiye	-Food Products -Consumer Price Index -Average Real Crude -Oil Prices in TL -Real Dollar/TL Rate	During the COVID-19 period, the real exchange rate's impact on food inflation grew. It has been found that the rise in average real oil prices has a considerable impact on the inflation rate for food.

Source: This table has been prepared by the authors on the basis of the available literature.

We reviewed 30 studies in the literature. From these studies (Altıntaş, 2016; Çınar & Hushmat 2016; Utkulu & Ekinci 2016, Damba et al., 2017; Alper, 2018; Karadaş & Koşaroğlu, 2020; Akçağlayan, 2021; Algan et al., 2021; Gökçe, 2021; Güngör & Erer, 2022) for Türkiye. Other studies are in the global arena (Chen et al., 2010; Zhang et al., 2010; Esmaeili & Shokoohi, 2011; Reboredo, 2012; Jebabli et al., 2014; Obadi & Korcek, 2014; Abdlaziz et al., 2016; Lucotte, 2016; Nwoko et al., 2016; Meyer et al., 2018; Pal & Mitra, 2018; Alieva, 2019; Cheng & Cao, 2019; Zmami & Ben-Salha, 2019; Chen et al., 2020; Roman et al., 2020; Sarwar et al., 2020; Taher, 2020; Karakotsios, 2021; Olayungbo, 2021).

In these studies, many different methods were used in **ARDL** (Chen et al., 2010; Meyer et al., 2018; Zmami & Ben-Salha, 2019; Karakotsios et al., 2021); **NARDL** (Abdlaziz et al., 2016; Altıntaş, 2016; Utkulu & Ekinci, 2016; Sarwar et al., 2020; Olayungbo, 2021; Akçağlayan, 2021; Algan et al., 2021; Gökçe, 2021); **Cointegration and/or causality analysis** (Zhang et al., 2010; Esmaeili & Shokoohi, 2011; Obadi & Korcek, 2014; Nwoko et al., 2016; Cheng & Cao, 2019; Roman et al., 2020; Karadaş & Koşaroğlu, 2020; Chen et al., 2020); **GARCH** (Reboredo, 2012; Çınar & Hushmat, 2016; Damba et al., 2017); **VAR** (Jebabli et al., 2014; Lucotte, 2016; Alper, 2018; Taher, 2020; Güngör & Erer, 2022) were used.

In general, the findings obtained from the studies showed that there is a relationship between food prices and oil prices. Only in the study of Chen et al. (2020) oil price does not always move with food prices; In the study of Reboredo (2012), there is no excessive market dependence between oil and food prices. The results of these studies have reached different results from the literature.

The difference and originality of this study from the studies in the related literature; a different method and the use of more up-to-date data. Thus, it is expected that the study will contribute to the empirical literature.

3. Data and Method

3.1.Data

In this study, the relationships between oil prices and food prices in Türkiye was analyzed. The analysis covers the period January 2003- September 2022 and information on the data used is given in Table 2.

Table 2. Description of Data

Variables	Description	Source
lnfood	Food price index	TCMB-EVDS
lnoil	Crude oil prices	investing.com
lndollar	Dollar exchange rate	TCMB-EVDS
lncpi	Consumer price index	TCMB-EVDS

In the study, the variables were converted to natural logarithmic form to obtain more robust and powerful results.

3.2.Econometric Method: RALS Cointegration

In their investigation, Lee et al. (2015) employed a residual-assisted augmented least squares (RALS) cointegration test. Three crucial factors influenced the selection of this test. First, information about non-normally distributed faults that aren't taken into account in the literature is employed using the RALS cointegration test. The majority of time series in finance have a leptokurtic distribution (an asymmetric or non-linear behavior trend is observed). They are series that do not fit the usual distribution, according to Hepsag & Akçal (2019). The series in the study don't follow a normal distribution. According to Lee et al. (2015), the RALS estimator becomes more powerful when a linear model is applied in the presence of non-normally distributed errors. As a result, it is believed that the RALS cointegration test, which can correct anomalous mistakes, significantly adds to the body of literature.

The second justification stays away from the customary method of predicting a specific functional form using RALS cointegration tests. In RALS-based tests, non-normally distributed mistakes are used as input, and the RALS process deviates from the intended functional form, which could result in power loss.

The third and last justification is that, when the information about non-normal distributions received from the error terms is minimal, the power of RALS-based tests converges to the explanatory power of other cointegration tests. Contrarily, when non-normal distribution characteristics are identified during the estimation process, the employment of RALS-based tests boosts the test's explanatory power because of its non-normal distribution properties. The RALS cointegration tests Lee et al. (2015) created are more effective in non-normal distributions than their counterparts.

According to Lee et al. (2015), the RALS cointegration test took into account four separate test regressions. The regressions from the RALS ADL test were used among these test regressions.

$$\Delta y_t = d_t + \delta_1 y_{t-1} + \gamma' x_{t-1} + \phi' \Delta x_t + u_t \quad (1)$$

The equation in the notation (1) is called ADL. In this equation, d_t shows the components that express the constant term or deterministic trend. Co-integration tests based on the RALS method were developed by Lee et al. (2015) in case the error terms in the above test regression did not conform to the normal distribution.

In the RALS cointegration tests suggested by Lee et al. (2015), critical values of these test regressions were produced by considering the ADL test regressions. Accordingly, the RALS-ADL test regression was defined as follows.

$$\Delta y_t = d_t + \delta_1 y_{t-1} + \gamma' x_{t-1} + \phi' \Delta x_t + \theta_2 \hat{w}_{2t} + \theta_3 \hat{w}_{3t} + v_t \quad (2)$$

After estimating the RALS-ADL test regressions (2) with Least Squares (Least Squares), $\delta_1 = 0$ is the null hypothesis that there is no cointegration relationship and $\delta_1 < 0$ show that the existence of a cointegration relationship. In order to carry out this test, test statistics can be obtained as shown below.

$$\tau^*_{ADL} \rightarrow \rho \tau_{ADL} + \sqrt{1-\rho^2}\, Z \quad (3)$$

In equation (3), τ_{ADL} is the test statistics obtained from the traditional test regressions (1) and $\rho = corr(\hat{v}_t, \hat{u}_t)$ $\hat{v}_t$ and $\hat{u}_t$ are the long-term correlation coefficient of the residuals, and Z represents a random variable with a zero mean and constant variance.

4. Empirical Findings

Before starting the analysis, a few steps were taken. First, the series' descriptive statistics were gathered. After that, the series' stationarity was established.

Table 3. Descriptive Statistics

	lnfood	lnoil	lndollar	lncpi
Mean	2.389140	1.803375	0.398757	2.355509
Median	2.345060	1.814980	0.256450	2.327195
Maximum	3.144098	2.146128	1.262011	3.019901
Minimum	1.970486	1.275081	0.068348	1.976671
Std. Dev.	0.281368	0.162353	0.302731	0.242841
Skewness	0.593006	-0.427048	1.058239	0.571170
Kurtosis	2.740455	2.770116	3.109377	2.753332
Jarque-Bera	14.55563	7.725480	44.35298	13.48714
Probability	0.000691	0.021010	0.000000	0.001178
Sum	566.2261	427.3999	94.50541	558.2555
Sum Sq. Dev.	18.68367	6.220572	21.62853	13.91738
Observations	237	237	237	237

Descriptive statistics show that the series do not follow a normal distribution. In this situation, the analysis of series without a normal distribution was done using the more powerful RALS ADL method. Table 4 displays the series' unit root statistics.

Table 4. ADF and PP Unit Root Test Results

		Level		**First differiences**		
		ADF				
		Test ist.	**Prob**	**Test ist.**	**Prob**	**Decision**
		ADF	**PP**	**ADF**	**PP**	
Constant	**food**	2.597 (1000)	3.158 (1000)	-10.19 (0.000)	-10.24 (0.000)	I(1)
	oil	-3.077 (0.029)	-2.810 (0.058)	-12.67 (0.000)	-12.44 (0.000)	I(1)
	dollar	3.426 (1000)	3.805 (1000)	-10.70 (0.000)	-9.896 (0.000)	I(1)
	cpi	2.597 (1.000)	3.158 (1.000)	-10.19 (0.000)	-10.24 (0.000)	I(1)
Constant and trend	**food**	0.728 (0.999)	1.645 (1000)	-10.60 (0.000)	-10.60 (0.000)	I(1)
	oil	-3.057 (0.119)	-2.779 (0.206)	-12.65 (0.000)	-12.41 (0.000)	I(1)
	dollar	-0.239 (0.991)	-0.113 (0.994)	-11.73 (0.000)	-10.15 (0.000)	I(1)
	cpi	0.7287 (0.999)	1.645 (1.000)	-7.113 (0.000)	-10.60 (0.000)	I(1)

ADF and PP tests were used to look at the series' stationarities. When the initial difference is taken, all series (with the exception of the oil series) become stationary. To put it another way, the series are I (1). Only in the fixed model is the oil series stationary at the level value determined by the ADF test. It is believed that accepting this series as I would be more accurate given that it is stationary in the first difference in other models and testing (1).

Table 5. Cointegration test results

	Test statistic	p^2
ADL	-5.966377	**-**
RALS-ADL	-6.744902	**0.91**

Note: The critical values of the RALS-ADL test are –4.349, –3.686, –3.333 in 1%, 5% and 10% significance levels, respectively.

According to the Johansen cointegration test and the RALS-ADL test, the findings obtained demonstrate a cointegration relationship; this association is stronger in series without a normal distribution. Table 6 lists the results of the long-term model that was used to estimate the extent of the current long-term relationship.

Table 6. Long-Term Model Estimation Results

	DOLS	FMOLS	Canonic
lndollar	-0.026 (0.376)	0.001 (0.954)	0.0006 (0.978)
lnoil	-0.038 (0.014)	-0.026 (0.034)	-0.026 (0.036)
lncpi	1.187 (0.000)	1.157 (0.000)	1.158 (0.000)
C	-0.330(0.000)	-0.291(0.000)	-0.292(0.000)

Note: Values in parentheses indicate probability values.

In the study, DOLS, FOLS and Canonic cointegration tests were used to obtain long-term coefficients. Although the applied tests yielded consistent results, FMOLS and Canonik test results are much closer to each other. In this context, FMOLS results have been interpreted because FMOLS technique is more powerful than others and has similar results with Canonik technique. According to this, although the lndolar variable is in a positive sign, it is not statistically significant. The oil variable has a negative sign and a 1-unit increase will cause a 0.03% decrease in food prices. Therefore, there is a relationship in the opposite direction of expectations. Due to the Russia-Ukraine war, western countries such as the EU and the USA imposed sanctions on Russia. Türkiye, on the other hand, implemented a balanced policy between Russia and Ukraine, as a result of which Russian oil was sold below the market price to Türkiye as well as to countries such as China and India. The opposite sign of expectations may be this result. At the same time, there are studies in the literature that support this finding. In the study of Chen et al. (2020), it is seen that there is an inverse relationship between food prices and oil prices in developed countries. A 1-unit increase in the statistically significant CPI index contributes to an increase of 1.16% in food prices. According to this finding, increases in CPI seem to lead to price increases in both the current and future periods. Because the fact that companies and households have price increase expectations causes them to bring future expenditures forward, which triggers price increases and causes what is called the inflation spiral. It explains the situation in Türkiye recently. The result obtained in this respect is remarkable.

5.Conclusion

Oil is a basic energy source. Hence, it acts as input for industrial and agricultural production. The global oil market was exposed to various price shocks during the said analysis period (January 2003- September 2022). Decline in oil prices in the second quarter of 2013; It took the form of an increase in oil prices with the Russia-Ukraine war. Fluctuations in oil prices affect food prices (Chen et al., 2020). Leading studies reveal the claim that oil prices move together with food prices at the global and national level. Recently, the joint action debate has been criticized based on the idea that economic structure and uncertain economic events significantly affect the behavior of both markets. In this context, we revisit the discussion using a different approach. In the study, Lee et al. (2015), RALS ADL cointegration technique was used, which provides strong results in series that do not have normal distribution. Accordingly, there is a cointegration relationship between the series. In line with the finding of a long-term relationship, long-term coefficients were obtained by DOLS, FMOLS, and Canonik techniques. Although the applied tests gave similar results, FMOLS and Canonik test results are much closer to each other. In this context, FMOLS results have been interpreted because FMOLS technique is more powerful than others and has similar results with Canonik technique. Accordingly, although the lndolar variable has a positive sign, it is not statistically significant. Oil price has an adverse explanatory power on food prices. Moreover, the study reveals that the CPI can significantly predict the current and future values of food prices. Our findings show that oil price does not always move with food prices and vice versa.

In studies conducted in the sample of Türkiye (Altıntaş (2016), Çınar & Hushmat (2016), Utkulu & Ekinci (2016), Damba, Bilgiç & Aksoy (2017), Alper (2018), Karadaş & Koşaroğlu (2020), Akçağlayan (2021), Algan et al. (2021), Gökçe (2021), Güngör & Erer (2022)) there is a positive relationship between oil prices and food prices. Unlike both theoretical expectations and empirical literature, there is an inverse relationship to expectations in the current study. There are studies in the literature that support this finding. Chen et al. (2020) found an inverse relationship between food prices and oil prices in developed countries; on the other hand, Reboredo (2012) did not find any relationship between oil and food prices.

In line with the findings, some suggestions can be made to policy makers and researchers. On the supply side, supporting contract farming, which has been mentioned recently, will increase food adequacy and food stock balance, especially in times of crisis. On the demand side, the preference for locally produced foodstuffs can alleviate the over-reliance on food imports, which often worsens the food price situation in the country, and may put pressure on the country. From this point of view, while the current study examines the relationship between oil prices and food prices in Türkiye, future studies can compare oil-exporting and oil-importing countries in terms of food price-oil price connection. Whether this situation differs in terms of oil-buying and selling countries will provide important implications. It is thought that it would be beneficial to use techniques that take into account the asymmetric effect in these studies.

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