

Effects of the Russian–Ukrainian war on the value of imports and the food trade balance in Saudi Arabia

Russian–
Ukrainian war
effects in Saudi
Arabia

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Abstract

Purpose – This study aimed to measure the effects of the Russian–Ukrainian war on the value of imports and the food trade balance in Saudi Arabia.

Design/methodology/approach – Estimating the suggested model using econometric analysis for the years 1990–2021.

Findings – The amount of deficit increased in the food trade balance from 11.58 billion riyals in 1990 to 72.98 billion riyals in 2021. As for the increase in the index of food production by 10%, it leads to a decrease in the value of food imports for Saudi Arabia by 1.88%. Also, the value of the deficit in Saudi Arabia's food trade balance decreases by 5.24% as a result of a 10% rise in food exports to the country.

Originality/value – In light of the increase in the food price index to 145.8, the value of food imports and the deficit in the food trade balance exceed their counterparts in the current situation for the year 2021, at a rate of 37.1% and 44.5% for each respectively. In view of achieving huge financial surpluses as a result of the rise in oil prices, the Saudi Arabia is able to bear the high import bill and the amount of food trade balance deficit. Finally, the Russian–Ukrainian war leads to an increase in the cost of obtaining food commodities and their unavailability in the markets and thus affects the food security environment. Therefore, this study recommends the necessity of conducting more studies on the impact of the war on the food security of the Kingdom of Saudi Arabia.

Keywords Russian–Ukrainian war, Food exports and imports, Food trade balance, Saudi Arabia

Paper type Research paper

Introduction

The Russian–Ukrainian war caused several negative effects. Its impact does not stop on the states of the Russian Federation and Ukraine. Rather, its impact extends to the global system, especially countries that have interests and partnerships with the warring countries. Since the outbreak of the Russian–Ukrainian war, the FAO Food Price Index has increased from 135.6 in January 2022 to 159.7 in March 2022, then declining to reach 135.9

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in October 2022 (Index, 2022). It is expected that the global food import bill will reach \$1.94 trillion in 2022, an increase of 10% over its counterpart in 2021. This is due to the rise in global food prices and the depreciation of currencies compared to the US dollar. Both affect the purchasing power of the importing countries and thus the amount of food imported. Low-income countries are more affected by higher prices, as their imports are expected to decrease by 10%, which indicates a growing problem with access to food for these countries (Index, 2022).

It is also expected that the global import bill for inputs will increase to reach \$424 billion in 2022, by 48% over its counterpart in 2021. This is due to the high costs of imported energy and fertilizers, forcing some countries to reduce the use of inputs, which leads to lower agricultural production and the reduction availability of local food, thus reducing the period of adequacy of food production for local consumption (Index, 2022). There is no doubt that the rise in the prices of imported food commodities leads to a rise in the import bill and an increase in the deficit in the food trade balance of the net food importing countries.

Abdel-Qader and Rashad (2022) study dealt with the expected effects of the Russian–Ukrainian war on the Egyptian economy. It showed that the war will have several negative effects in the field of food, energy and tourism, in addition to an increase in the deficit in the state's general budget and trade balance, currency depreciation, high inflation rates and cost of living.

Ben Hassen, and El Bilali (2022) explained that the food crisis has worsened in countries that depend on food imports, such as the countries of the Middle East and North Africa. Ukrainian exports stopped, due to the Russian–Ukrainian war. There was also a shortage of agricultural labor and rising costs of chemical fertilizers, leading to a shortage in the global supply of grains and higher global prices for foodstuffs. Finally, this study recommended promoting environmentally sustainable food systems through the adoption of urgent and long-term policies.

The 2022 indicated that the Russian–Ukrainian war, in light of the Corona virus pandemic, led to a slowdown in the global economy and an increase in inflation rates. It is projected that the global growth rate will decrease from 5.7% in 2021 to 2.9% in 2022. As for the Kingdom of Saudi Arabia, the growth rate in GDP is expected to increase from 3.2% in 2021 to 7.0% in 2022. The Russian–Ukrainian war also disrupted activity, economic, investment and trade in the short run. Due to damage caused by the pandemic and the war, the per capita income level in developing economies remained around 5% before this period.

Sohag, Islam, Tomas Žiković, and Mansour (2023) examined the extent to which food prices respond to geopolitical risk events in Eastern and Western Europe. This study showed that aggregate measures of geopolitical risk reduce food prices in the short run in Eastern Europe but increased food prices in Western Europe. In light of the political effects for Eastern and Western Europe, this study recommended the need to take concrete and joint political measures to address the harmful effects of geopolitical risks to achieve stability in food markets.

Hani (2022) showed that despite the outbreak of war between the two sides of the conflict, its results were transmitted to the rest of the world through energy markets, basic materials and the policy of uncertainty. In light of the results of the Russian–Ukrainian war, there are several lessons learned, the most important of which are the following: (1) Russia was able to continue to challenge the Western world through the use of energy weapons (natural gas and oil), as the economic factor gave it strength to overcome sanctions, (2) focus on the principle of diversification in export and import to ensure a more solid economy and not be quickly affected by shocks and crises, (3) the war led to a rise in the prices of basic commodities, the most important of which are grains, which made many countries face problems in meeting

their needs for grains that were imported from Russia and Ukraine and thus became necessary to think about improving and increasing local production instead of relying on imports.

Jagtap *et al.* (2022) examined the impact of the Russian–Ukrainian conflict on global food supply chains, especially in the following areas: (a) food production, processing and storage, (b) food transportation logistics, (c) food markets (retail), (d) consumers, (e) food-dependent services and (f) food quality. It was found from this study that the most affected economies were located in Europe and Africa. In light of the continuation of the Russian–Ukrainian war, it is necessary to find alternatives to food supply chains in North and South America, the Middle East, Australia and some regions of Asia and Africa. This study recommended the need to develop strategies for global food supply chains to face potential crises and wars.

And it was found from Albadry and Abdelmoneim (2022) that food security represents an obsession for decision-making circles in the Arab world in light of the current conditions, and the changes the world is witnessing that require a rearrangement of papers and consideration of current and future policies to include the concept of food security in security strategies as one of the components of national security which is no less important than all components of national security, supporting scientific research in the field of food production, preparing future studies to keep pace with scientific development to enhance the role of technology in achieving food security and training human cadres working in the field of agriculture and food production to use the latest methods and mechanisms in the production process.

Leal Filho, Platje, Eustachio, and Hunt (2023), also showed a direct impact on Europe and global supply chains, especially food trade, the most important of which is grains. The amount of Russian and Ukrainian exports represents about 30% of global wheat exports. The shortage in the supply of food commodities led to an increase in prices in global food markets. The lack of exports due to the war and trade restrictions with Russia have led to negative consequences for the food security of many countries in Africa.

Toygar and Yildirim (2023) studied the impact of the Russian–Ukrainian war on global supply chains. It was found from this study that the crisis caused great losses in lives and assets, environmental, social and cultural changes and major disruptions in the global supply chains of food and energy. Logistics costs, such as international transportation and stocks, have also increased.

Finally, Yatsiv, Fediv, Yatsiv, Fediv, and Miller (2023) focused on the negative effects of the Russian–Ukrainian war, including the risks of famine in some countries in the Middle East and Africa, the cessation of Ukrainian grain exports and an increase in food prices. The Tripartite Grain Agreement, which lifts the ban on Ukraine's ports and allows the resumption of grain exports, is important but does not compensate for the significant reduction in Ukraine's export capacity in the face of global shortages.

By comparing this study with previous studies, it is clear that it is distinguished from previous studies in that it measures the impact of the Russian–Ukrainian war on the value of imports and the deficit in the trade balance by estimating an econometric model instead of the descriptive methodology included in previous studies.

Objectives

The research intended to estimate the effects of the Russian–Ukrainian war on the value of imports and the food trade balance in Saudi Arabia, through the following:

- (1) The existing situation of Saudi foreign trade for food products during the period 2000–2021.

- (2) Studying the difference between the average food price index before and during the Russian–Ukrainian war.
- (3) Assessing the planned model to study the influence of the Russian–Ukrainian war on the value of imports and the deficit in the food trade balance during the period 2000–2021.
- (4) Forecasting the value of food imports and the amount of deficit in the food trade balance of the Kingdom of Saudi Arabia in light of the expected scenarios for the rise in international prices of food products.

Materials and methods

This study used secondary data from the World Bank and Food and Agricultural Organization (FAOSTAT) websites to accomplish its goals and the annual statistical book from the General Authority for Statistics, in addition to the annual statistics from the Saudi Central Bank. This study used the econometric analysis represented in the following to accomplish its goals.

- (1) The (t) test to identify the significant difference between the mean of the index of food prices before and during the Russian–Ukrainian war. The value of (t) was calculated through the following equation (William, 2003):

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sigma \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$\sigma^2 = \frac{(n_1 - 1)\sigma_1^2 + (n_2 - 1)\sigma_2^2}{n_1 + n_2 - 2}$$

- (2) The anticipated model to study the effect of the Russian–Ukrainian war on the value of imports and the deficit in the food trade balance of the Kingdom of Saudi Arabia consists of the following equations:

$$Y_1 = a_0 + a_1X_1 + a_2X_2 + a_3X_3 + e_1$$

$$Y_2 = b_0 + b_1X_4 + b_2\hat{Y}_1 + e_2$$

The following variables are included in the suggested model: (a) internal variables, which are two variables: the cost of food imports in million dollars (Y_1) the value of food trade balance deficit in million dollars (Y_2), (b) the exogenous variables, which are four variables: The index of world food prices (X_1), the index of food production in the Kingdom of Saudi Arabia (X_2), the index of the real exchange rate of the local currency (X_3), the value of food exports in million dollars (X_4). The matrix of internal variables has a diameter of one, and any numbers above this diameter take the value zero; hence, the ordinary least squares approach was used to estimate the suggested model as follows (Gujarati & Porter, 2009):

External variables				Internal variables	
X_4	X_3	X_2	X_1	Y_2	Y_1
0	$-a_3$	$-a_2$	$-a_1$	0	1
$-b_1$	0	0	0	1	$-b_2$

The proposed model is characterized by measuring the impact of the Russian–Ukrainian war on the value of food imports and the deficit in the food trade balance in an econometric way. Due to the dependence of the model used on time series data, several problems may appear in the behavioral equations of the model, the most important of which is the autocorrelation of the residuals that lose the efficiency of the estimated parameters. Also, the presence of autocorrelation leads to small standard errors of the estimated parameters and then raises their significance and inaccurate confidence intervals, and therefore, it is necessary to get rid of them.

The problem of autocorrelation is detected using several tests, the most important of which are:

- (1) Durbin–Watson test with a value between zero and four ($0 \leq DW \leq 4$). By comparing the calculated DW value with the minimum and maximum tabular DW value, the presence or absence of autocorrelation is determined according to the following table:

Statement	Calculated DW value	Decision
1	$(4-d_l) \leq DW \leq 4$	Negative autocorrelation
2	$(4-d_u) \leq DW \leq (4-d_l)$	Not determined
3	$2 \leq DW \leq (4-d_u)$	No autocorrelation
4	$d_u \leq DW \leq 2$	No autocorrelation
5	$d_l \leq DW \leq d_u$	Not determined
6	$0 \leq DW \leq d_l$	Positive autocorrelation

Breusch–Godfrey Serial Correlation LM test. The EViews statistical program allows detection of the problem of autocorrelation by comparing the probability value (*p*-value) and the level of significance (α), if the probability value is greater than the level of significance, this indicates that there is no autocorrelation between the random errors, but if the probability value is less than the significance level, this indicates that there is an autocorrelation between the random errors. The problem of autocorrelation is eliminated in several ways, the most important of which are: (1) Generalized Least Squares Method, (2) Generalized Difference Method. These two methods depend on calculating the value of the autocorrelation coefficient (ρ) (Ismail, 2001).

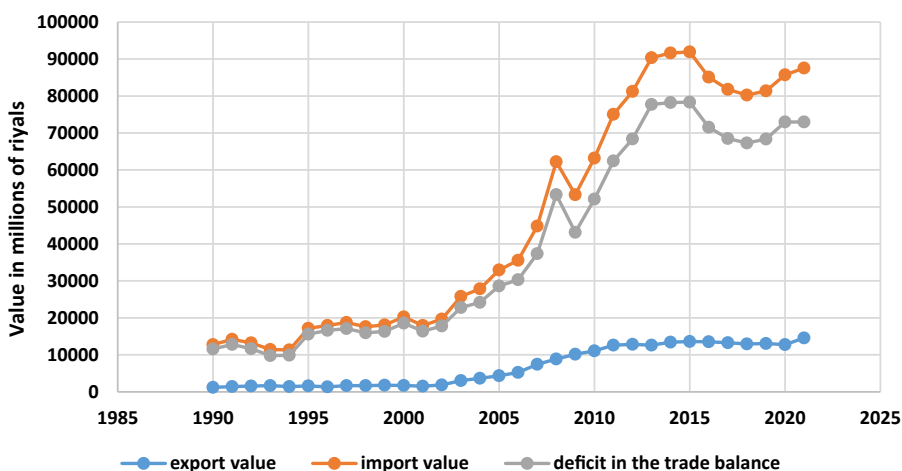
Results and discussion

The current situation of Saudi foreign trade for food products during the period 2000–2021

The Kingdom of Saudi Arabia imports and exports live animals, products made from plants and animals, fats and oils from vegetables and animals, items for the food and beverage industries, alcoholic beverages, vinegar and tobacco. By examining the development of Saudi foreign trade for food products during the period 1990–2021, it is clear from Figure 1 and Table 1 that:

- (1) Food exports increased in value from 1.18 billion riyals in 1990, which represented 0.71% of the total Saudi exports, to 14.55 billion riyals in 2021, which represents 1.4% of all Saudi exports. The value of food exports increased at an annual growth rate of 9.9%, while it increased the total value of Saudi exports at an annual growth rate of 7.5%, and then the ratio of the value of food exports to the total value of Saudi exports increased at an annual growth rate of 2.4% during the study period.

Figure 1.
The evolution of the value of exports and imports and the amount of the deficit in the food trade balance during the period 1990–2021



Source(s): Figure by authors

Variable	Yearly growth %	F	R ²	Equation
value of food exports	9.9	259.2	0.89	$LnY_1 = 6.787 + 0.099X(58.21)^{**} (16.10)^{**}$
Total value of exports	7.5	100.78	0.77	$LnY_2 = 11.839 + 0.075X(83.80)^{**} (10.04)^{**}$
Percentage of the value of food exports %	2.4	22.95	0.43	$LnY_3 = -0.446 + 0.024X(-4.66)^{**} (4.79)^{**}$
value of food imports	7.9	364.16	0.92	$LnY_4 = 9.186 + 0.079X(117.82)^{**} (19.08)^{**}$
The total value of imports	7.6	216.77	0.88	$LnY_5 = 11.140 + 0.076X(114.53)^{**} (14.72)^{**}$
Percentage of food import value %	0.3	1.71	0.05	$LnY_6 = 2.650 + 0.003X(60.62)^{**} (1.31)^{ns}$
Deficit in the food trade balance	7.6	359.73	0.92	$LnY_7 = 9.092 + 0.076X(120.41)^{**} (18.97)^{**}$
The rate of coverage of food imports by exports	2.0	34.87	0.54	$LnY_8 = 2.206 + 0.020X(33.46)^{**} (5.91)^{**}$

Table 1.
Equations relating to the general pattern of exports, imports and the food trade balance from 1990 to 2021

Note(s): ** Significant at the 1% level, ns not significant
Source(s): Data presented in Figure 1

- (2) The value of food imports also increased from 12.76 billion riyals, representing 14.1% of the total value of Saudi imports in 1990, to 87.53 billion riyals, representing 15.3% of the total value of Saudi imports in 2021. During the research period, the value of food imports rose at an annual growth rate of 7.9% while the value of all Saudi imports rose at an annual growth rate of 7.6%.
- (3) Due to the superiority of the value of imports over the value of food exports during the study period, the deficit in the food trade balance increased from 11.58 billion riyals in 1990 to 72.98 billion riyals in 2021. The food trade balance deficit reached 7.6% annual growth rate. The rate of export coverage of food imports also increased from 9.26% in 1990 to 16.62% in 2021, i.e. the rate of export coverage of food imports increased at an annual growth rate of 2.0% through the study period.

Studying the average food price index before and during the Russian-Ukrainian war

By examining the difference between the average food price index before and in the Russian-Ukrainian war, it is clear from the data in Figures 2 and 3 and Table 2 that:

- (1) The average food price index increased from 126.5 during the period January 2021–January 2022, to 146.9 during the period February 2022–October 2022, i.e. the average food price index increased after the Russian-Ukrainian war at a rate of 16.14%. At the level of commodity groups, the rate of increase in the average index during the Russian-Ukrainian war ranged between a minimum of 4.39% for sugar and a maximum of 20.31% for dairy products.

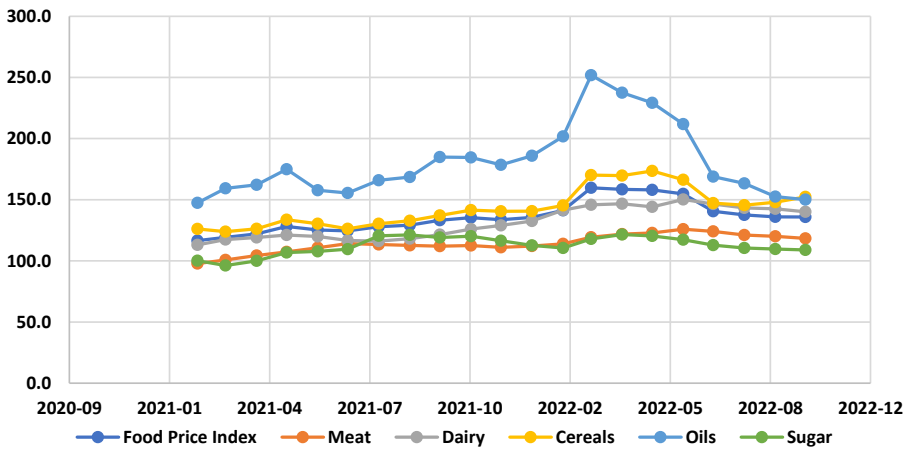


Figure 2. The evolution of the food price index of the Food and Agriculture Organization during the period January 2021–October 2022

Source(s): Food and Agriculture Organization (2022). FAO Food Price Index, Issued November 4

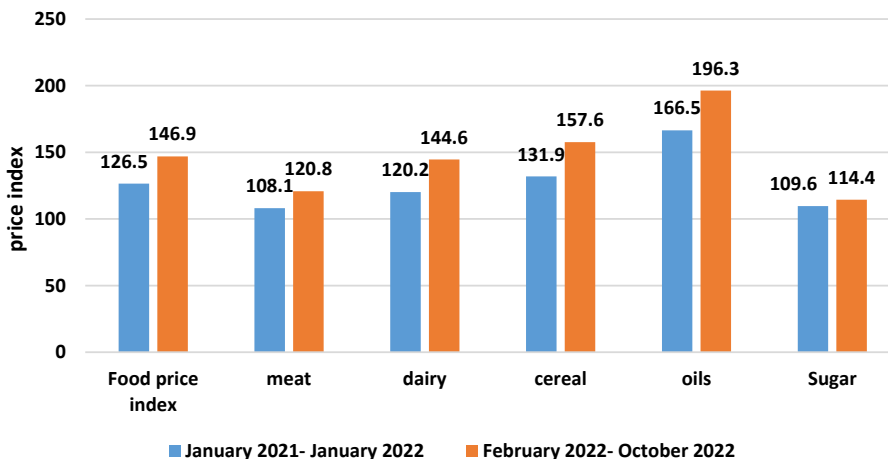


Figure 3. Average global food price index before and during the Russian-Ukrainian war

Source(s): Data presented in Figure (1)

- (2) By studying the significance of the difference between the averages of the food price index before and during the Russian–Ukrainian war, it turns out that the calculated (*t*) value is greater than its tabular counterpart of 2.528 at the 1% probability level and 20 degrees of freedom for each of the price index of meat, dairy products, grains and food vegetable oils. From the foregoing, it is clear that the Russian–Ukrainian war led to a significant increase in the prices of meat, dairy products, grains and dietary vegetable oils, while the increase was insignificant in the prices of sugar.

Estimating the suggested model to analyze the effect of the Russian–Ukrainian conflict on the value of imports and the size of the trade deficit in food

The suggested model was estimated to show the effect of the Russian–Ukrainian war on the value of imports and the amount of deficit in the food trade status in Saudi Arabia during 1990–2021, using step-wise multiple regression analysis in linear, logarithmic and semi-logarithmic form (William, 2003), showing the preference of the following estimated equations:

$$\text{Ln}\hat{Y}_1 = 8.185 + 0.698\text{Ln}X_1 - 0.188\text{Ln}X_2 + 0.987 AR \quad (1)$$

(3.49)** (3.89)** (-2.46)** (22.46)**

$$R^2 = 0.97, F = 277.07, D.W = 1.76, Arch\ test = 2.23$$

$$\text{Ln}\hat{Y}_2 = 6.672 + 0.787\text{Ln}\hat{Y}_1 - 0.524\text{Ln}X_4 + 0.712 AR \quad (2)$$

(2.84)** (3.067)** (5.54)** (5.19)**

$$R^2 = 0.98, F = 281.60, D.W = 1.58, Arch\ test = 0.19$$

** significance at 1% level.

The following is evident from the estimated model:

- (1) Food price index in the world increased (X_1) by 10% raised the value of food imports of the Kingdom of Saudi Arabia by 6.98%, while it was found that an increase in the local food production index, expressed by the food production index (X_2) by 10%, leads to a decrease in the value of food imports to the Kingdom of Saudi Arabia by 1.88%.
- (2) The estimated value of food imports rising (\hat{Y}_1) by 10% raised the food trade balance deficit value by 7.87%, while it was found that the Saudi food exports value raised (X_4) by 10%, may reduce the deficit in the food trade balance in Saudi Arabia by 5.24%.

Commodity group	Average food price index		σ^2		<i>t</i> -test
	January 2021- January 2022	February 2022- October 2022	January 2021- January 2022	February 2022- October 2022	
Food price index	126.5	146.9	51.2	110.3	5.44
Meat	108.1	120.8	39.5	12.4	5.50
Dairy products	120.2	144.6	36.6	9.4	11.09
Cereal	131.9	157.6	40.6	144.7	6.53
Vegetable oils	166.5	196.3	221.1	1503.0	2.54
Sugar	109.6	114.4	93.5	24.0	1.37

Note(s): ** Significant at 1%, * Significant at 5%

Source(s): Data presented in Figures 2 and 3

Table 2.
T-test for the significance of the difference between the mean food price indices before and during the Russian–Ukrainian war

- (3) The behavioral equations of the suggested model without autocorrelation problem of residuals, the D.W test result showed no autocorrelation in series variation, Also the Arch test result. The behavioral equations in the suggested model efficiently representing the data used in the estimation, as the indicators measuring the efficiency of the model, including the inequality coefficient for U-Theil, whose value is close to zero (Table 3).

Forecasting the value of food imports and the amount of deficit in the food trade balance in light of the expected scenarios for the rise in international prices of food products

The value of food imports and the amount of deficit in the food trade balance in Saudi Arabia were predicted with different scenarios in rising in international prices of food products. The data in Table 4 shows the following:

- (1) An increase in the food price index to 145.8 (the average global food price index during the period January 2022–October 2022), with the value of food exports and the food production index remaining stable at the level of 160.1 for the year 2021. The food production index was stable, although Saudi Arabia has a problem with water, and it is in the process of collecting water to apply the Middle East Green Initiative. In the short term, the state cannot expand plant and animal production (Ghanem & Alamri, 2023). In light of the proposed model, the value of food imports amounts to 120.0 billion riyals, which is 37.1% more than its counterpart in the current situation for the year 2021. In light of the stability of the value of food exports, the deficit in the food trade balance amounts to 105.46 billion riyals, which is 44.5% more than the current situation in 2021.
- (2) Increasing the food price index to 145.8 in 2022, with a forecast of the value of food exports amounting to 23.25 billion riyals according to the general trend formula presented in Table 1, in addition to predicting the food production index of 131.4 in 2022. In light of the proposed model, the value of food imports amounts to 124.55 billion riyals, which is more than its counterpart in the current situation for the year 2021, at a rate of 51.2%. In light of the prediction of the value of food exports amounting to 23.25 billion riyals, the deficit in the food trade balance amounts to 101.3 billion riyals, which is more than its counterpart in the current situation for the year 2021 at a rate of 49.5%.
- (3) In light of the prediction of the food exports and imports valued extracted from the general trend equations, the value of exports, imports and the deficit in the food trade balance amounted to 23.25, 132.32 and 109.07 billion riyals, respectively. The value of imports and the deficit in the food trade balance exceed their counterparts in the current situation at a rate of 51.2% and 49.5% each, respectively (Table 4).

Index	The first equation	The second equation
Root mean squared error	0.958	0.155
Mean absolute error	0.809	0.124
Mean absolute percent error	7.384	1.216
Theil inequality coefficient	0.047	0.007

Source(s): Equations of the model estimated in this study

Table 3.
Indicators for
measuring the
efficiency of the
estimated model
equations from 1990
to 2021

Table 4. Forecasting the value of imports and the amount of deficit in the food trade balance in light of the expected scenarios for the rise in international prices of food products

Scenario	Food exports value in million riyals	Food imports value in million riyals	Deficit in the food trade balance in millions of riyals	The rate of increase from the current situation %	
				Value of food imports	Food trade deficit
The status quo in 2021	14547	87529	72982	–	–
Increasing the food price index to 145.8 in 2022, with the value of exports remaining constant and the food production index at the level of 160.1 for the year 2021	14547	120012.4	105465.4	37.1	44.5
Increasing the food price index to 145.8 in 2022, with a prediction of the value of food exports and the food production index for the year 2022	23248.6	124553.5	101304.9	42.3	38.8
Forecasting the value of food exports and imports according to the general trend equations estimated in this study	23248.6	132322.8	109074.4	51.2	49.5

Source(s): The expected scenarios and the model proposed in this study

Conclusion

The Russian–Ukrainian war began on February 24, 2022, following pandemic disease, causing several negative effects on the World economics. Since the outbreak of the war, the food price index raised from 135.6 in January 2022 to 159.7 in March 2022, then it decreased until it reached 135.9 in October 2022. By examining the significance of the difference between the average food price index before and after the Russian–Ukrainian war, it becomes clear There is a significant difference at the probability level 1% for meat, dairy products, grains and vegetable oils.

Given the scarcity of water and the instability of rain rates on the sedimentary shelf areas in the Kingdom of Saudi Arabia, it depends on the outside to meet the domestic consumption needs and thus falls within the net importing countries of food. As a result of the Russian–Ukrainian war, import prices of food commodities increased and thus the value of food imports increased. In light of the modest value of food exports and their confinement to commodities that do not deplete water, the crisis led to an increase in the value of the food trade balance deficit.

There is no doubt that the rise in import prices of food commodities leads to a rise in the import bill and an increase in the deficit in the food trade balance of net food importing countries, including Saudi Arabia. And due to the superiority of the value of imports over that of food exports during the period 1990–2021, the deficit in the food trade balance of the Saudi Arabia increased from 11.58 billion riyals in 1990 to 72.98 billion riyals in 2021, i.e. the deficit in the food trade balance increased at an annual growth rate of 7.6%.

Through the proposed model to study the impact of the Russian–Ukrainian war on the value of imports and the amount of deficit in the food trade balance of Saudi Arabia, it was found that an increase in the global food price index by 10% leads to an increase in the value of food imports by 6.98% and thus an increase in the value of the deficit in the balance commercial food by 7.87%. On the other hand, it was found that an increase in the food

production index leads to a decrease in the value of imports, just as an increase in the value of food exports leads to a decrease in the food trade balance deficit. Although Saudi Arabia suffers from water scarcity, and it is in the stage of applying the Green Middle East initiative, it is difficult to expand all production and export, food products.

And given the unavailability of data for the year 2022, the value of food imports and the amount of deficit in the food trade balance of Saudi Arabia were predicted in light of several expected scenarios of a rise in international prices of food products. In light of the increase in the food price index to 145.8, with the value of food exports and the food production index unchanged, the value of food imports amounts to 120.0 billion riyals, i.e. 37.1% more than its counterpart in the current situation for the year 2021. It is also expected that the deficit in the food trade balance will increase to 105.46 billion riyals, which is 44.5% more than the current situation in 2021. And through the financial surpluses achieved by Saudi Arabia as a result of the rise in oil prices, it is able to bear the high import bill and the amount of food trade balance deficit.

Finally, the high import value of food commodities increases the cost of obtaining them for consumers. The Russian–Ukrainian war also obstructs the supply of food commodities and thus reduces the affordability and availability of food commodities in the markets, thus affecting the food security environment. In light of the results of this study, it recommends that more studies should be conducted on the impact of the Russian–Ukrainian war on the food security of the Kingdom of Saudi Arabia.

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