AN ECONOMIC STUDY FOR IRAQ'S RICE IMPORTS FOR THE PERIOD (1990-2015) and PREDICTION FOR THE PERIED (2016 – 2023)

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ABSTRACT

This research aims at predicting the imported quantities of rice in Iraq for the period 2016-2023 through the use of the self-regression model (VAR). The values of explanatory variables (local production, population, national income, local price index, of rice consumption), where the predicted values for each of these variables are estimated separately using the moving average method based on the data of the last 10 years. The research concluded that there is no difference between the actual values and the predicted values in the short term. This is the problem that emerged from the research which is the mismatch between these values. Therefore, the research recommended that the short term forecasts be adopted in the formulation of import policies, especially after the validity of the model To predict after testing the predictive power of the model.

Key words: prediction , imports, rice crop ,VAR
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دراسة اقتصادية لاستيرادات العراق من الرز للمدة (1990– 2015) والتنبؤ بها للمدة (2016– 2023)

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المستخلص

يهدف البحث الى التنبؤ بالكميات المستوردة من الرز في العراق للمدة 2016– 2023 وذلك من خلال استخدام نموذج الانحدار الذاتي VAR حيث تم التنبؤ بقيم المتغيرات التفسيرية وهي (الانتاج المحلي ،السكان ، الدخل القومي ، الرقم القياسي للسعر المحلي ، الرقم القياسي للسعر الحدودي ومتوسط نصيب الفرد من الاستهلاك من الرز) حيث تقدير القيم المتوقعة لكل من هذه المتغيرات بشكل منفصل باستخدام طريقة المتوسط المتحرك استناداً الى بيانات السنوات العشر الاخيرة . ولقد استنتج البحث عدم وجود فرق بين القيم الفعلية والقيم المتنبأ بها في الاجل القصير ، حيث تعد هذه هي المشكلة التي انطلق منها البحث وهو عدم التطابق بين هذه القيم ، ولذلك أوصى البحث بان يتم اعتماد تنبؤات الاجل القصير في رسم السياسات الاستيرادية وخصوصاً بعد ثبوت صلاحية الانموذج للتنبؤ بعد اجراء اختبارات القوة التنبؤية للأنموذج .

الكلمات المفتاحية : التنبؤ ، الاستيرادات ، محصول الرز. VAR
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INTRODUCTION

The prediction is great importance in the various sciences and fields and plays a great role in drawing the image of the unknown future and trying to plan it based on the various methods of prediction. It is possible to know the importance of prediction by achieving efficiency and effectiveness in the quantities that Iraq needs to import from rice and to know the needs of the country in the short term and to reduce the risks facing Iraq as well as to give a picture of the future direction and contribute significantly to the decision-making and anticipation of its future effects and predictive as a basis for strategic planning and be more effective in the control process and as a basis for the decision the correct administrative and show the importance of paying it in predicting the administration to look into the future and then taking precautions and road towards achieving the desired long-term goals needs him, and receive predictions lights on the road towards achieving the desired long-term goals commodity such as rice of the necessary commodities at the Iraqi consumer table . The problem of study is un knowing the accurate quantities that Iraq may needs in the future . The aim of this study is to predict the quantities that Iraq needs to import from rice in the coming years within the short term so that a suitable import policy can be drawn for an important commodity such as rice is one of the necessary commodities at the Iraqi consumer table (1). The existence of number of independent variables affecting the imported quantities of rice (local production, population, national income, local price, border price and dummy variable) and other variables may be included in the model.

MATERIALS AND METHODS

The prediction has taken several concepts and can be defined as an estimation of the unknown in relation to future events. The path of the phenomenon is examined in the future, so it is a rational attempt to estimate possible future variables by knowing the behavioral and non-behavioral variables of this phenomenon (3).

The concept of scientific predicition scientific prediction is important in any area of human life to find a means to help in making current and future decisions, and that it is not without a field of different sciences to find a way to characterize and analyze natural and abnormal phenomena and future prospects.

Predicting using the VAR model.(Vector auto regressive model)

VAR models offer a very simple way of forecasting and are closer to economic reality because their variables (internal and interpretive) interact with each other and therefore must be introduced into the economic system. Working with VAR components at the same time means that the model is shorter and contains fewer decelerations because information expands to include advance information of variables. However, the VAR model predictions are accurate under certain conditions. It is difficult to identify these conditions to avoid error. The number of parameters to be estimated and the degrees of freedom, and that many of the Lagged of the same variable lead to insignificant estimates, perhaps due to multiple linear correlation (11,15)

Types of Predictions using VAR

1. Dynamic prediction: It takes several steps starting from the first period of the forecasted sample. Predetermined values are used for the dependent variables to create an expectation of the current values. This option is only available when the estimated equation contains dynamic components.(10)

2. Static prediction: It is calculated in one step using the real and not expected values of the adopted dependent variables when available.

In this study, the error correction model was used as one of the methods of this type of expectation. The researchers will predict the values of the explanatory variables and then replace them with the estimated relationship, thus predicting the expected changes in the dependent variable. The average of the expected error is zero, and this does not necessarily mean that the expectation is equal to the realistic values of the variables, because of the error in both the expectation and reality estimates.

The importance of prediction(7) From above we note that prediction has great importance in different sciences and fields and plays a dangerous role In drawing the image of the unknown future and trying to plan it

depending on the multiple modes of prediction we can summarize the importance of predicting the following(4) points:

1- To achieve efficiency and effectiveness of the institution in flexibility with the external environment.

2 Knowledge of the needs of the institution in the short and medium term.

3. Reducing the risks facing the institution.

4 Give a picture of the institution for its future direction.

5. To contribute significantly to decision-making and to anticipate its future impact.

6. A basis for strategic planning.

7 - The basis of the administrative decision is a link between the establishment and its surroundings.

8. Establish more effective rules in the control process.

9 - To create interdependence, integration and coordination between parts of the establishment. The importance of the Prediction is that it drives the administration to look to the future, and then takes the needs for it, which makes the momentum of the establishment forward more stable and secure, and receive the forecasts highlights the way the institution to achieve goals, which helps to establish a more effective basis for the control, Predicting that the presence of the enterprise in the long run depends on the existence of a continuous demand for its goods or services. Forecasting is a link between the project and the establishment and the surrounding external conditions.

Standard prediction types

The prediction is divided into four types according to the following criteria:(14)

First: Duration

1. Ex-Post Prediction

The prediction or prediction of the values of the dependent variable in a period following the period in which the model was estimated. During this period the data are actually available for the phenomenon and these predictions are used to compare the actual data with the predicted data to validate the model

2. Ex-Ante Prediction

Which is to predict the value of the future variable on the basis of past and present data and information so that no value of this variable has been achieved.

Second: the degree of certainty

Conditional prediction: It is one of the explanatory variables on which the expectation is based on which is not known but must also be foreseen. If this prediction is achieved, the predictions of the phenomenon are realized.

2. Unconditional prediction: Prediction based on confirmed information is available on explanatory variables (6).

A review of the types of prediction can not be astrology or fiction but a set of qualitative and quantitative methods through which to assess the future of the case under study on the basis of technical and scientific, and as required time and subject.

Prediction methods

It can be noted that prediction methods are divided as follows:

First: Systematic Methods (Quantitative Methods):

These methods are based on an explicit rule on all explanatory variables that explain the behavior of the phenomenon. Based on the economic theory, all the variables that are included in the interpretation of the phenomenon are determined in the form of an estimable mathematical model, and the systematic methods are the graphical, statistical and mathematical method to reach predictions which are usually less biased and more accurate compared to the qualitative methods (2) .

Systematic (quantitative) methods are divided into two types of prediction models:

1. Causal models: This model in which the behavior of the Y variable is explained to some extent by one or more predicted variables. The most important causal models are econometric models, input and output models, simulation models and nonlinear dynamic models (5).

2. Non-causal models (time series analysis): These models are based on the historical values of variables that explain their behavior. These include Auto-regression models (AR), moving averages models, exponential models, BaJ models, general trend projections and VAR models.

Second: Qualitative (Technological) Prediction Methods: This type of method does not require data in the same manner as quantitative prediction methods. The required

inputs depend on the nature of the method used, the intuitive thinking of the researcher and his judgment, and the cumulative experience. These methods often require input from a number of trainees specially trained and knowledgeable about the problem. These methods fall into two general categories: exploratory methods and normative methods. From reservations to qualitative prediction methods, it is difficult to measure the accuracy of predictions generated by these methods. Therefore, they are used primarily to provide observations and assist observations, and to help quantitative prediction methods give a clearer picture rather than providing them with specific numerical predictions(8).

Measure the predictive force of the estimated models

After studying the variables of the import function of the rice crop for the period 1990-2015, we obtained through the results of the error correction vector model to determine the most important factors affecting the rice import function. To know the model's ability to predict, the actual values will be compared with their estimated values by the estimated model using the following table and the following figure respectively.---From table 1. and figure 1. , we can see that the estimated values via using the error correction model for rice import quantities are only far from actual values in the years (1997, 2010, 2011, and 2015), because of increased imports due to low production and water scarcity, Improved living and increased per capita income after 2003 , as well as the fact that rice is one of the most essential and most essential foodstuffs on which the Iraqi individual depends on his daily meals.

Table 1 .The estimated values of the import quantities of rice in Iraq for the period 1990 – 2015

obs	Actual	Fitted	Residual	Residual Plot
1990	5.83773	5.92901	-0.09128	
1991	6.03787	5.86405	0.17382	
1992	4.62497	4.73513	-0.11016	
1993	5.59099	5.48666	0.10433	
1994	6.78219	6.70500	0.07719	
1995	6.49979	6.41466	0.08513	
1996	6.58341	6.52252	0.06089	
1997	4.68213	4.98506	-0.30293	
1998	4.60517	4.77812	-0.17295	
1999	5.38450	5.29564	0.08885	
2000	4.83628	4.69083	0.14545	
2001	4.94164	5.01885	-0.07720	
2002	6.70808	6.68145	0.02663	
2003	6.79906	6.80681	-0.00776	
2004	6.72503	6.85769	-0.13266	
2005	6.55678	6.59999	-0.04321	
2006	6.82871	6.93991	-0.11120	
2007	6.53233	6.50970	0.02263	
2008	6.07074	5.93353	0.13721	
2009	5.56452	5.38853	0.17599	
2010	5.43372	5.21488	0.21884	
2011	4.77068	4.95772	-0.18704	
2012	6.81564	6.76314	0.05250	
2013	7.32119	7.32638	-0.00519	
2014	6.83518	6.72926	0.10593	
2015	7.16781	7.40162	-0.23381	

Source: From the researchers work based on the statistical program (Eviews 9).

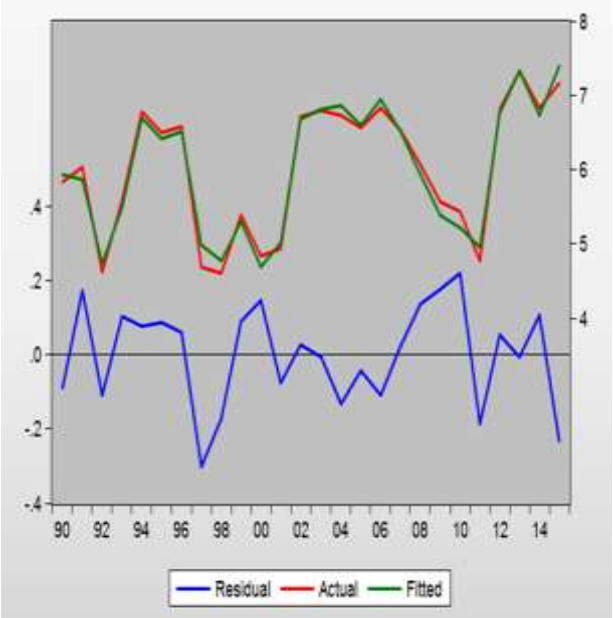

Figure 1. The comparison between the actual value curve and the estimated values of Iraq's rice import guintites for the period 1990-2015 Source: From the researchers work based on the statistical program Eviews 9.

Predicting by the vector auto regressive model (VAR)

The predicting using of the rice import function for the period 2016-2023 necessitates predicting the rice import function for the period under study to determine the direction of change in the expected values obtained from the estimated models if they have the same trend of change in the phenomenon studied in the study period. And for the purpose of judging the predictive force of static and dynamic models at the level and at variance before using it to calculate future predictions for its efficient representation of time series data. Utilization coefficient (Ut) and root Mean square error (RMSE) have been used. (Ut, RMSE) is close to zero (0.115444,0.140510) while at Ut level (RMSE), it was 0.113492,0.134397. The table 2. shows the results of the TIA and the root Mean Squared Error(RMSE) of the dynamic model (at the level) for 1990-2015.

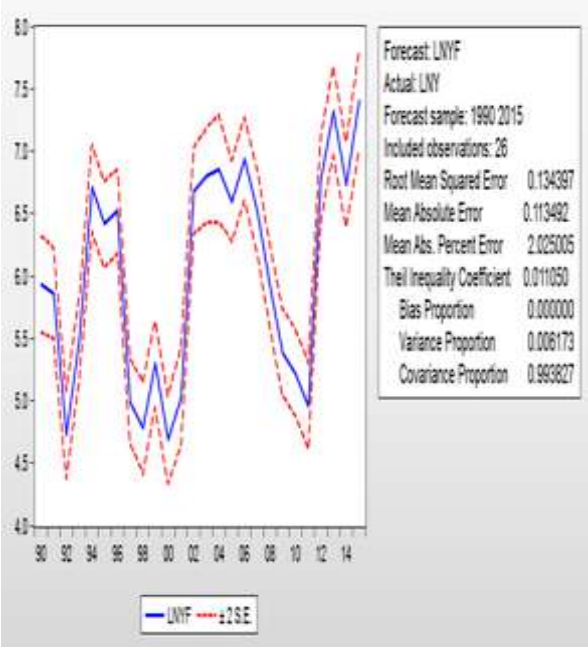

Figure 2 . the results of the test of the variance coefficients for the base and the root mean square error of the dynamic model (at the level) for the period 1990-2015

Source: From the researchers work based on the statistical program Eviews 9.

while table 3. shows the results of the TIA and the square root error of the dynamic model (at the first difference) for the period 1996-2015

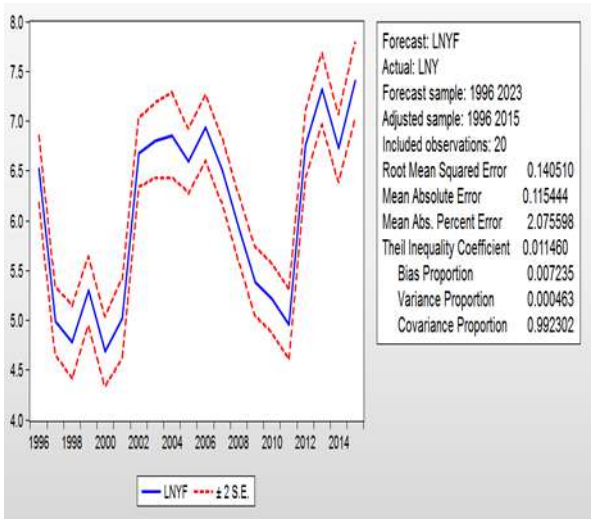

Figure 3. the results of the test of the variance coefficients for the base and the root mean square error of the dynamic model (at the first difference) for the period 1996-2015

Source: From the work of the researchers based on the statistical program Eviews .9.

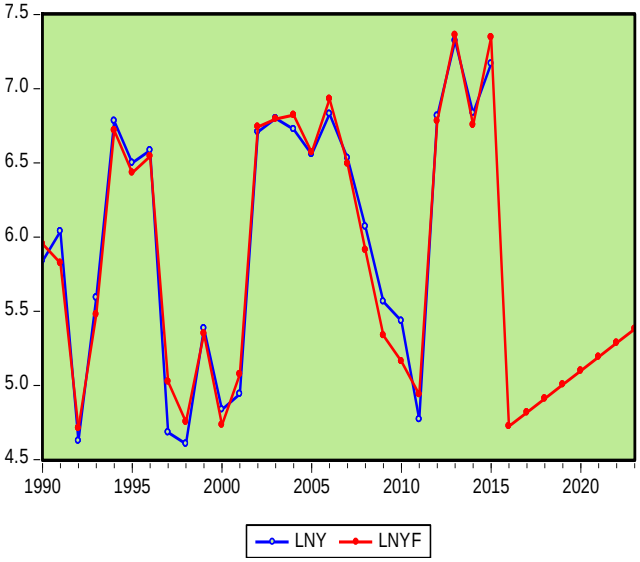

Figure 4. the temporal evolution of the actual values and predictive values of the imported quantities of rice for Iraq for the period (1990-2023).

Source: The researchers worked according to the statistical program (Eviews 9).

We can note from the figure that the estimated values are not far from the actual values during the period 1990 – 2023 except the years 1997, 2010, 2011 and 2015 , in which imports were are larger quantities than the other years under study and for the reasons mentioned earlier of the lack of local production and the increase in population and water scarcity

After selecting the model that has a high predictive capacity, it will be used to predict

the values of imported rice quantities for the period 2016-2023. Since this prediction requires predicting values of explanatory variables (local production, population, national income) . The predicted values for each of these variables have been predicted and predicted separately using the Moving Average method based on the data for the last ten years. We assume that these variables will continue to be developed in the same pattern, and then using predicted values and recalculation.--The model of error correction using predicting the dynamic model at variance and on a one-year-ahead basis. This requires recalculation of the model after expanding the sample size for an additional period. Forecasting the quantities imported from rice in 2015 was estimated for the period 1990 -2015 as the sum as the period 2023-2016 as shown in the following table , noting the actual values and predictive values for the period 1997-2023 for the imported quantities of rice as well as the predicted quantities of imports for the period 2016-2023 .

-Table 2 . the actual values and predictive values of the logarithmic formula of quantities imported in Iraq from rice for the period 1997-2023Year Actual values Predictive values

1997	4.682131	5.024615
1998	4.605170	4.754407
1999	5.384495	5.348685
2000	4.836282	4.732555
2001	4.941642	5.074724
2002	6.708084	6.741709
2003	6.799056	6.795042
2004	6.725034	6.822188
2005	6.556778	6.569594
2006	6.828712	6.929913
2007	6.532334	6.494078
2008	6.070738	5.911471
2009	5.564520	5.335858
2010	5.433722	5.161403
2011	4.770685	4.938472
2012	6.815640	6.779726
2013	7.321189	7.360814
2014	6.835185	6.754603
2015	7.167809	7.344848
2016	NA	4.724063
2017	NA	4.817650
2018	NA	4.911238
2019	NA	5.004826
2020	NA	5.098414
2021	NA	5.192001
2022	NA	5.285589
2023	NA	5.379177

Source: From the researcher's work based on the statistical program Eviews 9

The reserch conclude several conclusion such as: Because of the high predictive capacity of the model, significant convergence was found between the actual values and predicted values, indicating the possibility of adopting such a model in the conduct of predictions As well as: Predictions in the short term are more acceptable and accurate than predictions in the long run, which were conducted by researchers and showed inaccuracy.

And based on a bove conclusions, we recomund the following recommendations:

In making predictions of economic phenomena, VAR 1 has proved its accuracy in modeling models

To rely on short-term forecasts in the formulation of import policies rather than long-term forecasts.

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