Journal of the New Economy | Volume: 12 / N° 2: (2021), p132-147

The impact Oil Price on Inflation Rate in Algeria during the period 1986 – 2018

أثر سعر النفط على معدل التضخم في الجزائر خلال الفترة 1986 - 2018

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Received: 24/8/2020 Accepted: 28/12/2020 Published: 15/1/2021

Abstract:

This work aimed at evaluating the impact oil prices at inflation rate in Algeria for the period 1986-2018. It builds on the tests used and applied in modern econometrics to analyze the properties of time series in terms of stationary property and rely on standard tests that fit with these properties, as well as on the Johansen co-integration method; where after confirming the lack of a co-integration, we estimate the vector autoregressive model, Where after confirming the absence of Co-integration we estimated the vector autoregressive (VAR) model.

The estimation of the vector autoregressive model and the results obtained have shown the presence of a negative impact on the cost of oil on inflation in Algeria.

Keywords: Inflation Rate, Oil Prices, co-integration, vector autoregressive (VAR) Model, Algeria.

Jel Classification Codes: C01 , C32, E31.

ملخص:

هدفت هذه الدراسة إلى قياس أثر سعر النفط على معدل التضخم في الجزائر للفترة 1986– 2018، وتم ذلك باستخدام وتطبيق الاختبارات المتبعة في الاقتصاد القياسي الحديث والذي يبنى على اختبار خواص السلاسل الزمنية من حيث خاصية السكون والاعتماد على الاختبارات القياسية التي تتلاءم مع هذه الخواص، وكذا أسلوب التكامل المشترك لجوهانسون، حيث بعد التأكد من عدم وجود تكامل حيث بعد التأكد من عدم وجود تكامل مشترك قمنا بتقدير نموذج شعاع الانحدار الذاتي (*VAR*).

اتضح من خلال تقدير نموذج متجه الانحدار الذاتي(*VAR*) لأثر سعر النفط على معدل التضخم والنتائج المتحصل عليها وجود أثر سلبي سعر النفط على معدل التضخم في الجزائر.

كلمات مفتاحية: معدل التضخم، أسعار النفط، التكامل المشترك، نموذج متجه الانحدار الذاتي (*VAR*)، الجزائر.

تصنيف JEL : C01، E31، C32 .

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1.INTRODUCTION:

The economies of the oil-exporting nations have characterized by vibrations and shocks; vary from one state to another according to the economic data for each of these countries. The more the exports of the petroleum-exporting country concentrated on one commodity, the more economic burdens imposed on it. Algeria is a producer and exporter of oil and more sensitive to fluctuations in oil prices. Whose economy has been heavily linked to the status of the global oil market. It is also one of the countries whose economy depends heavily on the hydrocarbons sector since independence in the development process.

Its oil exports are 98%, following the transition of Algeria to the market economy; large-scale operations were carried out in a series of structural reforms in cooperation with the international financial institutions, which began in the 1980s (where the financial situation of the Algerian state deteriorated due to the large drop in oil prices in 1986 and continued until the government was forced to carry out economic reform programs in agreement with the International Monetary Fund and the World Bank in the nineties in order to correct the internal and external imbalances of the Algerian economy).

This study seeks to measure the impact of oil prices on the inflation rate in Algeria during the period (1986-2018).

In light of the previous presentation, we highlight the problematic aspects of this study, which can be framed in the following question:

The Problem of the Study

How much did the impact of oil prices on the inflation **in Algeria during the period 1986-2018?**

To answer the problem, we put together a set of sub-questions which are as follows:

- Is there a long-term relationship between the oil price and inflation rate?
- Is there a causal relationship between the oil price and inflation rate?

Hypotheses of the study: To study the problem of the subject put forward a number of hypotheses as follows:

- There is a long-term relationship between oil prices and the inflation rate in Algeria during the study period.

- There is a causal relationship between oil prices and inflation rate in Algeria during the study period.

The objectives of the study: The study aims at highlighting the effect of the oil prices and the inflation rate in Algeria, after the method of descriptive analysis and quantitative analysis method to show the effect, in light of the annual data to show the following aspects:

• To highlight the relationship between the oil prices and the inflation rate in Algeria during the study period.

• Clarifying the impact of the oil prices and the inflation rate in Algeria during the study period.

• To highlight the role of quantitative methods in measuring the impact of the oil prices and inflation rate in Algeria during the study period.

-Limitations of the study: Spatial framework: This study was conducted at the level of the Algerian economy.

- Time frame: The study period (1986-2018) has been determined.

2-Previous studies: There are many economic studies that dealt with the impact of the oil prices and the inflation rate, and the most important of these studies are the following:

2-1. (Hem C. & Kamal P , 2015): This paper aims to study the impact of oil price shocks on real output, inflation and the real exchange rate in Thailand, Malaysia, Singapore, the Philippines and Indonesia (ASEAN-5) using a Structural VAR model. The co-integration tests indicate that the macroeconomic variables of these countries are co-integrated and share common trends in the end. The variance decomposition results further assert that with a few exceptions, oil price shocks do not explain a significant variation in any of the variables under consideration. We also identify a unique pattern of response to oil price fluctuations between Malaysia and Singapore and between the Philippines and Thailand. The pairs exhibit a high degree of similarity in their responses; they do not share any commonalities across the group.

2-2. (Shafique M. , 2016): The aim of this paper is to examine the impact of the decline in oil prices on the Pakistani economy during the period from October 2011 to February 2016, in addition to other determinants of inflation. The results showed that there is an inverse relationship between the decline in crude oil prices and inflation. The results of the estimate also showed that crude oil prices have no effect on producer price index PPI in Pakistan.

2-3. (Brini, Jemmali, & Farroukh, September 2016): The objective of this paper is to examine the impact of oil price shocks on inflation and the real exchange rate of oil importers and exporters in the Middle East and North Africa (Tunisia, Algeria, Bahrain, Saudi Arabia and Iran) during the period from January 2000 to June 2015. using the VAR structural model, The results of the estimate showed that long-term oil price fluctuations significantly affect the real exchange rate of importing countries (Tunisia and Morocco) while the impact on inflation is lower. The results of the variance analysis show that oil price volatility contributes to the interpretation of the variance in the error of forecasting the real exchange rate, except for the real exchange rate in Algeria and Iran. However, the shock of oil prices does not contribute to the interpretation of variance in the error forecast inflation in Tunisia and Algeria.

2-4. (Trang, Tho, & Hong, 2017): This report aims to study the effect of oil prices on macroeconomic variables (inflation, growth rate, budget deficit and unemployment) in Vietnam during the period 2000-2015, using the VAR model; the results showed that high oil prices have led to higher inflation and budget deficits in Vietnam, while its effects on GDP growth and unemployment are unclear. The results also showed that a sudden random shock in oil prices caused inflation and budget deficits to rise. The response to GDP growth and unemployment was positive in the short term.

2-5. (Mohaddeseh Babajani Baboli, 2018): This paper aims to study the effect of shocks in the exchange rate, oil price, and production as the three main shocks in the economy on the most important variable in Iran's macro- economy, i.e. Price level. So, the vector auto-regression (VAR) model is used with seasonal data for the period of 1991-2016. After the model is estimated, impulse response functions are calculated and analysis of variance is performed to figure out the contribution of each shock in the variance of the prediction error of these variables. The results show that the strong dependence of exchange rate on foreign exchange earnings of oil price allows the rapid growth of the prices in Iran and the effect of the shock is increasing over time, but they influenced the exchange rate and inflation significantly.

3- Measuring the impact oil prices and the inflation rate during the period (1986-2018).

First: the presentation of variables and data and the study of chain stability.

3-1. Presentation of variables and data: The applied study needs data. We have obtained the annual data (1986-2018) from the World Bank, and the central bank of Algeria. Through this axis, we will use the following symbols for the variables in the econometric program and the time series (Eviews10): **Logarithm inflation rate** (Lninfl). - **Logarithm oil price** (Lnoilpr). Before estimating the vector autoregressive model, it is necessary to examine whether the previously mentioned series are stable or not in order to avoid the occurrence of the Spurious Regression problem (Cadoret I. &., 2004, p. 319), This term refers to the regression with good results in terms of t (F), But they do not give real meaning to the results, and do not provide a meaningful economic explanation. In other words, the use of the OLS method gives false results in the case of string instability.

3-2. Series stability study: For stationary testing, the time series of the variables of the study model in terms of the monolithic root unit test, DF (Dickey and Fuller: 1979) and Dickie Fuller (ADF), (Régis, 2004, pp. 150-152), Augmented Dickey-Fuller test. These tests demonstrate the nature and characteristics of the time series of the variables under study. Before applying the Dickie Fuller test, the delay of the series must be determined to determine the type of test used to detect the monotony in the series. The table shows the results of the dormancy test for the study variables by applying the extended time studying.

Table (01): Unit Root Test results for the study variables

UNIT ROOT TEST TABLE (ADF)			
At Level			
		LNINFL	LNOILPR
With Constant	T-Statistic	-2.5172	-1.2710
	Probe	***0.1212***	***0.6302***
		n0	n0
With Constant & Trend	T-Statistic	-2.7518	-1.7885
	Probe	***0.2245***	***0.6859***
		n0	n0
Without Constant & Trend	T-Statistic	-1.1675	0.7034
	Probe.	***0.2164***	***0.8621***
		n0	n0
At First Difference			

		D (LNINFL)	D (LNOILPR)
With Constant	T-Statistic	-7.9165	-4.8842
	Probe.	***0.0000***	***0.0005***
		***	***
With Constant & Trend	T-Statistic	-7.7762	-4.7623
	Probe.	***0.0000***	***0.0033***
		***	***
Without Constant & Trend	T-Statistic	-8.0561	-4.9168
	Probe.	***0.0000***	***0.0000***
		***	***
(*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1% and			

Source: Prepared by researchers based on outputs (E-views. 10)

The table (01), shows that the variables of the study are non-stationary at the non-stationary level, while the two variables reached the stage of stillness and stability at the level of 1%, 5% and 10%, after taking the first difference in the 1st difference. Thus, the time series is integrated with the first class CI ~ (1), which allows us to conduct co-integration tests.

4- Estimating the VAR model: After studying the time series in terms of stability, we found that the time series is stable after the first-order differences, i.e. They are integrated from the first order I (1), indicating the possibility of a common integration. According to this method, the estimation process is as follows:

4-1. Co-integration Test by Johansen- Julius method:

4-1-1. Determine the degree of path delay VAR: Before testing and estimating, the VAR delay should be determined, based on the Akaike and Schwarz criteria. Using the statistical program (Eviews), the results are as shown in table (02):

Table (02): Determining the degree of path delay VAR

VAR Lag Order Selection Criteria						
Endogenous variables: LNINFL LNOILPR						
Exogenous variables: C						
Date: 07/18/20 Time: 07:35						
Sample: 1986 2018						
Included observations: 30						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-70.81301	NA	0.519903	5.021587	5.115883	5.051119
1	**-31.20626**	**71.01899***	**0.044676***	**2.565949***	**2.848838***	**2.654546***
2	-29.40668	2.978617	0.052282	2.717702	3.189183	2.865364
3	-25.92197	5.287149	0.054854	2.753239	3.413313	2.959966

* indicates lag order selected by the criterion			
LR: sequential modified LR test statistic (each test at 5% level)			
FPE: Final prediction error			
AIC: Akaike information criterion			
SC: Schwarz information criterion			
HQ: Hannan-Quinn information criterion			

Source: Prepared by researchers based on outputs (E-views. 10)

Note from the table (02) we find that the optimum delay and approval for the smallest values of the criteria are P = 1.

4-1-2. Co-integration Test by Johansen- Julius method:

The results are shown in the following table: co-integration is tested according to the Johansen-Julius method according to the following assumptions:

$$i / H_0 : r = 0 / H_1 : r > 0$$
$$ii / H_0 : r = 1 / H_1 : r > 1$$

Table (03): Results of the co-integration test

Date: 07/18/20 Time: 07:39				
Sample (adjusted): 1988 2018				
Included observations: 31 after adjustments				
Trend assumption: Linear deterministic trend				
Series: LNINFL LNOILPR				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Probe.**
None	0.158188	7.030120	15.49471	0.5741
At most 1	0.060248	1.864173	3.841466	0.1721
Trace test indicates no co-integration at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Probe.**
None	0.158188	5.165946	14.26460	0.7207
At most 1	0.060248	1.864173	3.841466	0.1721
Max-eigenvalue test indicates no co-integration at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Prepared by researchers based on outputs (E-views.10)

The results of this test, shown in table (03), lead us to accept the alternative hypothesis because the calculated values of the Statistic Trace are less than the values of the statistical significance of 5%: Number of vectors), which means that there is no synchronous integration relationship between the variables studied. In this case, we estimate a direct regression model without any differences.
The results of the Max-Eigen Statistic test were also supported by the results of the impact test. The fact that the calculated value of this test is less than the value of the test at 5%, which means acceptance of the null hypothesis.

4-1-3. Granger Causality test:

The causal test showed no causal relationship, according to Granger, which is the result of variable oil price of the variable inflation rate at a significant level of 5%, i.e. (Probe=0.9599>0.05).
We noticed also the existence of a no causal relationship, according to the concept of Granger from the variable oil price to the variable inflation rate at a significant level of (5%), IE (probe=0.4752>0.05).

Table (04): Results of the Granger causality test

Pairwise Granger Causality Tests			
Date: 07/19/20 Time: 07:42			
Sample: 1986 2018			
Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Probe.
LNOILPR does not Granger Cause LNINFL	32	0.00257	0.9599
LNINFL does not Granger Cause LNOILPR		0.52395	0.4752

Source: Prepared by researchers based on outputs (E-views.10)

5- Estimating the Model VAR (1): After determining the appropriate delay for the one-year VAR model (P = 1) and applying the OLS method to estimate each equation of the model separately, we obtained the results shown in the table (05):

Table (05): Estimating Model VAR (1)

Vector Autoregression Estimates		
Date: 07/19/20 Time: 07:45		
Sample (adjusted): 1987 2018		
Included observations : 32 after adjustments		
Standard errors in ( ) & t-statistics in [ ]		
	LNINFL	LNOILPR
LNINFL(-1)	0.652403	-0.035453
	(0.15254)	(0.04898)
	[4.27695]	[-0.72385]
LNOILPR(-1)	-0.010815	0.903278
	(0.21330)	(0.06849)
	[-0.05070]	[13.1889]

C	0.630037	0.444500
	(0.89577)	(0.28762)
	[0.70335]	[1.54545]
R-squared	0.437267	0.884462
Adj. R-squared	0.397072	0.876210
Sum sq. resids	17.47604	1.801714
S.E. equation	0.790028	0.253667
F-statistic	10.87858	107.1728
Log likelihood	-35.10317	0.114259
Akaike AIC	2.458269	0.186177
Schwarz SC	2.597042	0.324950
Mean dependent	1.751924	3.527817
S.D. dependent	1.017442	0.720976
Determinant resid covariance (dof adj.)		0.034686
Determinant resid covariance		0.028297
Log likelihood		-32.71671
Akaike information criterion		2.497852
Schwarz criterion		2.775398
Number of coefficients		6

Source: Prepared by researchers based on outputs (E-views.10)

5-1 Study the validity of the VAR model:

5-1-1. Study the auto correlations to residual the equation VAR (1):

After we introduced the of vector autoregressive model, we test the validity through: To Study the autocorrelations to residual the equation VAR (1), use the LM TEST and Box-Pierce / Ljung-box probes to ensure that there is no autocorrelation between residuals in time series, the following table shows:

Table (06): test results Box-Pierce/Ljung-box

VAR Residual Portmanteau Tests for Autocorrelations					
Null Hypothesis: No residual auto correlations up to lag h					
Date : 07/19/20 Time: 07:49					
Sample: 1986 2018					
Included observations : 32					
Lags	Q-Stat	Prob.*	Adj Q-Stat	Prob.*	df
1	1.452044	---	1.500445	---	---
2	6.314475	0.1769	6.698217	0.1527	4
3	8.979035	0.3441	9.648265	0.2906	8
4	10.39332	0.5815	11.27207	0.5058	12
5	11.00975	0.8089	12.00705	0.7435	16
6	14.33140	0.8133	16.12589	0.7088	20
7	16.10268	0.8843	18.41380	0.7825	24

8	22.88738	0.7387	27.55840	0.4880	28
9	23.88874	0.8484	28.96940	0.6207	32
10	28.73837	0.7999	36.12838	0.4627	36
*Test is valid only for lags larger than the VAR lag order.					
df is degrees of freedom for (approximate) chi-square distribution					

Source: Prepared by researchers based on outputs (E-views.10)

Table (07): test results of LM TEST

VAR Residual Serial Correlation LM Tests						
Date: 07/19/20 Time: 07:50						
Sample: 1986 2018						
Included observations: 32						
Null hypothesis: No serial correlation at lag h						
Lag	LRE* stat	df	Probe.	Rao F-stat	df	Probe.
1	2.654270	4	0.6172	0.667783	(4, 50.0)	0.6174
2	5.056607	4	0.2815	1.302887	(4, 50.0)	0.2817
3	2.985547	4	0.5602	0.753594	(4, 50.0)	0.5604
4	1.706203	4	0.7896	0.425261	(4, 50.0)	0.7897
5	0.561393	4	0.9673	0.138356	(4, 50.0)	0.9673
6	3.433683	4	0.4880	0.870566	(4, 50.0)	0.4882
7	1.937925	4	0.7472	0.484121	(4, 50.0)	0.7473
8	8.054384	4	0.0896	2.138539	(4, 50.0)	0.0897
9	1.552357	4	0.8173	0.386329	(4, 50.0)	0.8174
10	7.211634	4	0.1251	1.898632	(4, 50.0)	0.1253

Source: Prepared by researchers based on outputs (E-views. 10)

We see from the tables above (06) and (07), the probability value prop is greater than the critique level of 5% and, therefore, we accept the null hypothesis that there is no autocorrelation between equation residuals.

5-1-2. VAR model stability study: To examine the stability of the model was employed the polynomial root test, and according to this test, the results of vector autoregressive are stable if there are no roots equal to one, and the following table shows the results of this test:

Table (08): Stability Model VAR (1)

Roots of Characteristic Polynomial	
Endogenous variables: LNINFL LNOILPR	
Exogenous variables: C	
Lag specification: 1 1	
Date: 07/19/20 Time: 07:52	
Root	Modulus
0.904798	0.904798
0.650884	0.650884

No root lies outside the unit circle.
VAR satisfies the stability condition.

Source: Prepared by researchers based on outputs (E-views. 10)

Note from the table (08) that all the roots are less than one and therefore the vector autoregressive is stable.

5-2. Structural Study of the VAR (1) Model: In order to assess the nature of the relationships between variables in the short term, variance decomposition and impulse response function are used. Using the Cholesky criterion, the order of the variables is assumed to be in order, where each variable is simultaneously affected by its previous variables in order but not by the following variables. The results of the variance analysis and pulse response functions are sensitive to the way in which variables are arranged. Sometimes, Granger's causality is used to determine the direction of the relationship between variables and the variables is then arranged on this basis.

5-2-1. Shock Analysis (Pulse Response Functions): Pulse response is the behavior of the internal variables in the model due to the various shocks that the system may experience. This test is intended to demonstrate the ability of the variables involved in the model to interpret each other's behavior by knowing the impact of a variation on the rest of the variables. During our study of response functions, we will apply shocks in the first period, and then study their effect on the remaining variables over 10 years. According to the results, the responses of each of the variables examined for the various innovations can be monitored as follows:

5-2-1-1. Response variable inflation rate for various renovations: Table (09) shows that a sudden shock and one standard deviation of the oil price variants will be accompanied by a negative response to the inflation variability during the 10 year response period, with a response of (-0.2549%), continuing to increase at rates decreasing to the end of the tenth period recording a response (-0.3870%).

While the inflation variable responds to unexpected shocks, which is positively affected as it has started to decline since the first period recording a response of (79.00%), continuing its downward trend at increasing rates until the end of the tenth period (1.99%). This is illustrated in Table (09):

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Table (09): Estimation and Simulation of Pulse Response Functions
Impulse Response to Cholesky (d.f. Adjusted One S.D. Innovation)

Response of LNOILPR:		
Period	LNINFL	LNOILPR
1	-0.093670	0.235739
2	-0.112618	0.212938
3	-0.120035	0.192433
4	-0.120413	0.173961
5	-0.116633	0.157301
6	-0.110531	0.142261
7	-0.103263	0.128676
8	-0.095551	0.116398
9	-0.087834	0.105299
10	-0.080369	0.095263
Cholesky Ordering: LNINFL LNOILPR		

Response of LNINFL:		
Period	LNINFL	LNOILPR
1	0.790028	0.000000
2	0.516430	-0.002549
3	0.338138	-0.003966
4	0.221901	-0.004669
5	0.146071	-0.004927
6	0.096559	-0.004916
7	0.064190	-0.004746
8	0.042995	-0.004488
9	0.029083	-0.004187
10	0.019924	-0.003870

iews. 10)

5-2-1-2. Response variable oil price for various renovations: Table (09) shows the response of the oil price variable due to a random shock of one standard deviation in the inflation variable, It is clear from this that the effect of the inflation variable on the oil price variable will be negative over the period of responses. The effect of this variable will be -9.36% in response to the shock in the first period, while it will reach a maximum level of -12.00% The fourth period, after which the variable inflation rate continues to decline at decreasing rates, until the end of the tenth period in response (-8.03%).

While the oil price variable responds positively to the unexpected events as it has been declining since the first period recording a 23.57% response, continuing its downward trend at increasing rates until the end of the tenth period in response (9.52%).

5.2.2 Analysis of the variance of the forecast error: Variance decomposition analysis is the knowledge of the ratio of variation caused by a variable in itself and in other variables. In this case, it is not assumed that shocks to the variable are occurring, but rather we examine the relationship between variables.

In order to determine the amount of the variance error of the Lninfl variable to the prediction error in the same variable, and the amount due to the prediction error in the other variables, so that there is no serial correlation between the random errors. the importance of this test is that it gives the relative effect of any sudden change (shock), in each variable of the study all other variables, as shown in Table 10:

Table (10): Analysis of the variance of forecast error of the oil price variable LNOILPR

Variance Decomposition of LNOILPR:			
Period	S.E.	LNINFL	LNOILPR
1	0.253667	13.63550	86.36450
2	0.349818	17.53414	82.46586
3	0.416907	20.63463	79.36537
4	0.467518	23.04244	76.95756
5	0.506872	24.89798	75.10202
6	0.537936	26.32739	73.67261
7	0.562668	27.43189	72.56811
8	0.582472	28.28928	71.71072
9	0.598395	28.95830	71.04170
10	0.611237	29.48312	70.51688
Cholesky Ordering: LNINFL LNOILPR			

Source: Prepared by researchers based on outputs (E-views. 10)

Table (10) shows that the standard error of the inflation error of the inflation variable in the first period is (25.36%) and increases over time to (64.63%) in the tenth year. The increase in the standard error value is due to the uncertainty prior to the inflation rate variable.

The variance of the prediction error of the oil price change in the first period of (86.36%) from its previous value in the short term is due to the same variable, and then decreases to (70.51%) in a forecast period of 10 years in the future. Therefore, shocks in the oil price variable explain the variation In the error of predicting the oil price variable itself in the short term more than in the long term.

The opposite is true for the inflation variable. The variable oil price contributes to the interpretation of the difference in the forecast error of the inflation variables by (13.63%). The ratio increases over the forecast periods to the highest level in the tenth year to explain 29.48% the variance in the forecast error of the inflation variable. Therefore, shocks in the oil price variable contribute to the interpretation of the variance in the forecast error of the long-term inflation variable with a larger than short-term roles, which reflects the role of the oil price variable in explaining the volatility of the inflation variable. However, the variance components of the variable inflation rate are affected by the changing price of oil, so that any sudden random change or shock in the variable oil price will affect the inflation variable. The following table shows the results of the analysis of the variance components of the variable LNINFL:

Table (11): Analysis of the variance of forecast error for inflation variable LNINFL.

Variance Decomposition of LNINFL:			
Period	S.E.	LNINFL	LNOILPR
1	0.790028	100.0000	0.000000
2	0.943849	99.99927	0.000730
3	1.002599	99.99779	0.002212
4	1.026872	99.99582	0.004175
5	1.037221	99.99365	0.006349
6	1.041717	99.99148	0.008521
7	1.043704	99.98944	0.010556
8	1.044598	99.98762	0.012383
9	1.045012	99.98602	0.013979
10	1.045209	99.98466	0.015344

Source: Prepared by researchers based on outputs (E-views.10).

Table (11) shows that the variance of the forecast error of the inflation variable in the first period of (100%) is due to the same variable, while the decrease in this ratio in the second period of (99.99%) is less than its previous value in the short term (one prediction period in the future). This percentage decreases to (99.98%) in a forecast period of 10 years in the future.

The remainder is due to the variable oil price. The variance of the forecast error is (0.073%). The ratio starts to rise to (1.53%) in a forecast period of 10 years in the future.

However, the components of the variance of the inflation variable are affected by the oil price variables. Thus, a sudden random change or shock in the oil price variable will affect the inflation variable.

6- Conclusion and Recommendations

6-1. Conclusions

In this study, the impact oil prices at the inflation rate were highlighted in Algeria during the period (1986-2018). In line with the nature of the subject, the descriptive data were analyzed and a standard economic model for the impact oil prices on inflation rates in Algeria, Using the latest standard techniques in the analysis of co-integration and VAR models. The study concluded with a set of results summarized as follows:

- All the results of the unit root tests showed that the study variables were at the root of the unit, that is, they are unstable at the non-stationary level and stable at the 1st difference, meaning that they are first-class CI ~ (1);
- The results of the Co-integration tests indicated the rejection of the alternative hypothesis (there is a synchronous integration relationship between the variables), and the acceptance of the null hypothesis, because the calculated value of the

statistical effect is less than the expected value of 5%, Since: $rang(\Pi) = 0$, i.e $r = 0$ (r :Number of vectors), Which means that there is no synchronous integration between the variables studied. In this case, we estimate the VAR model without any differences. The results of the Max-Eigen Statistic test were also supported by the results of the impact test. The fact that the calculated value of this test is less than the value of the test is 5%, which means acceptance of the alternative hypothesis;

- Granger's tests are among the most important uses of VAR models, and are at the same time the most important econometric analysis tools offered by this technique. The causal test showed no causal relationship - according to Granger;
- The study results Shown, there is an inverse relationship between the oil prices and the inflation rate, this result corresponds to the study (Muhammad J Shafique2016);
- The results indicate that the components of the variance of the inflation rate are affected by the change in the oil price. Thus, the occurrence of any random change or random shock in the variable oil price will negatively affect the inflation rate; this result corresponds to the study (Mohaddeseh Babajani Baboli and al 2018).

6-2. Recommendations:

- The need to reduce the dependence on hydrocarbon revenues significantly and to encourage exports outside the hydrocarbon sector through increased support for the agricultural and industrial sector, and diversification of investments to provide employment;
- The need to reduce the inflation rate;
- The importance of giving sufficient importance to the studies of standard and predictive by establishing special laboratories, and taking their results seriously so that these studies will not only remain ink on paper;
- Since the accuracy of the studies depends heavily on the accuracy and comprehensiveness of the available statistical data, and because of the discrepancy of the data obtained, we recommend to the various statistical agencies competent to complete the statistical database of macroeconomic variables;
- Trying to develop the model of the study by introducing other variables of the model, reflecting the statistical and economic relationship in accordance with the Basics of economic theory.

7. Bibliography List :

Hem C. Basnet & Kamal P Upadhyaya., « *Impact of oil price shocks on output, inflation and the real exchange rate: Evidence from selected ASEAN countries*», Journal Applied Economics,(47),2015.

Shafique, M. J., « *Plunging Crude Oil Prices and Its Effect on Inflation in Pakistan* », Journal of Energy Technologies and Policy, (10),2016.

Brini, R., Jemmali, H., & Farroukh, A.,« *Macroeconomic impacts of oil price shocks on inflation and real exchange rate: Evidence from selected MENA countries*», Topics in Middle Eastern and African Economies, September,18(2),2016.

Trang, N. T., Tho, T. N., & Hong, D. T., « *The Impact of Oil Price on the Growth, Inflation*», Unemployment. International Journal of Energy Economics and Policy ,7(3),2017.

Mohaddeseh Babajani Baboli & al. « *The Impact of Shocks in Oil price and Exchange Rate on Inflation in Iran: The Application of the VAR Approach*, Environmental Energy and Economic Research » , 2 (1),2018: 51-61.

Isabelle Cadore, & other., *Econométrie appliquée. Bruxelles, Belgique*», *Edition De Boeck,2004.*

Régis Bourbonnais, & Michel Terraza., *L'analyse des séries temporelles en économies* (1ère édition). Paris: PUF,2004.

Landrine Lardic, & Valérie Mignon., *Econométrie de la série chronologique macroéconomique et financière. Paris: Economica,2002.*

World Bank., *World Development Indicators,2019,Consulted: 12 /07/ 2020, sure:*https://www.worldbank.org/.