Fluctuation of Exchange Rates and Their Impact on Exports Outside the Hydrocarbon Sector in Algeria

Kout Mebarek [1], Khamed Mustapha [2]

[1] Kasdi Merbah University (Ouargla), m.elkout@lagh-univ.dz

[2] Kasdi Merbah University (Ouargla), khmousta@yahoo.com

Abstract

This study aims to know the impact of the exchange rate fluctuations on exports outside the Algerian hydrocarbons from 2000 to 2017, using the models of the VAR self -decline, and concluded that there is no statistically significant effect for each of the Algerian dinar exchange rate against the US dollar and the European euro on exports outside the hydrocarbons, Also, the development of Algerian exports outside fuel is linked to the development of hydrocarbons, and this is the fact that the semi -made products that represent the vast percentage of exports outside fuel are a fuel derivative, so their prices are largely related to fuel prices.

The collapse of the Algerian dinar against the US dollar and the euro is due to the reduction of its value by the monetary authority that returns this procedure in order to support and encourage Algerian exports, but this measure is inappropriate due to the palaces of the national productive structure and its inability to cover the national market in quantity and quality as well as to and face foreign markets, which is considered Unjust procedure given the needs of the national market and its association with the European market in particular.

Keywords: exchange rate, non-hydrocarbon exports, VAR self-regression vector models.

1- INTRODUCTION:

External trade is the most important image of international economic relations, as it represents the oldest and most advanced traditional form of these relations, and around them all forms of international division of work. It has gone through many stages of cognitive, scientific and practical accumulation, starting from the practices of the Phoenicians and then Muslims and then the theses of the commercial, the natural and the classic, then the theories and models of the modern economists, to the serious stage in which the global economic system will lead from root developments and changes that have been destroyed by the enemy from its aspects, and pushed many From countries to discuss ways to deal, cope and integrate into the global economy in a way that serves their interests and guarantees their survival, and this is by establishing economic blocs and international organizations, perhaps the most important of which is the World Trade Organization (WTO).

Accordingly, the exchange rate can be considered a new commercial protection tool, which has an impact on the levels of the economy internally or externally, and its importance is also due to the fact that it affects the total economic variables of international economics, whether related to the size of foreign trade, international precautions and the balance of payments, which made some countries use it In order to achieve what is in line with economic policies at the total level. As for the partial level, the exchange rate has a great impact on increasing the competitiveness of the exported institutions and their growth, as it has risks that affect the payments and exhibits of those institutions, as the change of the exchange rate may cost the institution to pay more value in exchange for its purchases or capture a lower value for its sales.

1-1 Objectives of the study:

This study aims to clarify the impact of the fluctuations of the Algerian dinar exchange rate against the US dollar and the European euro on exports outside fuel, and to show how the exchange rate is used as a price competitive tool in a way that guarantees a new resource for hard currency and to motivate the national productive system, and an important exit as an alternative to the entrances to hydrocarbons.

1-2 Study Approach:

We will try to address the subject of the study through two chapters, where we address in the first chapter the basic concepts of theoretical study. As for the second chapter, it will be a field study for research in the statistical and

standard relationship between the variables of the study crowned with results and discussion, then a conclusion that includes a summary of the study.

2- Theoretical literature

The value of the currency can be expressed by the reason or basis that makes the currency accepted in economic life. There is the metallic basis for accepting the currency in circulation, there is the governmental basis for accepting the currency in circulation because it is manufactured or issued by the state (mandatory), and there is the basis based on individuals' confidence in the currency. (Mehrara, The Relationship between non-oil Trade and GDP in Petroleum Exporting Countries, 2013)

The expression "currency value" may mean "the regulatory or legal value of the currency," meaning the value of the currency in the internal monetary system (the currency is a measure of economic values), which has both legal and final characteristics in the internal monetary system. (labib, 2005)

2.1 Mechanisms for determining the value of the currency

The value of the currency is determined in two ways, either directly, which is for the state to set a maximum limit on the amount of currency issued by the issuing bank; Or the method is indirect by specifying the type of cover that must be available for each quantity issued. (rahim, 2008)

2.3. The value of the currency and its relationship to foreign reserves

The foreign currency reserve is considered a tool for controlling the exchange rate, as exchange operations lead to an expansion or contraction of the amount of the local currency in circulation, which directly affects monetary policy, inflation, and the target exchange rate, and thus the value of the local currency, and to maintain the same exchange rate in the event of an increase in demand. The central bank can sell more local currency in exchange for foreign currencies, which increases the foreign currency reserve. In this case, the value of the local currency deteriorates relative to the value of goods and services. (G, 2011)

2.4. Factors affecting the exchange rate

There are many factors that lead to fluctuations in exchange rates, including the following: (Asli, 2010)

Change in inflation rates assuming other factors remain constant: Inflation leads to a decrease in the value of the currency in the exchange market, especially in the event that monetary and financial measures are not taken to keep the value of the currency high, so it requires devaluation of the currency in the event of a recession, which leads to an increase in the value of the currency;

Change in the value of exports and imports: An increase in the state's export earnings and the current account surplus lead to an increase in foreign currencies and their accumulation, resulting in a change in the exchange rate and a rise in the value of the national currency.

Also, the level of openness of the movement of capital flows greatly and directly affects exchange rates. If these flows increase beyond the absorptive capacity of the national economy, this leads to an increase in foreign reserves and thus an increase in the value of the national currency, and the opposite happens in the event of capital flight abroad.

Change in interest rates: A rise in real interest rates will attract foreign capital, and this leads to an increase in the value of the currency due to the demand for it. However, if international interest rates rise, this stimulates investors to demand foreign currency in order to obtain more returns in international markets, and thus An increase in the value of the foreign currency and a decrease in the local currency exchange rate.

2.5. Exchange rate systems

The references of the International Monetary Fund indicate eight main exchange systems applied by countries, with their differences in the goals and foundations that each country adopts to achieve the optimal price for its national currency, and they include the following :(Barbour, 2008)

Allowing the circulation of another country's currency locally, such as the dollar, for example, instead of the national currency, or joining a monetary union that issues a single currency for all member states;

The monetary authority's commitment to peg the national currency to a foreign currency at a fixed exchange rate that cannot be changed or amended under the supervision of the currency board;

Linking the price of the national currency to a single foreign currency or a group of currencies. This system allows the price of the currency to move up or down by a maximum of 1%. It is known as managed float, and it is the most popular system among countries.

Linking the exchange rate to another foreign currency, but allowing it to move up or down by more than 1%;

The moving peg system, which requires a simple periodic adjustment of the national currency exchange rate according to a previously announced schedule or in response to agreed upon economic indicators;

The system of moving margins, which allows the rise and fall of the currency within the framework of a fixed price that is adjusted according to a previously announced schedule or in response to economic indicators. It is a system that depends on price stability as a basis for determining the exchange rate;

Managed float: whereby monetary authorities direct exchange rates through direct intervention by buying or selling in the money markets;

Complete flotation according to market movement, where the role of the central bank is limited to absorbing sharp fluctuations and achieving the required moderation without interfering in the direction of prices up or down.

2.6. PREVIOUS STUDIES

Before learning about the impact of the dollar and euro currencies on Algerian foreign trade, we must first address the characteristics of the latter and what distinguishes it from other countries, especially since Algeria is an oil exporting country. Therefore, we will learn about some studies that have addressed this topic.

Table no. 1 – Summary of the most important previous studies

Researcher's name	Year of study	Study data	Results
Hooper et Kohlhagen	1983	Sample quarterly data for the period (1965-1975) using a nominal exchange rate	There is no effect of the exchange rate on the volume of trade
Kenen et Rodrick	2002	Quarterly data for Canada and other industrialized countries for the period (1975-1982)	There is no effect of the real exchange rate on the volume of trade
Bailey, Tavlas et Ulan	2007	Quarterly data for the countries of the Council for Economic Cooperation (OCED) for the period 1975-1985-1962-1974	There is no explanatory relationship to the actual exchange rate.
Virginie Coudert, Valerie Mignon, Alexis Penot	2008	Monthly data for the period 1974-2004, oil price, real actual dollar exchange rate.	The existence of a positive, long-term relationship between the two variables, and the existence of a causal relationship that results in Reduce the price

			of oil to the exchange rate of the dollar
Christian Grisse	2010	Weekly data for the price of oil, and quarterly data for the exchange rate of the dollar and the interest rate of the United States, for the period 2003-2010.	There is a negative relationship between the price of oil and the exchange rate of the dollar and the interest rate His LOM explains a large part of this negative relationship.
Azeri abdelhafid Zouaoui Chiker Elmezouar	2013	From May 1, 2008 to February 1, 2013, the price of oil, the exchange rate of the dollar against the euro	There is a short- and long-term relationship between the two variables, in addition to the existence of a clear causal relationship that goes from the price of the euro to the dollar/oil exchange rates.
Gabriel Gomes /May	2016	From the year 1980 to 2014 for a sample of 16 oil-exporting countries (11 OPEC countries), the dollar exchange rate, the oil price rate, the real exchange rate of the oil-exporting countries	The increase in oil prices leads to an increase in the real exchange rate of these countries in the long term (this confirms that they are oil currencies). Oil currencies move in coordination with the oil price if the dollar exchange rate does not rise by 2.5%. About its real value, while if it rises above this percentage, the relationship between oil currencies and the price of oil becomes negative.
Jiaqi Jiang, RongbaoGu/	2016	Daily data from June 4, 2000 to December 31, 2014, Oil price, dollar exchange rate, Structural shocks to oil	The mutual correlation between the dollar exchange rate and the oil price is not Effective when separating structural shocks For oil.
VirginieCoudert, Valérie Mignon/	2016	From 1974 to 2015 The real price of oil, the actual exchange rate of the dollar.	There is no long-term relationship between the two short-term variables, but there is a long-term relationship that goes from the dollar exchange rate to the oil price, which is negative during the entire period, while it's positive when sample ends at the year 2004.
Selien De Schryder, GertPeersman/	2013	From the year 1971 to 2008 for a sample of 65 oil-importing countries (non-dollar zones), oil demand, dollar exchange rate, oil price.	The rise in the value of the dollar leads to a decline in demand for oil, and its impact on oil prices itself is stronger than the impact of demand for oil.
Marcel Fratzscher,	2014	From January 2, 2001 to October 19, 2012, oil price, dollar exchange rate, financial	There is a two-way causality between the price of oil and the exchange rate of the dollar since 2001, and this is

		asset prices.	due to the influence of both variables on the risks and returns of the stock market, as oil prices did not interact with changes in financial assets before 2001, as this can be explained by the increased use of oil as assets financial over the past decade
Daniel Schneider, Ine Van Robays/ july			

Source Prepared by the researchers based on various sources

3. RESULTS

We deal with the way in which the study took place in its experimental or field part, then we indicate the tools that were used, where we dealt with two models* statistics for the Algerian economy, the first studies the relationship between the exchange rate of the Algerian dinar against the US dollar and exports outside fuel, and the second studies the relationship between the dinar exchange rate Algerian opposite the European euro and exports outside the fuel as well, and this is after it was not possible to address one model that collects the three variables, as we found that the exchange rate of the Algerian dinar against the US dollar does not have sufficient moral in the estimated decline equation- although we introduced the logarithm on the values of views to overcome this problem- and this Refer to his weak relationship with exports outside hydrocarbons compared to the exchange rate of the Algerian dinar against the European euro, and the strong competition for the latter.

In the table below, we refer to the symbols of the study variables that were used to estimate mathematical equations as follows:

Table (1): Definition of study variables

N	code	variable
1	ERDDOLLAR	The exchange rate of the Algerian dinar against the US dollar
2	ERDEURO	The exchange rate of the Algerian dinar against the European euro
3	EXHH	Export outside hydrocarbons

Source: Prepared by researchers.

And from it we give the variable form of the model as follows:

Exhht = □ (Erdollar, Erdeurot)

Assuming the linear relationship between the variables, the sporting model for the study as follows:

Exhht = □0 + □1*erdollar + □2*Erdeurot + □t ……………. (1)

whereas:

□0: It is a fixed (cutter) limit;

□1, □2: They are parameters for both Erdollar and Erdeuro, respectively;

□T: It is the random error that includes variables that the model has not covered and it affects it. (Philips, 1988)

As a first step, we will represent the time chains related to study variables graphically to analyze their development and clarify their behavior over time, because of the importance of the graphic drawing where one of the authors comments: "Every person tries to analyze a series of time without drawing, as he is exposed to problems as follows:

• The exchange rate of the Algerian dinar against the US dollar for the period from 2000 to 2017

Figure (1): The developed of the Algerian dinar exchange rate against the US dollar
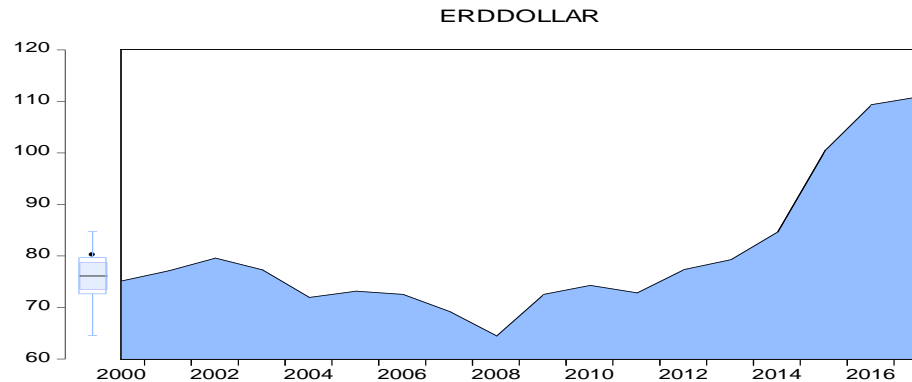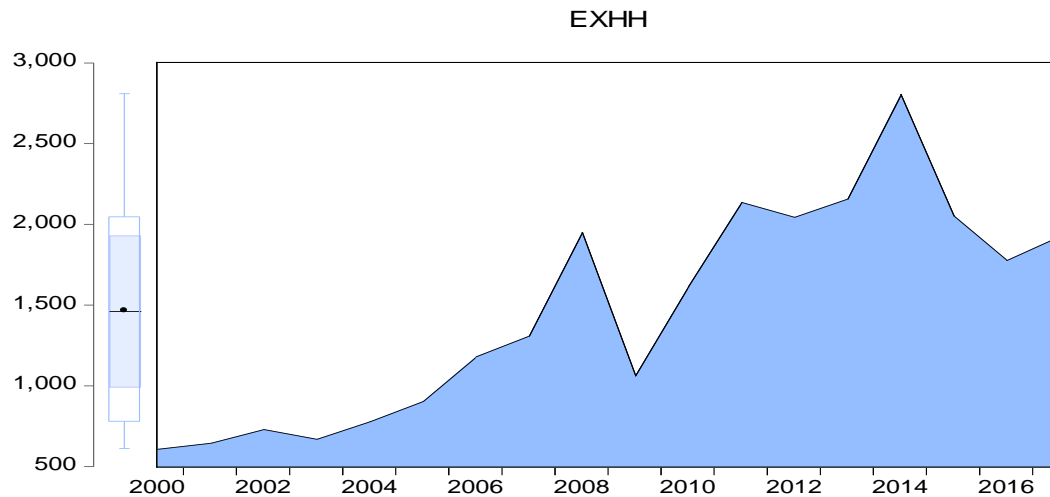

Source: EVIEWS 10 program outputs

We note from the above graph that the Algerian dinar defined an improvement against the US dollar in 2008 as a result of the impact of the global financial crisis on the dollar, after which the retreat and collapse of the Algerian dinar will return as a result of reducing its value by the monetary authority that returns this procedure in order to support and encourage Algerian exports, but this measure is not Suitable due to the palaces of the national productive structure and its inability to cover the national market in quantity and quality as well as the face of foreign markets, as this measure is due to the sake of curbing foreign imports, which is also considered incredible in view of the needs of the national market and its association with the European market in particular.

Figure (2): The developed of the Algerian dinar exchange rate against the European euro
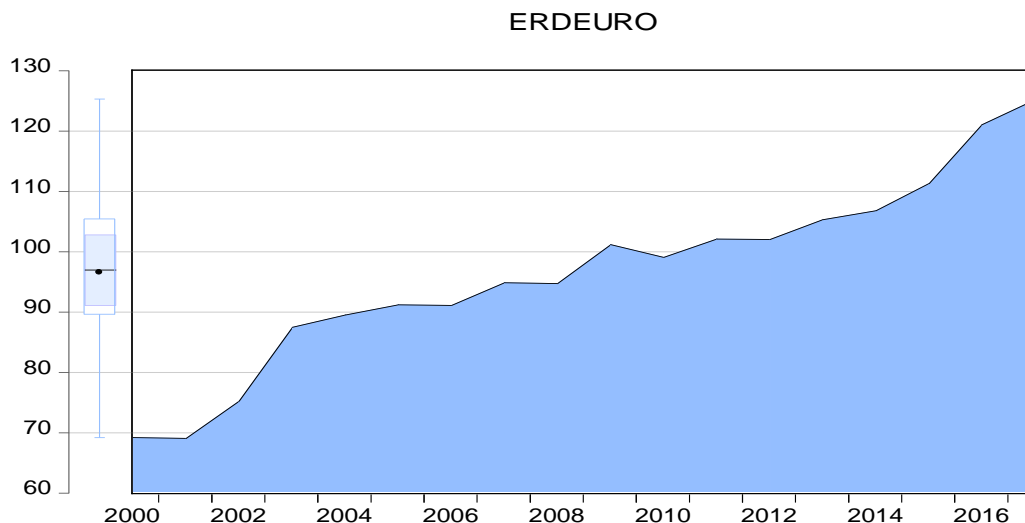
Source: EVIEWS 10 program outputs

We note from the above graph that since the beginning of the official dealing in the European euro, the Algerian dinar began to lose its value in front of it, and this is due to the direction of the close Algerian European economic relations, the Algerian community is mostly living in European countries, especially France, Italy and Spain, and Europe is the first financier of Algeria in terms of The imports and the majority of Algerian exports are mostly directed to European countries, especially after this in the 2005 euro partnership, on the one hand, and on the other hand, the European euro is ranked second in the world after the US dollar and a strong competitor to it.

Figure (3): The development of Algerian exports outside fuel

EXHH

Source: EVIEWS 10 program outputs

We note from the above graph that Algerian exports outside the fuel witnessed a remarkable development from the beginning of the study period until the year 2008 to witness the year 2009 a strong shock impact of the global financial crisis, as it decreased by 45%, i.e. from 1954 to 1066 million US dollars, after which the improved improvement will be resolved 2013 And 2014 by 2161 and 2810 million US dollars, respectively, to witness another shock in 2016, and we note that the development of Algerian exports outside the hydrocarbons is largely linked to the development of hydrocarbons, and this is that the semi -made products that represent the greatest percentage of exports outside hydrocarbons are mainly from Details of fuel, so their prices are largely linked to fuel prices.

VAR Model Diagnosis

We will diagnose the form and test the authority to ensure that it is free of measuring errors, such as its total and partial stability test, and the stability of the rest and subject to natural distribution. (Dickey, 1981)

1. Form Stability Test:

After estimating the VAR model, we must test its stability with the necessary tests as follows:

Table (2): VAR model stability test results

Roots of Characteristic Polynomial
Endogenous variables: D1EXHH D1ERDDOLLAR
Exogenous variables: C
Lag specification: 1 1
Date: 07/04/19   Time: 11:26

Root	Modulus
0.579445	0.579445
-0.397521	0.397521

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

Source: EVIEWS 10 program outputs

2. Self -link testing between the rest:

Self -association in general indicates that there is a link between the values seen by the same variable, and in the slope models usually the problem of self -association indicates that there is a link between the successive values of the random limit (the rest), and in this case the value of the correlation coefficient between the successive values of the random limit (or laboratories Tags) is not equal to zero, and this violates one of the assumptions on which the regular small squares method are based.

Through the results, it adopts that all probability values and at all degrees of delay are greater than critical values level 5 %, which leads us to accept the zero hypothesis that the remaining model does not have self In the model (T-1).

A note, the VAR model is suitable for use even if there is a link between the remaining form of the form of the form.

Export model outside hydrocarbons: a continued variable and the price of the Algerian dinar exchange against the European euro as an independent variable, and given that the two variables are complementary from the first and second ranks in a row, we try to study this model in a way of x -ray model (vertebra). VAR;

And from it we give the variable form of the model as follows:

Exht = ☐ (Erdeurot)

Assuming the linear relationship between the variables, the formula of the statistical model of the study as follows:

Exhht = ☐0 + ☐2*erdeurot + ☐t ………………. (3)

whereas:

☐0: It is a fixed (cutter) limit;

☐1: She is an Erdeuro teacher;

☐T: It is the random error that includes variables that the model has not covered and it affects it.

Since the two series are not complementary from the first rank, as the third series (EXH) is integrated from the first rank, while the second series is integrated from the second rank (Erdeuro), so we cannot estimate the relationship of joint integration between them, so we will estimate the relationship between them with a ray model (Varieties (Self - slope VAR.

a. Building VAR model

As a result of the lack of a joint integration between the two series, which means that there is no long -term relationship between the exchange rate of the Algerian dinar against the European euro on the one hand and the exports outside the hydrocarbons on the other hand, it remains for us to search for a short -term relationship between them through the x -ray model (vectors) of slope VAR self, through which we will appreciate the short -term relationship between the two series.

To build the model, we will first determine the delay period for the two series together in order to use it in appreciation, then study and determine the relationship of causation* in the short term, i.e. knowledge of the dependent variable and the independent variable, then we diagnose the remaining model and make sure that it is free of measurement problems used in this several tests, the most important of which are: test Form stability, self -association test between the remaining, contrast stability test, natural distribution test of the rest, white chosen tested for the rest,

stable stability examination, then we address the structural analysis of the model used immediate response functions analysis and analysis of contrast components.

Determine the direction of causation between the two series:

Table (03): The results of the causal direction test between the Algerian dinar exchange rate against the European euro and the exports outside the fuel

Pairwise Granger Causality Tests Date: 01/08/21 Time: 21:24 Sample: 2000 2017 Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Prob.
D2ERDEURO does not Granger Cause D1EXHH	17	3.70155	0.0749
D1EXHH does not Granger Cause D2ERDEURO		1.05107	0.3226

Source: EVIEWS 10 program outputs

The above table shows the test results for two zero hypotheses as follows:

Zero hypothesis 1: Erdeuro does not cause Exhh and is not acceptable because ProB = 0.0749> 0.05)); Consequently, we accept the alternative hypothesis, which causes EXHH, and from which exports can be predicted outside fuel, starting from the dinar exchange rate against the European euro. (Mehrara, The Relationship between non-oil Trade and GDP in Petroleum Exporting Countries, 2013)

The zero hypothesis 2: Exhh does not cause Erdeuro and is rejected because ProB = 0.3226> 0.05)), meaning that we acknowledge and accept the alternative hypothesis, i.e. EXHH causes Erdeuro, and from it you can predict the price of the dinar exchange against the European euro from exports outside the hydrocarbons

From it, exports outside fuel causes the exchange rate of the Algerian dinar against the European euro and the latter causes exports outside fuel, and from it we conclude that it is possible to predict the price of the Algerian dinar exchange against the European euro using exports outside the fuel, and exports can be predicted outside the hydrocarbons using the exchange rate of the Algerian dinar Vs. European euro, and therefore there is a two -way causal relationship. (Engle, 1987)

This result may be due to the nature of the Algerian -European economic relations and the high number of the Algerian community in it, as well as the geographical distribution of Algerian exports outside the hydrocarbons, which are directed towards Europe in a large percentage, so it is very sensitive to any change in the value of the Algerian dinar against the European euro on the one hand, and on the other hand, and on the other hand Likewise, the increase in the demand for Algerian exports outside the hydrocarbons means that there is a demand for the national currency, and thus the value of the national currency is affected as a result.

4. **conclusion**

Through our study, we studied the basic concepts of the exchange rate and exports outside the fuel in order to build a theoretical perception to design a standard model aimed at measuring the relationship between the two phenomena, as we took the exchange rate of the Algerian dinar against the US dollar and the European euro as independent variables and exports outside the fuel as a continued variable to conclude that this model is not Statistically Saleh, we encountered the problem of non -morality of the Algerian dinar exchange against the US dollar in the estimated decline equation, despite the introduction of the logarithm to the values of views to overcome this problem.

This is what we had to take into account to two independent models, the first concerned with studying the exchange rate of the Algerian dinar against the US dollar as an independent variable and exports outside the fuel as a continued variable, while the second model takes the exchange rate of the Algerian dinar against the European euro independent and exports outside a continued variable.

Using economic measurement techniques (models of Self -slope VAR), and software (EVIEWS 10) and Electronic Tables Program (Excel), we have tackled these two models to conclude that the effect of both exchange rate on exports outside fuel is very weak in terms of statistical (field study) fluctuations The exchange rate of the Algerian dinar against the US dollar, as well as the fluctuations of the Algerian dinar exchange rate against the European euro is not a strong impact on exports outside the hydrocarbons in Algeria.

Consequently, we conclude that the main hypothesis of our study, which provides for the possibility of using the exchange rate as a price competitive tool, as its fluctuations strongly affect national exports outside the hydrocarbons are incorrect.

Based on the foregoing, as well as based on the results emanating from the theoretical and field study on the problem of the study, we have made recommendations that we see that may contribute to raising the level of export outside and diversifying the export, and stimulating the national productive system as follows:

• Working to benefit from the income of hydrocarbons- especially during its rise periods- in supporting the productive base and diversifying national production, with the aim of facing successive periodic oil crises;
• Attention to small and medium enterprises, and the strong institutions (Startup) and supporting contracting thought among young people, especially university students;
• Directing the authorities 'attention to the sectors of industry and agriculture, especially as they are creative sectors of wealth in order to reach a production base that can achieve self -sufficiency first and provide a pot for export as a second stage, without neglecting the role of the tourism sector;
• Improving the quality of national products to increase their competitiveness and from there to foreign markets as exports;
• Opening the doors for foreign direct investment, especially in the agricultural field, in which Algeria has strengths that enable it to be a promising food basket;

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