

**Export competitiveness is the choice of small and medium enterprises
to promote Algerian exports.**

(An Econometric Study for the Period 2004 - 2022)

BELKHEIR Farid ^{1*}, SEHANINE Miloud ²

¹ University of Tiaret, farid.belkheir@univ-tiaret.dz

² University of Mascara, miloud.sehanine@univ-mascara.dz

Received: 08/01/2025

Accepted: 07/05/2025

Published: 01/06/2025

Abstract:

This research paper sought to investigate the extent to which Algerian non-hydrocarbon exports responded to the development of small and medium enterprises in Algeria during the period from 2004 to 2022.

The Autoregressive Distributed Lag (ARDL) methodology was employed to identify the dynamic relationship between the growth of both public and private small and medium enterprises and non-oil exports in the short and long term. The study found a direct relationship or a positive effect between the development of private sector small and medium enterprises and the levels of non-hydrocarbon export values in Algeria during the studied period, in both the short and long terms.

Keywords: export competitiveness, small and medium enterprises, non-hydrocarbon exports, Algeria, ARDL methodology.

Jel Classification Codes: F10, C50, L20.

* Corresponding author

1. INTRODUCTION

Anyone who follows the performance of small and medium enterprises in Algeria can conclude that there are a number of difficulties reflected in the low level of their performance, and thus directly affect their competitiveness, especially in light of the continuous openness of the Algerian market to global products in general and European products in particular, and these difficulties revolve around marketing, management, innovation, creativity, quality, financing and economic reforms, especially since this young sector is within a non-competitive macroeconomic environment. Despite Algeria's resort to supporting this sector with many programs and amendments, the most important of which is the national program for the rehabilitation of small and medium enterprises, and the development of some strategies to encourage investment in the small and medium enterprises sector, and the consecration of the spirit of entrepreneurship through a set of facilities, starting with the development of amendments at the legal level, improving the investment climate and creating an appropriate environment for this sector so that it is an effective driver of development and meeting the market's needs for various goods and services. In this context, we see that small and medium enterprises can form the basic foundation for the national export strategy due to the competitive strength they represent in global markets, which is confirmed year after year, which has led public authorities in many countries to pay attention to them and view them as a reserve resource for export.

Based on what has been mentioned and based on the importance of small and medium enterprises in developing and promoting Algerian exports outside the hydrocarbon sector, the problem of the study revolves around the following main question:

The main problem:

"To what extent do Algerian exports outside the hydrocarbon sector respond to the competitiveness of small and medium enterprises in Algeria during the period 2004-2022?"

The importance of the study:

- Testing the extent of the impact of the creation and establishment of small and medium enterprises on the promotion of non-oil exports and their role in the international market;
- Estimating the direct dynamic relationship between the development of the number of small and medium enterprises and the levels of non-hydrocarbon exports in Algeria.

Previous studies:

❖ Study BELKAID Brahim, BOUSSOUF Azzeddine Titled "**Econometric study of the impact of SMEs development on exports outside the hydrocarbon sector in 2010-2019** ," The study aimed to find the impact of small and medium enterprises on Algerian exports outside the hydrocarbon sector during the period from 2010 to 2019, through a quantitative study, where it concluded that there is a direct relationship between the development of the number of small and medium enterprises and exports outside the hydrocarbon sector in Algeria. (BELKAID & BOUSSOUF, 2022)

❖ A study entitled " **The impact of the growth and expansion of small and medium enterprises on the promotion of exports outside the hydrocarbon sector: an empirical study for the period 2002-2020** " Prepared by researcher Hussein Madan, and among the most important results reached is the lack of impact of the small and medium enterprises sector on promoting exports, as its activity is considered local. (MEDDANE, 2023)

A study entitled "**Small and Medium – sized Enterprises' Internationalization and the Influence of Importing on Exporting** " Prepared by: Maria Holmlund, Soren Kock and Vladimir Vanuyshyn 'The results of the survey of small and medium-sized enterprises in Finland indicate that the most important companies for starting the export process are those whose management is interested in the international market due to the limited domestic market, and experience is considered among the most important incentives for exporting almost. (Holmlund, Kock, & Vanuyshyn, 2007)

First: The theoretical aspect of the study

Through this aspect, the relationship between the development of small and medium enterprises and employment levels was highlighted, after presenting a comprehensive concept of this sector, highlighting its importance in creating jobs.

1. The concept of export competitiveness: The export process is considered a complex system with branches and ramifications, subject to constant changes due to interactions and integrations between international environments, due to the difference between local competitive environments and global competitive environments. Export competitiveness is the ability of a state or institution to produce goods and services that have the ability to compete in global markets. It can also be defined as “the extent to which a state or institution produces, under free and fair market conditions, products and services that compete in the global market”. (زيدى، 2007، ص 04) Through this definition, we can conclude that export competitiveness is a concept based on the foreign trade conditions of the country. It also expresses the ability of the sector or institution to produce goods and services, thanks to which it has a competitive position in the global market and to confront various global institutions that produce the same product or service.

2. Export competitiveness of S&M enterprises within the strategic analysis of: SWOT :The analytical dimensions of SWOT analysis are a comprehensive strategic view that combines the analysis of the external environment and the analysis of the internal environment of small and medium enterprises, which works to support the competitive position and gain the advantages of developing the enterprise's export competitiveness, as the results of the analysis of the internal environment can be used to benefit from it in achieving the strategy of developing and supporting export competitiveness, considering the diagnosis of strengths in order to support them, and weaknesses in order to eliminate them, and identifying threats to determine the mechanism for confronting them, and seizing available opportunities in order to exploit them in achieving the export competitiveness position. Examples of strengths, weaknesses, opportunities

and threats specific to small and medium enterprises are clear from the following table :

Table 1. Competitiveness of small and medium enterprises within the SWOT analysis

Weaknesses	Strengths
- Lack of skilled manpower and management and lack of equipment and technology. - Lack of global distribution channels and international marketing strategies.	- Flexibility in management and market entry. - Specialization in production and cost reduction.
Threats	Opportunities
-The control and monopoly of large corporations over global markets. -Increased fierce competition in light of the globalization of world trade.	- Moving from local to global competitiveness. - Internationalization of small and medium enterprises.

Source: Karsaklian, 2009, P100

It can be said that the examples shown above serve the strategic analysis process by translating them into mechanisms and means through which the strategic management of small and medium enterprises is determined, which it will adopt in order to reach export competitive advantages and improve the situation in order to exploit opportunities to penetrate foreign markets and increase export opportunities for small and medium enterprises.

Finally, we can conclude that despite the challenges facing small and medium enterprises in light of global integration, no one should deny that there are factors and opportunities available in light of this dynamic environment by encouraging and seizing these opportunities in moving from local competitiveness and moving towards global competitiveness by developing and upgrading the competitiveness of their exports.

3. The necessity of export marketing for small and medium enterprises: Export marketing plays a very important role in the internationalization of any economic institution that wishes to enter international markets, as this process goes through several stages, which are as follows : (Pasco-Berko, 2000, P 30)

3.1. The company's management is not interested in exporting: At this stage, there is no desire or interest on the part of the company's management to sell its products outside its local environment, either because the company is unable to cover its local market or its various capabilities, or the most important reason is the result of the unwillingness of the senior management to move towards an environment other than its local environment, despite the availability of all the conditions that help in the success of exporting its products.

3.2. Accepting a temporary external order: It happens that the institution receives a temporary external order that is not part of the institution's program, so it accepts to fulfill it without making any effort, whether in stimulating the receipt of other orders or offering its services in an intentional manner, and the export of its products ends with the completion of the provision of the order.

3.3. Rapid exploration of export possibilities: At this stage, the management of the institution begins to feel a kind of curiosity in exploring export, but in an unprofessional way, as it notices some possibilities of directing its products to the foreign market, without going to provide all means in order to make the orientation process successful, and this is also with the notes of approval that it may receive from the international consumer.

3.4. Exporting based on an experimental basis: where the institution exports its products, based on an experimental case without relying more on knowing the extent of the success of the experiment, where it places the possibilities of success and failure in the same row, and the process is like an experiment to hold the pulse for the possibility of integration in the event of confirmed success, and in order for the degree of risk to be less, it carries out this process for culturally similar countries .

3.5. Transforming the institution into an expert source for this country: After repeating export operations to a country, the institution becomes an expert in exporting its products to this country, and is able to penetrate it, avoid its risks, and also know the best available opportunities and potential threats.

3.6. Exporting to countries less culturally close to the home country:

At this stage, the company reaches the desire to export to other countries that are culturally distant from the home country, because this country has incentives that entice the company to overcome the environmental obstacles that hinder access to export in this country.

3.7. Moving towards internationality: At this stage, the institution reaches the status of an international company, at the level of promotion and distribution, where it has standards that are internationally accepted and challenged by other institutions.

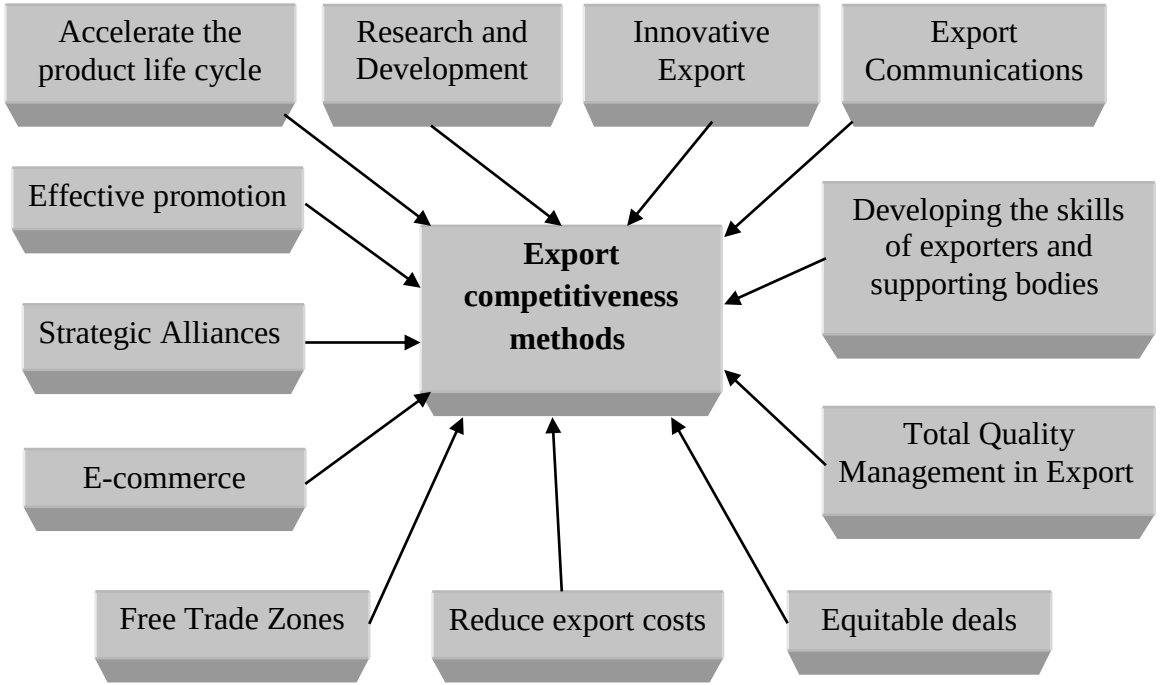
3.8. Strengthening regional integration procedures: The institution often reaches the international stage by adopting regional strategies for a specific bloc and working in it without directing its view to other markets, whether due to the characteristics of the company or the characteristics of its products, or the desire not to disperse its resources to more than one party, in order to control this market and face competition such as the European Union and the Arab Gulf market.

3.9. Strengthening the procedures for inclusiveness and unification of the global market: At this level, the organization is in a position where the largest part of its turnover is achieved through global markets, and it reaches the point of searching for standards that support inclusiveness and unification of characteristics and standards in the field of quality and product differentiation.

4. Mechanisms of export competitiveness: The survival, growth and expansion of institutions within the export market requires a set of mechanisms that form export competitiveness, the most important of which is represented in a set of operations that the institution must perform and which are related to either the institution's internal environment or its external environment.

The following figure shows us the most important export competitive mechanisms that create success in global markets.

Fig 1. Export competitiveness mechanisms



المصدر: (النجار، 2002، ص 111)

5. Indicators for measuring export competitiveness: In this context, we try to show the most important indicators that measure export competitiveness, since the export market is the best standard and test of competitiveness on the overall or partial level.

5.1. Revealed Comparative Advantage Indicator (R.C.A.I): The Revealed Comparative Advantage Indicator is measured by the following equation: (حسين شمت، 2010، ص 49)

$$RCAI = \frac{(x_{ij} \div X_{it})}{(x_{wj} \div X_{wt})}$$

x_{ij} : represents country (i)'s exports of commodity (j) to the world

X_{it} Expresses the total exports of the country (i)

x_{wj} World exports of commodity (j) represent

X_{wt} :Refers to the total value of world exports.

The significance of this indicator is that if a value greater than one is obtained, this indicates that this activity or export of this commodity enjoys a relative advantage, and vice versa, as it determines the relative advantage of the country towards the outside world.

5.2. Export Priority Indicated (E.P.I): The export priority index is measured by the following equation:

$$\text{E.P.I} = \frac{(L_i \oplus L_x)}{X} * 100\%$$

L_i : Value of imported supplies.

L_x : Value of local exportable supplies.

X : Export value of the commodity.

The higher this percentage is above 100%, the more it indicates a decrease in the importance of this commodity in increasing the country's foreign exchange earnings, and vice versa.

5.3. Market Penetration Indicator (M.P.I): This indicator measures the ability of a specific commodity to penetrate export markets and is measured by the following formula:

$$\text{M.P.I} = \frac{M_{ij}}{(Q_{ij} + M_{ij} - X_{ij})}$$

M_{ij} : Country (i) imports of commodity (j)

Q_{ij} : Production of commodity (j) in country (i)

X_{ij} : Exports of commodity (j) by country (i)

The higher the value of the market penetration index, the more acceptable the market is to the commodity in question, or the more capable it is of penetrating the market in question.

5.4. Growth Rate (GR): This indicator measures the growth of exports during two different periods or during a specific period of time and is measured by the following formula: (Adlmoulah & Laabas, 2013, P 106)

$$G_I = \left(\frac{X_{A2}}{X_{A1}} \right)^{(1/n-1)} \times 100$$

X_{A1} :Beginning of the period studied

X_{A2} :End of the period studied

n : Number of years

5.5. Export Centration (EC) Index: The index measures the degree of concentration of a country's commodity exports. This index was developed by (Hirschman) in 1958.

$$H_i = \sqrt{\sum (x_i \div X_t)^2}$$

x_i : Country exports of commodity (i)

X_t : Total exports of the country.

Its value ranges between (0) and (1), where value (1) means complete concentration of exports, i.e. the exporting country depends in its exports on a specific number of goods.

5.6. Intra-Industry trade (IIT) Integration Index: It measures the extent of integration of the country's exports with economic blocs and groups. The value ranges between (0) and (1), where the complete integration of commodity exports is at the value (1). It is measured by the following formula: (قاسم حسن و إسماعيل، 2012، ص 20)

$$III = 1 - \frac{\sum |X_i - M_i|}{\sum (X_i + M_i)}$$

X_i :The country's exports of commodity (I) to world markets.

M_i :The country's imports of commodity (I) from global markets.

5.7. Market share index of commodity exports in world markets: The market share index (MS) measures the share of a country's exports of a particular commodity in the markets out of the world's total imports of the same commodity. (قاسم حسن و إسماعيل، 2012، ص 22)

$$MS = \frac{X_i}{M_i}$$

X_i :Exports of the commodity (i) of the country to the target market.

M_i :Total market imports of commodity (i)

5.8. Export Conformity Index: It measures the extent to which a country's commodity exports are compatible and consistent with global demand in global markets. Its value ranges from 0 to 1, and complete conformity of commodity exports is at a value of 1.

$$COSINE = \frac{\sum X_{ik} M_{ik}}{\sqrt{\sum X_{ik}^2 \sum M_{ik}^2}}$$

X_{ik} :The country's exports of commodity (i) and (k) refers to the target market

M_{ik} :It is the imports from the target market of the commodity (i)

5.9. Export Diversity Index: It is expressed in the following formula:
(Arab Planning Institute, 2013, P127)

$$S_j = \frac{\sum |H_{ij} - H_i|}{2}$$

H_{ij} : Product share (i) in the country's total exports (j)

H_i :Product share of total world exports

Second: The applied (descriptive) aspect of the study

1. The definition of SMEs by the Algerian legislator: Algeria has made attempts to define small and medium enterprises, but these are unofficial definitions because it did not clearly define the boundaries between small and medium enterprises and other enterprises. However, after realizing the importance of these enterprises in driving the development locomotive, the Ministry of Small and Medium Enterprises developed a detailed official definition that came in a guiding law issued by the President of the

Republic in 2001. According to Law No. 01-18 dated Ramadan 27, 1422 corresponding to December 12, 2001, which includes the guiding law for the promotion of small and medium enterprises. (MPME, 2001)

Among the definitions included in the guiding law are the following : Small and medium enterprises, regardless of their legal nature, are defined as enterprises that produce goods and services, employ between 01 and 250 people, whose turnover does not exceed 02 billion dinars, and whose total annual revenue does not exceed 500 million dinars, and that meet the independence criterion.

2. The contribution of small and medium enterprises to the promotion of Algerian exports outside of hydrocarbons:

Table 2. Contribution of the development of small and medium enterprises to the promotion of non-oil exports (2004-2022)

Value of non-hydrocarbon exports (million dollars)	Total number of establishments S & M	Number of public institutions	Number of private S & M establishments	Years
781	312 959	778	312 181	2004
907	343 788	874	342 914	2005
1184	376 767	739	376 028	2006
1272	410 959	666	410 293	2007
1937	519 526	626	518 900	2008
1066	587 494	591	586 903	2009
1526	619 072	557	618 515	2010
2062	659 309	572	658 737	2011
2062	711 832	557	711 275	2012
2165	777 816	557	777 259	2013
2582	852 053	542	851 511	2014
1969	934 569	532	934 037	2015
1781	1 022 621	390	1 022 231	2016
1367	1 074 503	267	1 074 236	2017
2216	1 141 863	261	1 141 602	2018
2580	1 193 339	243	1 193 096	2019

Export competitiveness is the choice of SMEs to promote Algerian exports.

2255	1 231 073	229	1 230 844	2020
4578	1 286 365	225	1 286 140	2021
5977	1 359 803	223	1 359 580	2022

Source: (MIPP, 2023)

From the table above, it is noted that there is a significant development in the total number of small and medium enterprises affiliated with the private sector, where in 2004 their number was 312,181 private enterprises, to become in 2022: 1,359,580 private enterprises. This development was the result of the policy pursued by the government, which is represented by the interest and development of this young sector and giving the initiative to the private sector, which it considered the locomotive of economic growth through Law No. 01-18 dated Ramadan 27, 1422 corresponding to December 12, 2001, which includes the guiding law for the promotion of small and medium enterprises. It came to fill the legal vacuum towards small and medium enterprises, as well as to establish the culture of the enterprise and work to consolidate it within society by intensifying the institutional and industrial fabric in order to create wealth and provide jobs. The law generally stipulates the inclusion of the development of SMEs within the dynamics of technological development and adaptation, encouraging the competitiveness of small and medium enterprises and improving their performance, and developing programs to qualify small and medium enterprises in order to develop the competitiveness of enterprises with the aim of upgrading the national product to meet international standards. This law gave a strong impetus that contributed to the development and growth of this young sector. However, public institutions experienced a decline as a result of the privatization policy adopted by the state and giving the initiative to the private sector.

Third: The standard aspect of the study

1. Model Description:

1.1. The direction of the relationship between the study variables according to the economic theory: Based on what we previously discussed in the theoretical and analytical aspect regarding the development of small and medium enterprises and their role in developing exports

outside the hydrocarbon sector, we conclude the direction of the relationship between the variables under study as follows:

✓ There is a direct (positive) relationship between small and medium enterprises and the value of exports outside of hydrocarbons.

1.2. Standard Model Description: It means formulating the economic relationship between the variables under study in its mathematical form with the aim of simplifying the relationship between the variables and measuring their coefficients based on standard methods. In our study, we rely on the value of exports outside of hydrocarbons as a dependent variable, while public and private small and medium enterprises as independent variables .

The standard model can then be formulated considering non-hydrocarbon exports as a function of the small and medium enterprises as follows:

$$EX = f(PR; PP).....(01)$$

EX :Export value ‘ **PR :**Number of small and medium enterprises in the private sector ‘ **PP :**Number of small and medium enterprises in the public sector

2. Autoregressive Distributed Lag (ARDL) Model Methodology: The ARDL method is a modern method introduced by Pesaran et al in 2001, through which the integral relationship of the dependent variable (Y) with the independent variables (X) can be determined in the long and short run according to the following mathematical formula:

$$\Delta Y_t = \alpha_0 + \alpha_1 X_{t-1} + \alpha_2 Y_{t-1} + \sum_{i=0}^{k1} \beta_1 \Delta X_{t-i} + \sum_{i=1}^{k2} \beta_2 \Delta Y_{t-i} + e_t$$

The most important features and characteristics of the ARDL methodology over other estimation methods are : (Pesaran, Shin, & J.Smith, 2001, P 289)

- ✓ It combines variables that are stable at I(0) and I(1) and they do not all have to be stable at the same level such as I(0) or I(1)
- ✓ Estimates the model parameters in the long and short term in the same equation;
- ✓ It removes the problems of autocorrelation, so its results are efficient and unbiased .

Among the most important steps that must be followed according to the ARDL methodology are:

- A. Testing the stationarity of time series and ensuring that they are all stationary at degree I (0) or degree I (1)
- B. Determine appropriate slowdown periods.
- C. Testing for cointegration using bounds tests
- D. Estimation of the model in the long and short term
- E. Conduct post-tests to diagnose the quality of the model.

3. The Econometric Study:

3.1. Testing the stationarity of time series (Dickey-Fuller unit root test): A time series is stationary if its values fluctuate around a constant arithmetic mean and a variance independent of time. To test the stationarity of the time series of the model variables in terms of (single root), this requires the unit root test (DF), the augmented Dickey-Fuller (ADF), and the Philip Perron test (PP), as these tests prove the nature and characteristics of the time series of the variables under study. (Borbonais & Terraza, 2004, PP 150-152)

Table 3. Unit root test according to ADF test

UNIT ROOT TEST RESULTS TABLE (ADF)				
Null Hypothesis: the variable has a unit root				
	At Level			
		EX	PR	PR
With Constant	t-Statistic	0.8295	0.7857	0.7857
	Prob.	0.9915	0.9906	0.9906
		n0	n0	n0
With Constant & Trend	t-Statistic	-0.3839	-3.2101	-3.2101
	Prob.	0.9796	0.1153	0.1153
		n0	n0	n0
Without Constant & Trend	t-Statistic	1.8852	1.7190	1.7190
	Prob.	0.9813	0.9738	0.9738
		n0	n0	n0
	At First Difference			
		d(EX)	d(PR)	d(PR)
With Constant	t-Statistic	-3.3534	-3.1328	-3.1328
	Prob.	0.0283	0.0430	0.0430
		**	**	**
With Constant & Trend	t-Statistic	-3.7178	-3.0463	-3.0463
	Prob.	0.0494	0.1492	0.1492

		**	n0	n0
Without Constant & Trend	t-Statistic	-2.9794	-0.5356	-0.5356
	Prob.	0.0054	0.4697	0.4697
		***	n0	n0

Source: Prepared by researchers based on the outputs of (Eviews 9)

From the above table, we notice that all variables are not stationary at degree (0)I, but they are stationary at the first difference, and thus these results allow the use of the ARDL methodology.

Table 4. Unit root test according to PP test

UNIT ROOT TEST RESULTS TABLE (PP)				
Null Hypothesis: the variable has a unit root				
	At Level			
		EX	PR	PP
With Constant	t-Statistic	1.2282	0.7242	-0.6117
	Prob.	0.9969	0.9891	0.8448
		n0	n0	n0
With Constant & Trend	t-Statistic	-0.3839	-2.7568	-2.2560
	Prob.	0.9796	0.2284	0.4341
		n0	n0	n0
Without Constant & Trend	t-Statistic	2.1454	6.0013	-2.3643
	Prob.	0.9889	1.0000	0.0212
		n0	n0	**
	At First Difference			
		d(EX)	d(PR)	d(PP)
With Constant	t-Statistic	-3.3548	-3.5045	-4.4356
	Prob.	0.0283	0.0212	0.0034
		**	**	***
With Constant & Trend	t-Statistic	-3.7129	-3.2303	-4.4260
	Prob.	0.0498	0.1116	0.0141
		**	n0	**
Without Constant & Trend	t-Statistic	-2.9794	-0.0952	-3.2452
	Prob.	0.0054	0.6364	0.0029
		***	n0	***

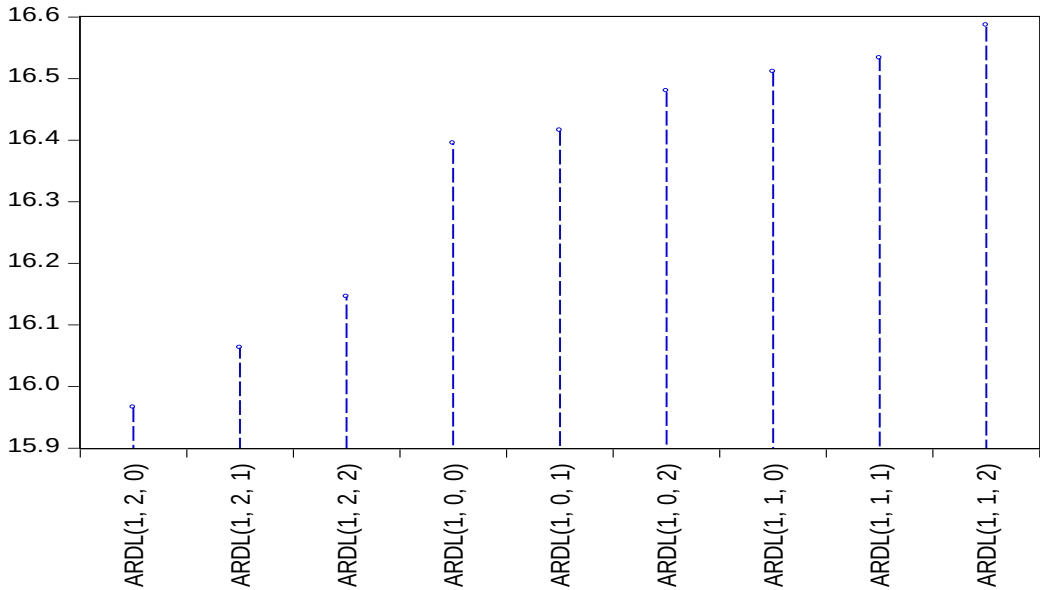
Source: Prepared by researchers based on the outputs of (Eviews 9)

From the above table, which studies the stationarity of the study variables according to the PP test, it is clear that all the series are not stable at the level except for the series for public small and medium enterprises without a trend, but they are all stable at the first difference, and accordingly we can test the existence of a long-term relationship between

the aforementioned variables, as this test largely confirms the results of the ADF test.

3.2. Determining the optimal lag period for the model: Before estimating the relationship in the short and long term according to the ARDL methodology between the study variables, it is necessary to know the optimal lag periods for these variables according to the Akaike criterion values. According to Figure N° 02, the optimal lag period is (1, 2, 0) for the variables according to the sequence as shown in the figure below:

Fig 2. Optimal lag periods according to Akaike's criterion for the ARDL model
Akaike Information Criteria



Source: Prepared by researchers based on the outputs of (Eviews 9) 4-

4. Cointegration test according to Bounds Test: The ARDL model for the study variables is written as follows:

$$\Delta EX_t = c + \alpha_1 EX_{t-1} + \alpha_2 PR_{t-1} + \alpha_3 PP_{t-1} + \sum_{i=1}^k \beta_{1,i} \Delta EX_{t-i} + \sum_{i=0}^{k1} \beta_{2,i} \Delta PR_{t-i} + \sum_{i=0}^{k2} \beta_{3,i} \Delta PP_{t-i} + e_t$$

Where each of them represents :

($\alpha_1; \alpha_2; \alpha_3$) The parameters of the independent variables in the long period are represented, while ($\beta_{1,i}; \beta_{2,i}; \beta_{3,i}$) The parameters of the independent

variables in the short period, (c) the constant term, (et) the random error term (Δ) ,Refers to first-order differences.

To test the extent of the existence of a long-term equilibrium relationship (the existence of joint integration) between non-oil exports and the development of the number of small and medium enterprises according to the ARDL model, the null hypothesis (H0) stating that there is no joint integration between the model variables and the alternative hypothesis (H1) stating that there is joint integration between the model variables must be tested, which can be formulated as follows:

$$\begin{cases} H_0 : \alpha_1 = \alpha_2 = \alpha_3 = 0 \\ H_1 : \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq 0 \end{cases}$$

To conduct the cointegration test using the bounds test based on Fisher's F-Statistics as shown in the table below:

Table 5. Results of the joint integration test of the model according to the limits test

ARDL Bounds Test

Date: 06/08/24 Time: 15:15

Sample: 2006 2022

Included observations: 17

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	3.939456	2

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.63	3.35
5%	3.1	3.87
2.5%	3.55	4.38
1%	4.13	5

Source: Prepared by researchers based on the outputs of (Eviews 9)

It is noted from the table that the value of Fisher's F-Statistics is greater than the critical value of the upper limit at a significance level of (5%), which means rejecting the null hypothesis (H0) and accepting the alternative hypothesis (H1). This means the existence of a joint integration

relationship between the explanatory variables in the model, i.e. the existence of a long-term equilibrium relationship.

4.1. Results of estimating the model parameters in the short and long run according to the ARDL methodology: After confirming the existence of a long-term equilibrium relationship according to the bounds test, the parameters in the short and long runs and the error correction parameter (ECM) should be estimated.

Table 6. Estimation of the ECM error correction model in the short run

ARDL Cointegrating And Long Run Form

Dependent Variable: EX

Selected Model: ARDL(1, 2, 0)

Date: 06/08/24 Time: 15:18

Sample: 2004 2022

Included observations: 17

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PR)	0.005482	0.007729	0.709215	0.4929
D(PR(-1))	-0.023593	0.007337	-3.215765	0.0082
D(PP)	-1.506554	4.161795	-0.361996	0.7242
CointEq(-1)	-1.503945	0.309234	-0.022460	0.0025
Cointeq = EX - (0.0500*PR -216.9110*PP + 251176.1260)				

Source: Prepared by researchers based on the outputs of (Eviews 9)

From the table, we notice that the calculated Student statistic shows us that the variable parameter of public and private institutions in the short-term model has statistical significance at a significance level of 5%. As for the return coefficient, or what is called the error correction coefficient, it has statistical significance and has a negative sign (-1.5039), where the negative sign shows the convergence of equilibrium from the short term to equilibrium in the long term. This means that (150%) of the short-term errors are automatically corrected over time to reach equilibrium in the long term.

Table 7. Estimation of parameters in the long term

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PR	0.730381	1.992817	0.025081	0.0004
PP	0.040986	9985.443139	-0.021723	0.0031
C	251176.125	11473057.0	0.021893	0.9829

Source: Prepared by researchers based on the outputs of (Eviews 9)

The table shows the following:

- For public and private enterprises, there is a direct relationship between them and non-hydrocarbon exports in the long run because it is statistically significant at the 5% level.
- The sign of the variable coefficient of private SMEs is positive and statistically significant at the 5% level, indicating the existence of a direct relationship between private SMEs and exports outside the hydrocarbon sector. This sign is consistent with the economic theory, as the value of this coefficient reached (0.7303) and can be interpreted as every increase in the number of private SMEs by 1% leads to an increase in exports by 0.73%.

5. Model quality tests (standard evaluation): To ensure the quality of the model, it is necessary to address the diagnostic tests as shown in the following table:

5.1. Breusch-Godfrey Serial Correlation Test

Table 8. Serial autocorrelation test between residuals

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.272436	Prob. F(2,9)	0.3261
Obs*R-squared	3.747363	Prob. Chi-Square(2)	0.1536

Source: Prepared by researchers based on the outputs of (Eviews 9)

Table.8 shows that the probability value (prob=0.1536) is greater than the 5% significance level, which indicates the acceptance of the null hypothesis that assumes the estimated model is free of autocorrelation of the residuals.

5.2. Heteroskedasticity Test ARCH:

Table 9. Test of non-invariance of variance for model residuals

Heteroskedasticity Test: ARCH

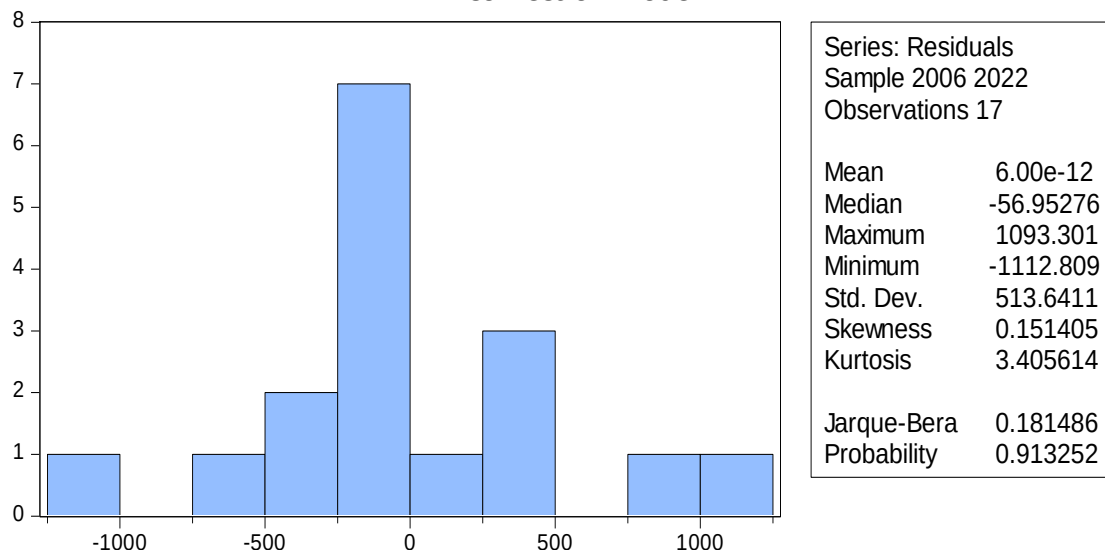
F-statistic	1.759424	Prob. F(1,14)	0.2059
Obs*R-squared	1.786283	Prob. Chi-Square(1)	0.1814

Source: Prepared by researchers based on the outputs of (Eviews 9)

Table.9 shows that the probability value (prob=0.1814) is greater than the 5% significance level, which indicates the acceptance of the null hypothesis that states the homogeneity of the error limits variance, as shown in the table above.

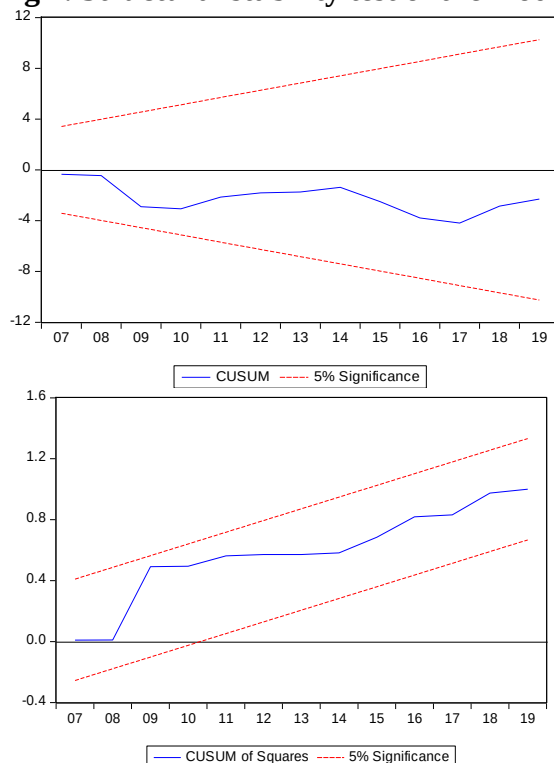
5.3. Testing the normal distribution condition for the residuals of the error correction model Normality Test Jarque-Bera: From the figure and data below, we notice that the test value ($J - B = 0.1814$) with a probability (prob = 0.9132) is greater than the 5% level, which is an insignificant result, so we reject the null hypothesis and accept the alternative hypothesis, which states that the residuals of the estimated model follow the normal distribution.

Fig 3. Testing the normal distribution condition for the residuals of the error correction model



Source: Prepared by researchers based on the outputs of (Eviews 9)

5.4. Structural stability test of the CUSUM, CUSUMSQ model:

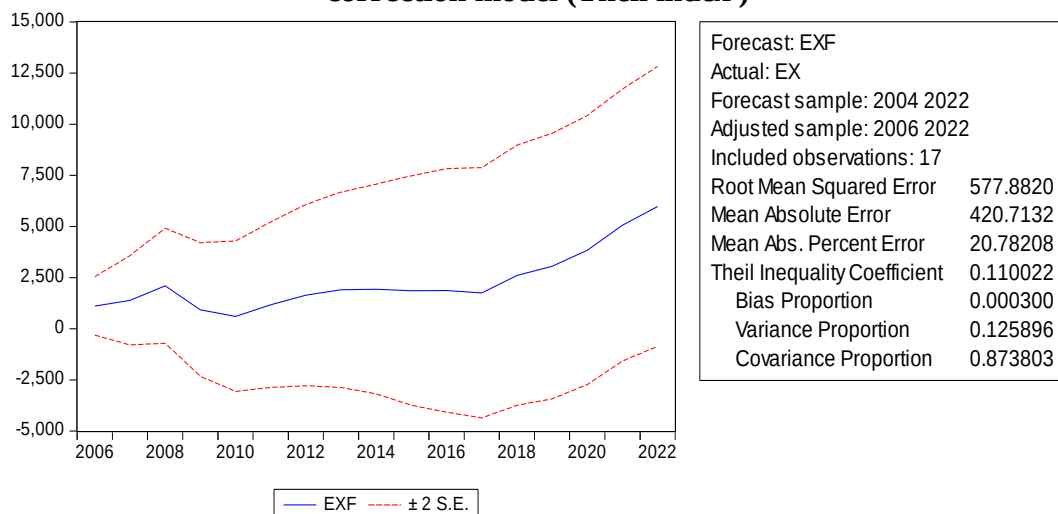
Fig 4. Structural stability test of the model

Source: Prepared by researchers based on the outputs of (Eviews 9)

As for the results of the structural stability test for the CUSUM and CUSUMSQ coefficients, it is clear that the coefficients of the cumulative sum test of the residuals are within the limits, which confirms that the model is stable as in the figure above, i.e. there is no structural change during the studied time period, which indicates consistency and stability between the long-term results and the short-term results of the estimated model. Accordingly, we can conclude that the functional relationship between the output and the independent variables is a stable functional relationship, and the national output can be used as a target variable.

5.5. Testing the quality of the predictive performance of the unconstrained error correction model (Theil index): In order to verify that the estimated model during the studied period is characterized by high quality in prediction, the Theil test coefficient is used, as shown in the figure below :

Fig 5. Testing the predictive performance quality of the unconstrained error correction model (Theil index)



Source: Prepared by researchers based on the outputs of (Eviews 9)

The results shown in the figure above indicate that the value of the coefficient of inequality for: Theil is equal to (0.110022), which is a value close to the standard value for: Theil, which is zero, while the value of variance reached (0.8738), which is a value close to the correct one. Accordingly, it can be said that the model is suitable for predicting economic growth and can be used to explain the dynamics of increasing national output in Algeria during the study period, and the model has a high predictive ability.

CONCLUSION

From what was previously discussed in the theoretical aspect of the study, which included the impact and importance of the competitiveness of small and medium enterprises in promoting Algerian exports, as well as the applied aspect through which a standard study was conducted that aimed to find the relationship between the development of the number of small and medium enterprises in both the public and private sectors during the period (2004-2022), using the autoregressive model for distributed time lags (ARDL methodology), by using the program (Eviews 09), and in order to achieve the goal of the study, the value of exports outside the hydrocarbon sector in Algeria was used as a dependent function in the number of small and medium enterprises in both the private and public sectors as

independent and influential variables, where a set of results and recommendations were reached that can be summarized as follows:

- ❖ Small and medium enterprises play an important role in the national economy and their contribution to the Algerian GDP;
- ❖ Algeria has programmed several policies and strategies to promote the small and medium enterprises sector, the most important of which is the policy of support directed especially to private individuals within the guiding law for the promotion of small and medium enterprises 2001;
- ❖ In general, there is a significant development in the number of private small and medium enterprises, especially after the great interest shown by the Algerian government in this sector in recent years;
- ❖ Algerian exports outside the hydrocarbon sector are still weak and marginal compared to the value of hydrocarbon exports;
- ❖ From the standard aspect, the study has proven the existence of a long-term relationship between the dependent variable represented by exports outside the hydrocarbon sector and the variables that explain it and are expressed by the number of small and medium enterprises in Algeria in the private and public sectors. This is consistent with economic theory.
- ❖ The study also proved the existence of joint integration between the study variables through the bound test approach for joint integration, so the model reached shows that there is a long-term equilibrium relationship. The model parameters, whether in the short or long period, are statistically significant;
- ❖ As for the quality of the model, diagnostic tests (or post-tests of the model) proved the quality of the model and its use in the prediction process.

Based on the above and what has been discussed, a number of recommendations can be made, including:

- Adopting a long-term strategy based on building an economy based on the competitiveness of economic institutions to confront fierce competition from foreign institutions, and reconsidering the existing economic model that is primarily based on oil rents by focusing on a strategy to establish economic diversification;
- Paying great attention to the issue of competitiveness by developing programs and mechanisms and establishing agencies specifically to

encourage and adopt the dimensions of competitiveness within the development of technical programs that contribute to spreading interest in this topic, and instilling a new organizational culture that is in line with comprehensive quality management, a culture that adopts continuous improvement in all its work, and improving the personnel of the workers with the importance of that, by encouraging and preparing the necessary programs for that within the small and medium enterprises sector.

➤ The necessity of opening up prospects for cooperation between Algerian small and medium enterprises and foreign institutions, to benefit from technical and financial support, improve performance and competitive superiority, and establish global alliances in order to discover foreign markets within the framework of foreign partnership.

➤ Providing all facilities and incentives to small and medium enterprises through appropriate legislation such as preventing monopoly by large companies, legislation preventing dumping by some foreign companies, and enacting laws based on encouraging competition and combating parallel markets, for example. Data must also be provided or information banks must be established for Algerian institutions to identify foreign markets, and incentives must be provided to participate in international exhibitions. The necessary technical and financial privileges must also be granted to encourage the ability to increase and improve production quality and reduce costs, and the necessity of preferential treatment for local products.

Bibliography List :

- Adlmoulah, W., & Laabas, B. (2013). Assesment of arabe export competitiveness in international markets using trad indicators. *journal of development and economic policies*, 15(2).
- Arab Planning Institute. (2013). *Arab Development Report*. Consulté le 10 11, 2024, sur Arab Planning Institute:
www.arab-api.org/Files/Publications/PDF/406/406_Arabic-development-report2014.pdf
- BELKAID, B., & BOUSSOUF, A. (2022). Econometric study of the impact of SMEs development on exports outside the hydrocarbon sector in 2010-2019. *Journal of Financial, Accounting and Managerial Studies*, 9(2).

- Borbonais, R., & Terraza, M. (2004). *L'analyse des séries temporelles en économie* (éd. 1). Paris, France: DUNOD.
- Holmlund, M., Kock, S., & Vanuyshyn, V. (2007). Small and Medium – sized Enterprises' Internationalization and the Influence of Importing on Exporting. *International Small Business Journal*, 25(5).
- Karsaklian, E. (2009). *Internationalisation d'entreprise*. Paris, France: Edition Dunod.
- MEDDANE, H. (2023). The impact of the growth and increase of small and medium enterprises on the promotion of non-hydrocarbon exports, an econometric study for the period 2002-2020. *Abaad Iktissadia Review*, 13(2).
- MIPP. (2023). *Bulletin d'information statistique de la PME*. Consulté le 10 11, 2024, sur Ministère de l'Industrie et de la Production Pharmaceutique: <https://www.industrie.gov.dz/>
- MPME. (2001, 12 12). *Loi n° 01-18: d'orientation sur la promotion de la petite et moyenne entreprise*. Consulté le 10 11, 2024, sur Secrétariat Général du Gouvernement Algérie:
<https://www.joradp.dz/FTP/jo-francais/2001/F2001077.pdf#page=4>
- Pasco-Berko, C. (2000). *Marketing International* (éd. 3). Paris, France: Dunod.
- Pesaran, M., Shin, Y., & J.Smith, R. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, 16(3).
- جمال قاسم حسن، و محمد إسماعيل. (2012). *تنافسية الصادرات السلعية في الدول العربية*. تاريخ الاسترداد 10 09 2024، من صندوق النقد الدولي:
www.amf.org.ae/sites/default/files/publications/2021-12/competitiveness-merchandise-exports-arab-countries.pdf
- فريد النجار. (2002). *تسويق الصادرات العربية*. القاهرة، مصر: دار قباء للطباعة والنشر.
- نيفين حسين شمت. (2010). *التنافسية الدولية وتأثيرها على التجارة العربية والعالمية*. مصر: دار التعليم الجامعي.