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Small and medium-sized enterprises in Algeria. Are they fulfilling their assigned role?

An Empirical Study for the Period 2001-2022

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ABSTRACT:

This study aims to highlight the role of small and medium-sized enterprises (SMEs) in local economic development in Algeria by examining their participation in the economic process. The study addresses a range of indicators, starting with their number, then the number of jobs they provide, their exports, and specifically their contribution to the gross domestic product (GDP). The study analyzed data from 2001 to 2022, employing a cointegration methodology using the Autoregressive Distributed Lag Period (ARDL) model.

The key findings of the study are as follows: The Bounds Test robustly confirms the existence of a strong long-run cointegrating relationship among the variables, which is further validated by the significant error correction term, indicating that approximately 22% of short-run disequilibrium is corrected annually. In the short run, exports emerge as the most powerful and statistically significant driver of growth, whereas variables related to small and medium-sized enterprises exhibit no substantial impact in either the short or long term. These results suggest that the stimulative effect of exports is confined to the short run, underscoring the need to reassess policies aimed at supporting small and medium-sized enterprises to enhance their effectiveness.

.**Keywords:**Small and medium enterprises, Gross domestic product,Economic development, ARDL model.
Jel: H69, C1, C29.

1. Introduction:

Promoting entrepreneurship is a key element for achieving economic growth, and it is a primary objective for governments around the world.(Jayeola et al., 2022)There is strong consensus at both the political and academic levels regarding the importance of small and

medium-sized enterprises (SMEs) in achieving economic development, and the need to understand the factors that contribute to their growth.(Keen et al., 2022)

Small and medium-sized enterprises (SMEs) are fundamental pillars of any country's national economy, whether developed or developing. They contribute significantly to economic growth, job creation, innovation, and balanced regional development. These businesses are characterized by their high adaptability and resilience to economic changes, making them a vital engine for sustainable development. In light of the growing economic challenges facing the world, supporting and developing SMEs has become increasingly important as an effective tool for achieving inclusive economic development, reducing poverty, and raising living standards. Therefore, it is essential to study the role of SMEs and understand the mechanisms for empowering them in order to enhance their contribution to the national economy in the long term.

This article addresses the issue of the contribution of small and medium-sized enterprises (SMEs) to economic development through a set of indicators, starting with the number of these enterprises, in addition to the number of jobs they create, and finally the value of SME exports. All of these indicators will be studied to determine the extent to which they contribute to changes in gross domestic product (GDP) in AlgeriaIn order to answer the question :

Do small and medium-sized enterprises (SMEs) in Algeria contribute to economic development?

The hypotheses of the study are as follows:

H1**:** Increasing the number of small and medium enterprises contributes to improving the level of gross domestic product.;

H2**:** Jobs created by small and medium-sized enterprises contribute to increasing the level of gross domestic product.

H3**:** The value of exports from small and medium enterprises contributes to increasing the gross domestic product.

2. Theoretical background

2.1 Definition of SME.

There are differing views among international development organizations regarding the definition of small and medium-sized enterprises (SMEs).According to J.E. Bolton, small businesses are defined by three criteria: first, they have a small market share; second, they are personally managed by their owners or part owners, rather than through a formal management structure; and finally, they are independent and not tied to a larger corporation, allowing owners and managers to make decisions without external control.(Khellil & Loucif, 2024) SMEs are, definition, by a category of businesses that fall between very small businesses and large corporations. While this categorization is generally clear, there is considerable variation in the size of businesses that are considered to be SMEs.(Poole, 2018)

The European Commission defines small, medium-sized, and large enterprises based on the following criteria: number of employees, annual sales volume, and annual budget.In its 2003 recommendation, the European Commission provided a definition of small and medium-sized enterprises (SMEs) in Europe. The key criteria state that these enterprises must have fewer than 250 employees, a turnover of less than €50 million, or a total asset value of less than €43 million. According to these criteria, SMEs represent 99% of all businesses in Europe. These enterprises are the backbone of the European economy and contribute significantly to job creation and value added.(Kaya, 2022)in AlgeriaArticle 8 of the same Law No. 17-02 defined a medium-sized enterprise as “an enterprise employing between 50 and 250 workers and whose turnover is limited to between 400 million and 4 billion Algerian dinars, or whose

total annual income is between 200 million and 1 billion Algerian dinars(Mechaali & Mahrez, 2019).

The contribution of small and medium-sized enterprises to the economy can generally be summarized in five key points: job creation; rapid adaptation to new situations thanks to their flexibility; fostering an entrepreneurial spirit; enhancing product quality through superior production; and their role as a supporting sector within larger companies.(Erdin & Ozkaya, 2020)Small and medium-sized enterprises contribute significantly to GDP. Their contribution to job creation, poverty reduction, and other areas helps foster balanced economic growth, and they also contribute to reducing crime rates by providing employment opportunities for the unemployed.(Ayandibu & Houghton, 2017)

2.2Importance of SMEs:

Studies recognize the powerful impact of small and medium-sized enterprises (SMEs) on the global economy and the importance of their contribution to achieving the Sustainable Development Goals.(Smith et al., 2022)The concept of SME development and entrepreneurship was introduced into the growth and development landscape as early as the late 1940s with the introduction of targeted policies (grants, subsidized credits, special tax treatment, etc.) and the creation of support for small businesses or SMEs.(Ayandibu & Houghton, 2017).According to the World Bank, small and medium enterprises contribute to the economy in the following ways:

- SMEs are the engine of growth;
- SMEs are essential for a competitive and efficient market;
- 3.SMEs are critical for poverty reduction;
- SMEs play a particularly important role in developing countries.

This is consistent with what Vermeulen, 2011, stated in his research paper that addressed the importance of the small and medium enterprises sector.(Ayandibu & Houghton, 2017)

Small and medium-sized enterprises (SMEs) have long played a significant role in the global economy. They are the engine of economic growth and have a profound impact on economic activity. The following table illustrates the relative importance of SMEs in selected countries.(Ayandibu & Houghton, 2017)

2.3 . EconomicDevelopment

In purely economic terms, development has traditionally meant achieving sustainable growth rates in per capita income to enable a country to expand its production at a rate faster than its population growth. Levels and growth rates of real per capita gross national income (GNI) (money growth in per capita GNI minus the inflation rate) are then used to measure the overall economic well-being of a population—that is, the amount of real goods and services available to the average citizen for consumption and investment.(Todaro & Smith, 2012)

3. Literature Review

A number of studies have addressed the contribution of small and medium enterprises to the economic process from different aspects. The study of (Bouchikhi & Sadouki , The impact of the establishment of small and medium enterprises on Algerian exports outside the hydrocarbon sector, 2018) entitled “The impact of the establishment of small and medium enterprises on Algerian exports outside the hydrocarbon sector ” highlights the impact of the development of small and medium enterprises on non-hydrocarbon exports. The study covered the period between 2001 and 2016, and concluded that there is a direct relationship between the increase in the number of small and medium enterprises and the increase in the volume of non-hydrocarbon exports.

On the other hand,the study of (MECHAALI & MAHREZ, 2020) , titled "The role of Small & Medium Enterprises (SMEs) in economic development: the Algerian experience" addressed the reality of small and medium-sized enterprises (SMEs) and their contribution to

economic development in Algeria, where this type of company is considered the main engine of economic development globally. The study's findings showed that despite the efforts made by the Algerian state to develop SMEs, the results remain weak, and the contribution of this type of company to economic development, particularly in the areas of employment, exports, GDP, and added value, has not been fully realized. This necessitates intensifying efforts and developing a new strategy that enhances their ability to face challenges and overcome difficulties related to financing, technology, and marketing.

In addition, a study by (rekrak, labsi, & sellali, 2022)indicated the contribution of small and medium enterprises to economic growth in Algeria during the period from 2001 to 2018, based on the multiple regression model to determine the nature of the relationship between a set of variables (number of enterprises established, number of jobs created, unemployment rate) and economic growth. The study concluded that there is a statistically significant positive relationship between the number of small and medium enterprises established, the jobs they created and economic growth, and also an inverse relationship between unemployment rates and economic growth at the same time.

The study by (meddane, 2023) presented a model for studying the impact of the growth and increase of small and medium enterprises on the promotion of non-hydrocarbon exports, concluding that the small and medium enterprises sector has an impact on promoting non-hydrocarbon exports.

Conversely, the study (Elmihoub & Belkhir, 2024)entitled The Impact of Increasing the Number of Small and Medium Enterprises on the Promotion of Non-Hydrocarbon Exports in Algeria proved that the index of development of small and medium enterprises has a significant impact in the long term, and that the regression coefficient is positive, which indicates a direct relationship between the development and growth of small and medium enterprises and the increase in non-oil exports.

Although most studies, including the current study, focus on the number of establishments index, the number of newly created jobs index, and the exports index, the methods used to address the topic of small and medium enterprises differed in the previous studies referred to, particularly in the fact that most of these studies relied on the multiple regression model. Also, the period used in this study is relatively recent compared to previous studies.

3. Data and Methodology

3.1 Methods.

This article relies on the descriptive approach, and the data was analyzed using the Eviews program. This data was collected from publications of the Algerian Ministry of Industry, which is responsible for the small and medium-sized enterprises sector. Data from the World Bank was also used.The cointegration methodology was also employed using the Autoregressive Distributed Lag (ARDL) approach.

3.2 Data

Study model and determining variables:

Table 1:*Determinationof Variables*

The variable	***The Symbol***	***Unit of Measurement***	***Source***
GrossDomestic Product	*GDP*	*Billiondollars (USD)*	*World Bank*
Number ofSMEs	*N SMEs*	*Number*	*Ministry of Industry Statistics*
Number of jobs Created	*Job SMEs*	*Number*	*Ministry of Industry Statistics*
ExportsofSMEs	*EXPO*	*Million dollars (USD)*	*Ministry of Industry Statistics*

Source:Based on the collected data.

In the analytical study, a set of indicators was selected to represent the study variables. In the field of economic development, we relied on the GDP indicator expressed in billion US dollars, and this indicator represents the dependent variable. As for the independent variables, the number of small and medium-sized enterprises was chosen during the period from 2001 to 2022. The second variable is the number of jobs created by small and medium-sized enterprises. Finally, The third variable represents the value of exports of small and medium-sized enterprises expressed in million dollars.

Table 2 :*Data related to variables.*

YEAR	GDP	N SMEs	Job SMEs	EXPO
2001	59,41	245 348	737 062	19 132
2002	61,52	261 853	684 341	18 825
2003	73,48	288 587	704 999	24 612
2004	91,91	226 227	838 504	32 083
2005	107,05	342 788	838 504	45 036
2006	123,08	376 767	1 252 647	54 613
2007	142,48	294 612	1 355 399	60 163
2008	180,38	519 526	1 540 209	79 298
2009	150,32	455 989	1 756 964	45 194
2010	177,79	619 072	1 625 686	57 053
2011	218,33	659 309	1 724 197	73 489
2012	227,14	711 832	1 776 461	71 866
2013	229,70	747 934	2 001 892	65 917
2014	238,94	852 053	2 157 232	62 886
2015	187,49	896 811	2 238 233	37 787
2016	180,76	1 022 621	2 487 914	13 323
2017	189,88	1 060 289	2 601 958	18 141
2018	194,55	1 141 863	2 690 246	41 797
2019	193,46	1 193 339	2 885 654	35 824
2020	164,87	1 231 073	2 989 516	23 797
2021	186,23	1 286 365	3 134 968	39 281
2022	225,64	1 359 803	3 307 821	60 384

Source : From various sources.

The previous table represents data for the variables from 2001 to 2022. To explain the development of this data during the period, we will rely on the curves for each variable separately.

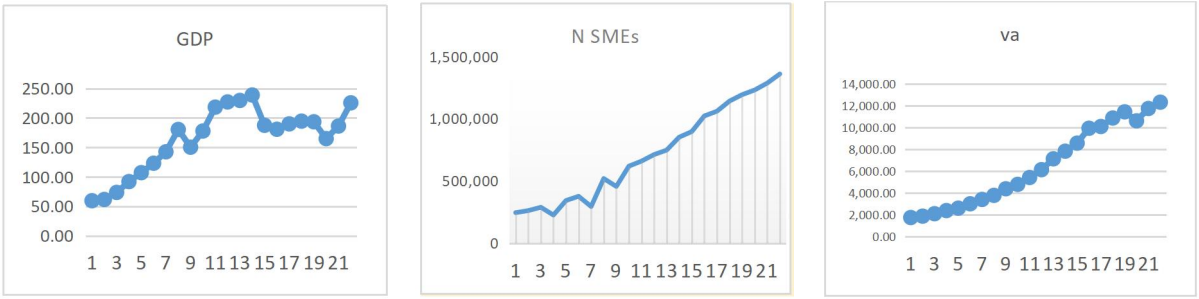
3-3. Evolution of Study Variables

The following figures illustrate the evolution of key economic indicators related to small and medium-sized enterprises (SMEs). They provide a graphical representation of trends in GDP, the number of enterprises, their added value, and the employment opportunities they provide over the specified period. This data forms the basis for analyzing the performance and impact of the SME sector.

Figure1 :*Evolution of the value of gross domestic product.*

Figure2 :*Evolution of the number of small and medium enterprises.*

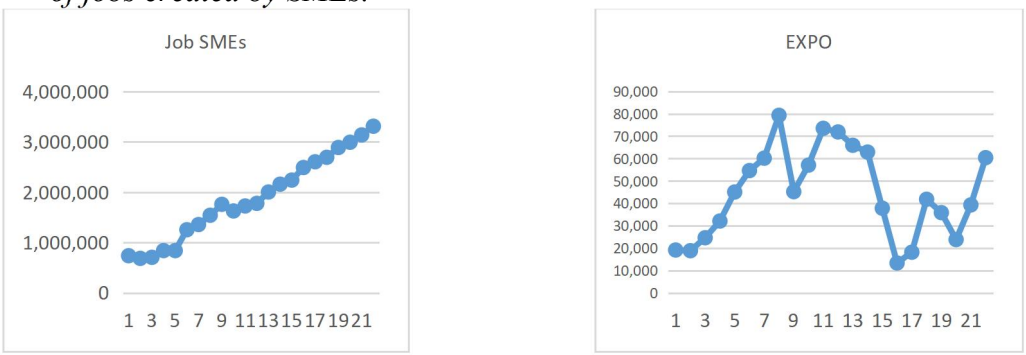
Figure3 *: Development of added value for small and medium enterprises.*



Source :*Based on the data in Table No.Based on the data in Table No.2*

Figure 4 :*The development of the number of jobs created by SMEs.*

Figure5 *: Development of exports of SMEs.*



Source :*Based on the data in Table No.Based on the data in Table No.2*

From the figure 1, we notice that the gross domestic product fluctuated during the period from 2001 to the year 2022. The development of this variable increased from the year 2001 to the year 2008, when at the beginning of the period it was estimated at 59.41 billion dollars, reaching at the end of the year 2008 to 180.38 billion dollars.

These values indicate that the change from year to year in the gross domestic product is a positive change and is evidence of growth. However, in year In 2009, the GDP witnessed a decline estimated at $30.06 billion, or 16.67%. Then the GDP returned to an increase until the year 2014, where it reached $238.94 billion, returning to a gradual decline during the years 2015 and 2016. As for the year 2017, the value of the GDP was $189.88 billion, which is 5% more than in 2016, and its value also increased in the year 2009. 2019 too, but in 2020 The value decreased by $28.59 billion, or 17.48%, then in 2021 the value increased to reach $186.23 billion, then $225.64 billion in 2022.

The first law for small enterprises in Algeria began to be put in place in 2001. From the data in Table 2 and Figure 2, we note that the development of small and medium enterprises has known different levels starting from 2001. The number of enterprises was 245,348 according to the statistics of the Ministry in charge of small and medium enterprises, reaching 1,359,803 enterprises at the end of 2022, which is a very large difference that indicates the extent of interest in establishing small and medium enterprises. However, at the beginning of the period, the number of these enterprises fluctuated between increase and decrease. After the number of small and medium enterprises increased during the years 2002 and 2003, their number decreased in 2004 to reach 226,227 enterprises, a decrease of 20.6%. Then the number increased in 2005 and then in 2006, before the number decreased again in 2007, then decreased again in 2009 to become 455,989 small and medium enterprises. In 2010, the number increased by 35.76% The number of small and medium enterprises continues to increase until it reaches 1,359,803 small and medium enterprises by the end of 2022.

Based on the data in Table 2, Figure 3 highlights the differing contribution rates of SMEs to value added. From 2001 to the end of 2019, their contribution witnessed an increasing trend, from 1,745.50 million Algerian dinars at the beginning of the period to

11,450.60 million Algerian dinars at the end of 2019. However, in 2020, the value of this variable decreased by 7.2%. It is worth noting that this period witnessed the spread of the Corona pandemic, which had an impact on economic activity in various fields. However, in 2021, the figure rose again to 11,760.74 million Algerian dinars, then in 2022, it reached 12,339.32 million Algerian dinars, which is the highest contribution of SMEs to value added.

Job creation is considered one of the important contributions of small and medium enterprises to the elimination of unemployment. The variable of job creation by small and medium enterprises has witnessed an upward trend from 2001 to 2009, before declining in 2010 by 7.47%. Then, in 2011, the number of jobs created by small and medium enterprises rose to 1,724,197 jobs, and the number continued to rise from year to year until it reached 3,307,821 by the end of 2022. It is noteworthy that the number of jobs created by small and medium enterprises in Algeria increased from 737,062 jobs at the beginning of the period to reach 3,307,821, i.e. a difference of 2,570,759 jobs, which is a very large difference that highlights the extent of the contribution of small and medium enterprises to job creation and thus reducing the severity of unemployment.(See Figure 4 and Table 2),

Among the contributions of small and medium-sized enterprises (SMEs) to the economy is their contribution to exports. Figure 5 and Table 2 show that the contribution of SMEs to exports fluctuated between increases and decreases from year to year between 2001 and 2022. In 2001, the contribution of SMEs to exports was estimated at approximately $19,132 million. This figure then declined in 2002 to $18,825 million. It then rose from 2003 to $24,612 million and continued to rise until 2008, when it reached $79,298 million. In 2009, SME exports fell to $45,194 million. In 2010, SME exports rose to $57,053 million, and then reached $73,489 million in 2011. However, in 2012, exports declined to $71,866 million. Then, exports of small and medium enterprises continued to decline from year to year until the end of 2016, when they reached $13,323 million, which is the lowest value achieved by exports of small and medium enterprises. The value of exports then rose in 2017 to $18,141 million, then to $41,797 million in 2018. However, in 2019, it decreased to $35,824 million, and it also decreased in 2020 to $23,797 million. It is clear that this decline is mainly due to the effects of the Corona pandemic and the accompanying measures that led to the closure and cessation of many activities. Meanwhile, the year 2021 witnessed an increase in exports of small and medium enterprises, reaching $39,281 million, reaching $60,384 million by the end of 2022.

4. Empirical Results

4.1. Time series stationarity test

The condition of stability of time series is considered a basic condition in the study and analysis of time series, as there are several approaches to testing the stability of time series. In this research, we will use the Unit Root Test method, which can be conducted with several approaches.

Table 3 :*Time series stationarity test.*

VARIABLES	LEVEL	T-STATISTIC	PROB.*
LOGGDP	1st	-3.529	0.0180
N SMEs	1st	-8.696	0.0000
Job SMEs	1st	-4.974	0.0012
EXPO	1st	-3.837	0.0094

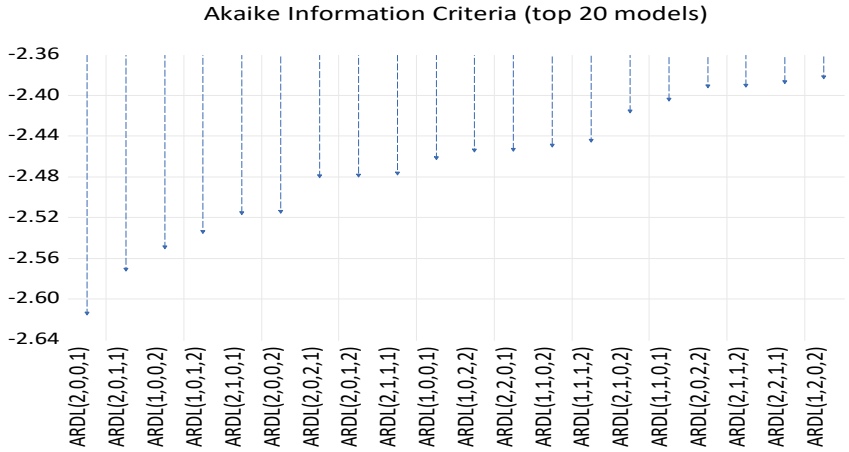
Source *:Eviews outputs.*

The previous table shows that the probability value level for each series is less than 0.05, which means that it was stable during the period from 2001 to 2022. The time series were stable at the first level, with the exception of the added value, which was stable at the second level.

4.2. Optimal slowdown periods

The optimal deceleration periods for the model are determined using the AKAIKE standard, which is the most widely accepted standard.

Figure 6:*Displaying 20 models classified according to the Akaiki (AIC) standard.*



Source ***:****Eviews outputs*

The previous figure illustrates the typical slowdown periods for the model, where it appears that the slowdown period for the model is ARDL(2.0.0.1). This means that the dependent variable, which is the gross domestic product, has two slowdown periods, while the independent variable, The independent variable, the number of small and medium enterprises, does not have a slowdown period, while the independent variable, the number of jobs, does not have a slowdown period too, and finally, the variable, the volume of exports of small and medium enterprises, has one slowdown period.

4.3. Study model Estimation

The following is a model estimation presentation, starting with long-term model estimation, then short-term model estimation, and finally the coefficient of determination and the Durbin-Watson statistic**.**

Table 4: *Long-term model estimation*

Variable	***Coefficient***	***Std. Error***	***t-Statistic***	***Prob***
LOGGDP (-1) *	*-0.216811*	*0.105485*	*-2.055368*	*0.0605*
NSMES**	*-4.26E-08*	*2.23E-07*	*-0.191314*	*0.8512*
JOBSMES**	*2.84E-08*	*9.33E-08*	*0.304577*	*0.7655*
EXPO (-1)	*3.09E-06*	*1.60E-06*	*1.931153*	*0.0756*
C	*0.995310*	*0.411433*	*2.419128*	*0.0310*
D (LOGGDP (-1))	*-0.246123*	*0.127298*	*-1.933439*	*0.0753*
D(EXPO)	*7.46E-06*	*9.80E-07*	*7.620253*	*0.0000*

Source: *Prepared by researchers based on theEviews outputs.*

Table 4 presents the results of the Autoregressive Distributed Periods (ARDL) model estimation, used to study the long-run dynamic relationships between variables. It shows the long-run estimation coefficients (levels), while the lower section presents the Error Correction Model (ECM), which integrates short-run dynamics with an adjustment mechanism toward long-run equilibrium.

In the long run, the NSMES and JOBSMES variables are not significant, as their probability values are estimated at 0.8512 and 0.7655 respectively. The LOGGDP variable and the EXPO(-1) variable are significant at the 10% level, and D(EXPO) is significant at 5%.

Table 5: *Short-term model estimation, error correction coefficient.*

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob*
COINTEQ*	*-0.216811*	*0.034148*	*-6.349154*	*0.0000*
D(LOGGDP(-1))	*-0.246123*	*0.103877*	*-2.369361*	*0.0299*
D(EXPO)	*7.46E-06*	*7.14E-07*	*10.45038*	*0.0000*
R-squared	*0.883113*			

Source : Prepared by researchers based on theEviews outputs.

The results in the table indicate, the Short-term model estimation, and error correction coefficient they indicate the statistical significance of these parameters. The short-run coefficients were statistically significant at the 5% level for D(LOGGDP(-1)) and D(EXPO).The error correction coefficient is negative and statistically significant, meaning that the model automatically corrects the error.

Table 6: *the coefficient of determination and the Durbin-Watson statistic*

R-Squared	***0.883113***
Adjusted R-Squared	*0.869362*
Durbin-Watson stat	*2.546043*
Prob(F-Statistic)	*0.000000*

Source :*Prepared by researchers based on theEviews outputs.*

The table above shows the coefficient of determination and the Durbin-Watson statistic, where the coefficient of determination is estimated at 0.88, meaning that the independent variables explain 88% of the dependent variable. The Durbin-Watson statistic also indicates no autocorrelation of errors.

- **Overall Model Evaluation**

The F-values in the previous results (0.000022 and 0.000000) indicate that the model is highly statistically significant at the 1% level. This means that the independent variables, taken together, adequately explain the variances in the dependent variable.

The coefficient of determination (R^2) of 0.883 indicates that approximately 88.3% of the variance in the dependent variable is explained by the independent variables. This is a high percentage, reflecting the model's explanatory power. (Table 4)

The adjusted coefficient of determination (R^2) in Table 6 (0.869) confirms that the model does not suffer from overfitting due to the inclusion of unnecessary variables. The Durbin-Watson statistic (2.546) indicates a lack of strong autocorrelation in the residuals, as they are close to the optimum value.

- **Long-Run Equilibrium Relationship (Table 4)**

The coefficient of the LOGGDP(-1) variable is negative (-0.2168) and statistically significant at the 10% level (p = 0.0605). This indicates an inverse effect of lagging GDP on the long-run dependent variable, which may reflect a convergence or saturation effect.

The EXPO(-1) coefficient is positive (3.09×10^{-6}) and statistically significant at the 10% level (p = 0.0756). This indicates that an increase in lagging exports leads to a slight improvement in the long-run dependent variable, although the effect is weak due to the small coefficient value.

The variables NSMES and JOBSMES were not statistically significant (p = 0.8512 and 0.7655, respectively). This indicates that these two variables had little to no long-term effect on the dependent variable. This may be attributed to the nature of these variables or to insufficient variance during the study period.

3. Short-Run Dynamics and Error Correction Model (Table 4)

The COINTEQ error correction coefficient is negative (-0.2168) and highly statistically significant at the 1% level (p = 0.0000). This confirms the existence of cointegration (long-run equilibrium) between the variables. The coefficient value represents the rate of adjustment toward equilibrium; approximately 21.7% of any equilibrium is corrected within a single period, indicating a reasonable rate of adjustment.

In the short run, based on Table 5, we observe the following

The dependent variable D(LOGGDP(-1)) shows a negative effect (-0.2461), which is statistically significant at the 5% level (p = 0.0299). This means that any change in lagging GDP leads to a decrease in the dependent variable during the current period.

The dependent variable D(EXPO)) shows a positive effect (7.46×10^{-6}), which is statistically significant at the 1% level (p = 0.0000). This is the strongest effect in the short run, reflecting the immediate growth response to changes in exports.In comparison, we note that the short-run coefficients (especially D(EXPO)) are more statistically significant than some long-run coefficients. This suggests that the impact of exports manifests more rapidly in the short run.

4.4. Diagnostic tests :

- **Bounds Test:**

Table 5 : Bounds Test.

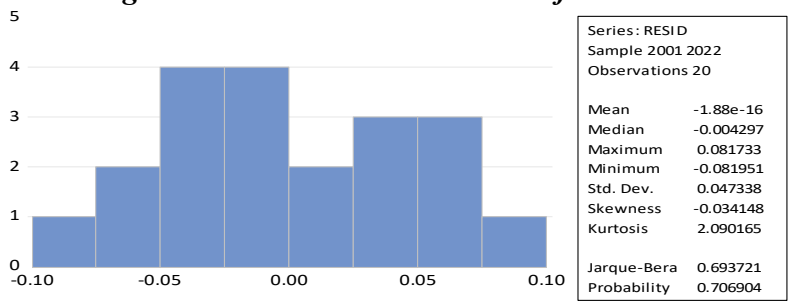
	10%		*5%*		*1%*	
Sample Size	*I(0)*	*I(1)*	*I(0)*	*I(1)*	*I(0)*	*I(1)*
30	*2.676*	*3.586*	*3.272*	*4.306*	*4.614*	*4.614*
Asymptotic	*2.370*	*3.200*	*2.790*	*3.670*	*3.650*	*3.650*
F-Statistic : 6.165						

Source :*Eviews outputs*

The results of the bounds test are evident from the table above, where the probability value F is 6.165. Comparing this to the results, we find that it is greater than the highest value at the significance level of 1%.This is evidence of mutual integration between the variables.

- **Normal distribution test :**

Figure7 :Normal distribution test of residuals.



Source :*Eviews outputs*

The normal distribution of residuals is judged by setting two hypotheses and testing the Jarque-Bera statistic. The null hypothesis states that the residuals do not follow a normal distribution, while the alternative hypothesis states that the residuals follow a normal distribution.It is clear from the previous table that the probability value is statistically significant and is estimated at 0.693, which is greater than 0.05. This means accepting the alternative hypothesis and saying that the residuals follow the normal distribution.

- **Autocorrelation :**

Table 6 :*Breusch-Godfrey Serial Correlation LM Test.*

Breusch-Godfrey Serial Correlation LM Test:			
Null hypothesis: No serial correlation at up to 1lags			
F-Statistic	*3.623*	*Prob. F(2,7)*	*0.0812*
*Obs*R-Squared*	*4.638*	*Prob. Chi-Square(2)*	*0.0313*

Source :*Eviews outputs*

The Breusch-Godfrey test was used, and the table above shows that the statistical value F equals 3.623 and the probability value is estimated at 0.0812, which is greater than 5%. This means that there is no autocorrelation of errors in the model and the second condition is met.

- **Homoscedasticityof Variance**

Table 7: Heteroskedasticity Test: ARCH

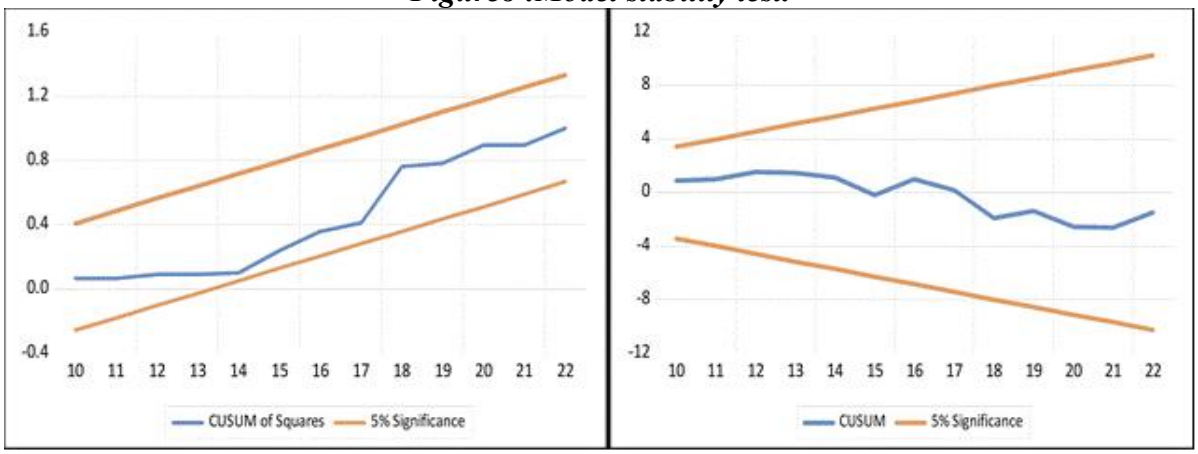
Heteroskedasticity Test: ARCH			
F-Statistic	*2.126*	*Prob. F(1,17)*	*0.1630*
*Obs*R-Squared*	*2.112*	*Prob. Chi-Square(1)*	*0.1461*

Source :*Eviews outputs*

The ARCH test was used, as shown in the previous table, where the statistical value F equals 2.126 and the probability value is estimated at 0.1630, which is greater than 5%, indicating homogeneity of variance in the model and fulfillment of the third condition.

- **Model Stability Test:**

Figure8 :Model stability test.



Source :*Eviews outputs*

The previous figure clearly shows that the model is stable and does not exhibit any structural changes, as both the CUSUM and CUSUMSQ tests fall within the upper and lower critical limits, respectively, at a significance level of 5%. This indicates structural stability and consistency in both the short and long term during the study period from 2001 to 2022.

Based on the diagnostic tests conducted, the model demonstrates robustness and reliability across all standard econometric assumptions. The Jarque-Bera test probability (0.7069) confirms that the residuals follow a normal distribution, while the Breusch-Godfrey LM test (F-statistic prob: 0.0812) indicates no serious serial correlation issues at conventional levels. Furthermore, the CUSUM and CUSUM of Squares stability tests show that the model parameters remain within the 5% critical bounds throughout the sample period, confirming structural stability. These results, combined with the bounds test F-statistic (6.165) which exceeds the 1% critical value, provide strong evidence of a stable cointegrating relationship. Collectively, these diagnostics validate that the previously established long-run equilibrium and short-run dynamics are statistically robust and not spurious.

The ARDL model estimation results confirm a robust long-run equilibrium relationship among the variables, validated by the highly significant and negative error correction term (COINTEQ = -0.2168, $p < 0.01$), which indicates that about 21.7% of any short-run disequilibrium is corrected annually. The model demonstrates strong explanatory power, with an R-squared of 0.883, meaning the independent variables explain 88.3% of the variation in the dependent variable. In the long run, lagged GDP (LOGGDP(-1)) and lagged exports (EXPO(-1)) are only weakly significant at the 10% level, while the SME-related variables (NSMES and JOBSMES) are statistically insignificant, suggesting they have no meaningful

long-term impact. However, short-run dynamics reveal that changes in exports (D(EXPO)) have a powerful and highly significant positive effect at the 1% level, identifying exports as the primary short-term growth driver. The findings imply that while exports provide immediate economic stimulus, their long-term benefits are marginal, and the SME sector requires re-examination through alternative metrics to capture its potential contribution.

5. Discussion of Results

The results showed that the long-term increase in the number of small and medium enterprises (SMEs) was not statistically significant. This means that the first hypothesis, "Increasing the number of small and medium enterprises contributes to improving the level of gross domestic product," is not supported. Similarly, the second hypothesis, "Jobs created by small and medium-sized enterprises contribute to increasing the level of gross domestic product," is also not supported.The number of jobs was not statistically significant, while the value of exports from SMEs was statistically significant, thus confirming the third hypothesis: "The value of exports from small and medium enterprises contributes to increasing the gross domestic product." Therefore, exports of Algerian SMEs are the only ones that contribute to increasing the gross domestic product, although this increase is considered weak. Other studies have reached the same conclusion. The study of (meddane, 2023), titled "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 2002-2004," concluded that the increase in the number of small and medium enterprises (SMEs) does not affect non-hydrocarbon exports. This means that the proportion of SME exports is very small compared to hydrocarbon exports, thus confirming the study's findings.theStudy of (MECHAALI & MAHREZ, 2020) confirmed that the performance of small and medium enterprises is weak and that the contribution of this type of enterprise to economic development has not lived up to expectations.One study (Elmihoub & Belkhir, 2024) concluded that increasing the number of small and medium-sized enterprises (SMEs) contributes to an increase in non-hydrocarbon exports by a factor of 0.83, while another study (Bouchikhi & Sadouki , The impact of the establishment of small and medium enterprises on Algerian exports outside the hydrocarbon sector, 2018) found that increasing the number of SMEs contributes to an increase in non-hydrocarbon exports by a factor of 0.86.Another study (rekrak, labsi, & sellali, 2022) found that SMEs create new jobs that contribute to economic growth by a factor of 1.2694, while increasing the number of SMEs contributes by a factor of 2.723. These results appear to contradict the findings of the first study, perhaps due to the different timeframes covered, which spanned from 2001 to 2018.

In general, the contribution of SMEs to the economic process is below expectations, despite the efforts made by various bodies that aim to support and assist them, such as the National Agency for Entrepreneurship Development(NESDA).The weak contribution of small and medium-sized enterprises (SMEs) to economic development in Algeria is due to a range of structural, organizational, and financial reasons that hinder their development, growth, and effective contribution to GDP, job creation, and reducing dependence on the hydrocarbon sector.

6. Conclusion

In conclusion, the vital role played by small and medium-sized enterprises (SMEs) in supporting economic development cannot be denied, thanks to their flexibility and adaptability. These enterprises are also a fundamental pillar in creating job opportunities, stimulating entrepreneurship, and diversifying the national economic fabric away from over-reliance on the hydrocarbon sector. However, their contribution to economic development, as presented in the results for the period from 2001 to 2022, is very weak. SMEs represent the cornerstone of the national economic fabric and are among the essential tools upon which Algeria relies to achieve sustainable and balanced economic development. Global experience,

particularly in emerging countries, has proven that supporting these enterprises contributes to stimulating economic growth, diversifying sources of income, and creating job opportunities, making this sector an indispensable strategic partner in any effective development policy. In Algeria, despite the numerous challenges facing small and medium-sized enterprises (SMEs)—whether in terms of financing, bureaucracy, weak training, or limited market access—this sector still holds tremendous potential that can be better exploited through the adoption of profound structural reforms, the establishment of more flexible legal and regulatory frameworks, the promotion of a culture of entrepreneurship, the stimulation of innovation, and the encouragement of public-private partnerships.

Furthermore, directing efforts toward developing a stimulating business environment, providing technical and administrative support, and facilitating access to financing would enhance the ability of these enterprises to play a more dynamic role in addressing current economic challenges, most notably reducing dependence on hydrocarbons, achieving food security, developing manufacturing industries, and integrating the informal economy.

The future of the Algerian economy, in light of regional and international transformations, largely depends on the state's ability to enable SMEs to fully fulfill their role, not only as a source of growth and employment, but also as an effective driver of innovation and balanced local development. Therefore, investing in this sector is not a secondary option, but rather an urgent necessity imposed by the demands of the current situation and the desire to build a strong, diversified, and resilient national economy in the face of crises.

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