

Investigating Entrepreneurship as a Driver of Economic Performance: An Econometric Analysis of the Algerian Case

Lilia TAALLAH¹, Governance Horizons Laboratory for Sustainable Local Development, Department of Economic Sciences, Institute of Law and Economic Sciences, University Center of Barika, Algeria, lilia.taallah@cu-barika.dz

Nourelhouda BOUHEROUR, Governance Horizons Laboratory for Sustainable Local Development, Department of Economic Sciences, Institute of Law and Economic Sciences, University Center of Barika, Algeria, nourelhouda.bouherour@cu-barika.dz

Amira BOUCENNA, University Ferhat Abbas, Setif 1, Algeria, amira.boucenna@univ-setif.dz

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Abstract :

This study investigates the influence of entrepreneurship on economic performance in Algeria, as an emerging economy. An Ordinary Least Squares (OLS) multiple regression, estimated with STATA 17.0 software, was used to model GDP as a dependent variable, and the key entrepreneurial activity indicators as the independent variables.

The empirical findings reveal that both the number of SMEs and credit to the private sector exert a significant positive influence on GDP; however, their impact remains relatively weak. Conversely, unemployment shows a significant negative effect on Algeria's GDP, while technological development appears to have no statistically significant impact. This paper concludes that entrepreneurial activity in Algeria remains limited and fails to exert a substantial influence on economic performance and to create significant value added, in contrast to developed economies. This gap is often attributable to the structural characteristics of the Algerian economy, including its high dependence on the hydrocarbon sector, limited diversification, and the predominance of very small, low-productivity, non-innovative enterprises over the institutional fabric.

Key words: Entrepreneurial Activity Indicators, SMEs, Economic Performance, Algeria.

ملخص:

تبحث هذه الدراسة في تأثير ريادة الأعمال على الأداء الاقتصادي في الجزائر، باعتبارها اقتصاداً ناشئاً. وقد تم استخدام أسلوب الانحدار الخطي المتعدد بطريقة المربعات الصغرى الاعتيادية (OLS)، والمُقَدَّر باستخدام برنامج STATA 17.0، لنموذج الناتج المحلي الإجمالي (GDP) كمتغير تابع، ومؤشرات النشاط الريادي الرئيسة كمتغيرات مستقلة.

¹ Corresponding Author.

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أظهرت النتائج أن عدد المؤسسات الصغيرة والمتوسطة والائتمان الممنوح للقطاع الخاص يؤثران إيجابيًا وبشكل معنوي على الناتج المحلي، لكن أثرهما الإجمالي ضعيف، في حين يؤثر معدل البطالة سلبًا، ولا يظهر التطور التكنولوجي أثرًا معنويًا. وتخلص الدراسة إلى أن النشاط الريادي في الجزائر ما يزال محدودًا، ويرجع ذلك إلى خصائص الاقتصاد الجزائري، خاصة اعتماده الكبير على قطاع المحروقات وضعف التنويع الاقتصادي وهيمنة المؤسسات الصغيرة جدًا منخفضة الإنتاجية وغير المبتكرة.

الكلمات المفتاحية: مؤشرات النشاط الريادي، المؤسسات الصغيرة والمتوسطة، الأداء الاقتصادي، الجزائر.

Introduction:

According to the Neo-Schumpeterian theory of economic growth, innovation is regarded as the main driver of long-term economic development. Therefore, technological change and all factors that generate new information are the foundation of development (Facchini, 2007, p. 8). Thus, public authorities increasingly recognize entrepreneurship as a fundamental economic and social issue, playing a role as an accelerator of economic growth, a generator of wealth, contributing to job creation, and rejuvenating the business community (i.e., the creation of new enterprises). Small and medium-sized enterprises (SMEs) are considered the heart of the economy (Kara & Aknine-Souidi, 2022, p. 90).

Noting that for developed countries and especially in the OECD area, « 99% of the total businesses are SMEs, they constitute the bulk of the business fabric, i.e. almost 60% of employment and between 50% and 60% of added value » (OECD, 2019, p. 3). SMEs play a vital role in promoting sustainable and inclusive economic growth by helping economies adapt to major shifts such as digitalisation, globalisation, demographic change, and environmental challenges.

In Algeria, entrepreneurial activity has witnessed steady growth, with a continuous rise in the number of SMEs, particularly in the context of the country's transition from a state-controlled to a market-oriented economy. Interest in the field of entrepreneurship began in 1999, evolving into a dominant business philosophy. It has become an integral part of economic reforms and structural adjustment programs (SAPs), due to its pivotal role in reshaping the country's economic structure and generating positive socioeconomic outcomes—such as technological advancement, employment growth, and increased income levels. Moreover, due to the influence of global trends and globalization, the intention to engage in entrepreneurial activity, reflecting a growing *entrepreneurial spirit*, has significantly increased among individuals (Laib & Benredjem, 2017).

In this context, the present study seeks to evaluate entrepreneurial activity in Algeria and examine its impact on economic performance, based on reliable,

measurable, and accessible data. Accordingly, the main objective of this research is to address the following question:

Do entrepreneurial activity indicators have a significant impact on Algeria's economic performance ?

To carry out our study, this article is structured as follows:

- *The first section provides represents theoretical framework* including a brief review of the literature on entrepreneurship, followed by the conceptual framework of entrepreneurship, its key indicators, and an overview of the entrepreneurial case in Algeria.
- *The second section represents the empirical part*, it outlines the the variables and data employed in the current study, followed by a descriptive analysis of the main indicators of entrepreneurial activity. Finally, empirical findings derived from the econometric analysis are then presented, interpreted, and discussed in light of the theoretical and contextual elements.

FIRST SECTION: THEORETICAL FRAMEWORK

This section presents the study's theoretical and conceptual foundations, drawing on relevant literature to frame the analysis. It clarifies basic entrepreneurship concepts, identifies key indicators of entrepreneurial activity, and provides an overview of the Algerian context.

1st REQUIREMENT: Literature Review

Entrepreneurship has attracted growing attention from the scientific community, largely due to its significant contribution to national and global economic development. In this context, we briefly present a selection of relevant literature reviewed during the preparation of this study.

First: The study of (Zarkua, Heijman, Benešová, & Krivko, 2025) analyzed the relationship between entrepreneurship, measured by the Global Entrepreneurship Index (GEI), and economic development, proxied by GDP per capita, across 98 developed and developing countries from 2015 to 2019. Using cross-sectional OLS and 2SLS regression methods to address endogeneity, the results revealed a strong and statistically significant positive relationship between GEI and GDP per capita. Specifically, a 1% increase in GEI was associated with a 3.04% rise in GDP per capita, highlighting entrepreneurship as a key driver of economic development.

Second: (Himrane & Bouznit, 2019) conducted an econometric modeling study on panel data examining the determinants of entrepreneurial activity in the Maghreb countries, focusing on female, male, and national entrepreneurship. Their findings revealed notable differences in the factors influencing male and female entrepreneurship. Across all three categories, GDP per capita and credit to the private sector had a significant and positive impact, while entry costs showed a significant negative effect. Additionally, internet access and population growth were positively and significantly associated with entrepreneurial activity in the three categories. In contrast, the tax variable had a strongly significant negative effect, particularly on the dynamics of female entrepreneurship.

Third: (Mekhzoumi & Gharbi, 2021) examined the impact of entrepreneurship on economic growth using panel data of 28 Industrialized Country over the period 2001–2019. The results showed that Total Early-Stage Entrepreneurial Activity (TEA) had a significantly negative effect on GDP per person employed, both in static and dynamic models. Conversely, Government Entrepreneurship Programs (GEP) had a significantly positive effect in the dynamic model, highlighting the importance of institutional support in enhancing the effectiveness of entrepreneurial efforts.

Fourth: (Kara & Aknine-Souidi, 2022) indicated that the number of businesses in Algeria increased significantly between 2003 and 2019, largely as a result of public sector reforms aimed at promoting entrepreneurship, reducing unemployment, and stimulating economic growth. While this expansion led to job creation, its impact remained limited due to the small size of most newly established businesses and their concentration in low-innovation sectors. As emphasized by Schumpeter, only innovative enterprises can effectively drive economic development, a condition that many of these businesses fail to meet.

Fifth: According to (Imansouren, 2021), despite the economic reforms it has in Algeria, the country continues to struggle in establishing a business-friendly environment where the private sector can assume its role as a key driver of a modern economy. This shortcoming is largely attributed to persistent barriers hindering the creation and growth of SMEs. These include bureaucratic inefficiencies, limited innovation infrastructure, restricted access to credit, high costs of credit, elevated tax rates, short banking deadlines, and prevailing

uncertainty surrounding economic policy and customs regulations. Addressing these constraints will require sustained and proactive government intervention.

Sixth: As highlighted by (MOULOUD, 2022), the World Bank's Doing Business 2020 report ranked Algeria 157th out of 190 economies in terms of the global business climate. This low ranking reflects the persistent cultural, social, and economic constraints faced by Algerian SMEs, despite the substantial financial resources allocated to the sector over the past two decades. These findings underscore the urgent need for the Algerian state to reconsider and reform its public policies in support of entrepreneurship.

2nd REQUIREMENT: Conceptual Framework

This part clarifies key entrepreneurship concepts, details relevant entrepreneurship activity indicators, and highlights characteristics of entrepreneurship in Algeria.

First: Related Entrepreneurship Concepts

According to the (OCDE, 2011), there is no single, agreed-upon definition of entrepreneurship. It is a broad and complex concept that depends on the field of study, such as economics, business, or innovation. Entrepreneurship can take many forms and lead to different outcomes—not just financial gain, but also job creation, reducing inequality, or solving environmental problems through innovation.

(Schumpeter, 1947, p. 151) stated that "The entrepreneur and his function are not difficult to conceptualize; the defining characteristic is simply that he does new things or does things that are already done in a new way."

The definition developed by the OECD-Eurostat Entrepreneurship Indicators Programme (EIP) focuses on the business dimension of entrepreneurship and breaks it down into three main components (Ahmad & Hoffman, A Framework for Addressing and Measuring Entrepreneurship, 2007):

- 1. Entrepreneurs** are individuals (business owners) who create or grow an economic activity by identifying and exploiting new products, processes, or market opportunities to generate value.
- 2. Entrepreneurial activity** refers to the actions taken to start or expand a business with the purpose of creating value through innovation or market exploration.

3. Entrepreneurship is the phenomenon encompassing these entrepreneurial activities.

Second: Indicators of Entrepreneurial Activity

The Global Entrepreneurship Monitor (GEM)² is a project launched in 1999, provides yearly insights into entrepreneurial attitudes, aspirations, and activity across countries. It examines how various national factors—such as education, laws, infrastructure, technology, finance, and R&D—shape the entrepreneurial environment. GEM emphasizes that these social, cultural, institutional, and political conditions influence entrepreneurship and, in turn, impact business creation and economic growth.

In this context, numerous studies conducted across various countries and regions have highlighted the wide diversity of political, economic, institutional, and sociocultural environments influencing entrepreneurship. This diversity has resulted in significant disparities in entrepreneurial dynamism and differences in the performance of SMEs from one country to another. (Nlemvo, Biga-Diambeidou, & Coeurderoy, 2011). These variations reflect the fact that each region relies on its own set of indicators to measure entrepreneurship, shaped by its institutions, political decisions (such as reforms), and support programs (Bouyacoub, 2021).

Van Praag, 1999; Lumpkin & Dess, 1996; Bull & Willard, 1993 highlight that there is no universally standardized set of indicators for measuring entrepreneurship, because comparing entrepreneurial activity across different countries and time periods remains a complex task. However, some researchers have identified indicators of entrepreneurial activity that are relatively easy to quantify, practical, and comparable across countries. However, these indicators still represent only approximate reflections of the complex entrepreneurial reality (Verheul, Wennekers, Audretsch, & Thurik, 2001).

Researchers have categorized these approximate indicators into various dimensions. According to (Wennekers, Uhlaner, & Thurik, 2002), (Himrane & Bouznit, 2019), as well as (Ahmad & Hoffman, A Framework for Addressing and Measuring Entrepreneurship, 2007), the indicators of entrepreneurial activity are generally classified into several categories of factors, namely:

² GEM data is based on two major annual surveys: one of the Adult population survey (APS) and the other of a sample of National Expert Survey (NES).

1. **Economic dimension:** includes (i) *per capita income*, which reflects the level of capital per person and overall economic development; (ii) *the unemployment rate*, which may either encourage or discourage entrepreneurship, depending on its level; and (iii) *inflation*, which discourages entrepreneurship because it makes the business environment more dangerous.
2. **Institutional dimension:** includes (i) *taxation level* that affects business creation and the rate of entry into the business climate; (ii) *credit provided to the private sector* reflecting financial development and directly influences the rate of business creation; (iii) *entry cost*, including all initial costs, indicating the facilities or difficulties imposed by government regulations. Moreover, *political and legal decisions* also play a significant role in shaping the entrepreneurial environment
3. **Technological dimension:** This refers to the availability and use of digital infrastructure, such as internet access and information and communication technologies (ICT) tools, which facilitates innovation, improves market access, enhances communication, and lowers entry barriers, thereby fostering entrepreneurial activity.

According to (Verheul, Wennekers, Audretsch, & Thurik, 2001), as cited by (Himrane & Bouznit, 2019), additional indicators of entrepreneurial activity include **demographic and cultural dimensions**. Demographic indicators, particularly population growth, reflect the potential for entrepreneurship by increasing demand for goods and services and enlarging the pool of potential entrepreneurs. Similarly, cultural indicators such as societal values, dominant beliefs, and collective attitudes toward risk-taking, innovation, and self-employment help shape the entrepreneurial environment. Societies that embrace initiative, support innovation, and tolerate failure tend to exhibit stronger entrepreneurial dynamism.

Third: Entrepreneurship in Algeria: An Overview

Before the economic reforms of the 1990s, SMEs in Algeria faced significant constraints due to bureaucratic barriers, weak private savings, and limited access to credit. The implementation of the Structural Adjustment Program (SAP) led the state to reduce its role as the main investor, resulting in rising unemployment and declining public investment. In response, the government introduced the 1993 Investment Code, which for the first time since independence, liberalized private initiatives and opened the banking sector to private actors. Institutions like the Agency for the Promotion, Support and Monitoring of Investments (APSI) were created to support this shift. since the 2000s, public authorities renewed their

commitment to fostering private investment and supporting the SME sector (MOULOUD, 2022, p. 316), (Aknine Souidi & Ferfera, 2014).

Currently, Algeria supports the entrepreneurship sector through three main categories of public institutions:

1. **Administrative, advisory, and informational bodies**, such as the ANDPME³, CNC-PME⁴, and the National Subcontracting Council.
2. **Support organizations offering financial, tax, and parafiscal benefits**, including ANADE⁵ (formerly ANSEJ), CNAC⁶, ANGEM⁷, and ANDI⁸, which are public programs aimed at economic integration and combating unemployment.
3. **Guarantee mechanisms**, such as the Investment Support Fund, FGAR⁹, and CGCI-PME¹⁰.

Based on data from Statistical Information Bulletins on SMEs published by the Ministry of Industry and Investment Promotion for 2002–2022 (Khelli & Loucif, 2024, pp. 163-164), (Hani & Gana, 2024):

- The share of private SMEs in Algeria remains at 99.91%.
- Their number has jumped from 244,560 companies with 639,140 jobs created in 2001 to 1,359,580 in 2022 with 3,083,503 jobs created, marking a fivefold increase in 20 years, while jobs created by SMEs have quadrupled over two decades.
- The density of SMEs (per 1,000 inhabitants) increased from 17 to 28 in 2009-2021, reaching 30 companies per 1,000 inhabitants in 2022.

However, Algeria stands out among MENA countries for having the least favorable conditions and societal attitudes toward entrepreneurship and business climate. This situation is largely attributed to its heavy reliance on hydrocarbon revenues, which account for a significant portion of exports, fiscal income, and GDP (Despots, Henider, & Prinz, 2023). Such dependence on oil rent has historically discouraged economic diversification and weakened institutional focus on developing a dynamic private sector.

³ Agence nationale de développement de la PME.

⁴ Conseil national de concentration pour le Développement de la PME.

⁵ Agence nationale d'appui et de développement de l'entrepreneuriat.

⁶ Caisse nationale d'assurance chômage.

⁷ Agence nationale de gestion du microcrédit.

⁸ L'Agence nationale du développement des investissements.

⁹ Fonds de Garantie des Crédits aux PME.

¹⁰ La caisse de garantie du crédit d'investissement.

SECOND SECTION: EMPIRICAL FINDINGS

This section presents the empirical evidence of the study. It begins with a description of the data and variables, followed by a descriptive analysis of entrepreneurial activity indicators. The econometric model is then specified, estimated, and interpreted, with the results discussed in light of the research objectives.

1st REQUIREMENT: Data and Variables

This study will focus on a select set of entrepreneurial activity indicators considered to be the most important and relevant and likely to impact the country's economic performance, and which are also accessible in terms of consistent data availability, in light of the limited and insufficient macroeconomic data for the country.

Table 1: Study Variables and Data Sources.

Label	Description	Data Sources	Period
Dependent Variable			
GDP	Economic performance (constant LC - million DZD)	World Development Indicators (WDI), World Bank.	2001-2023
Independent Variables			
SME	Number of private SMEs	Statistical Information Bulletins on SMEs, Ministry of Industry. ¹¹	1994-2023
EmpSME	Jobs created by SMEs	Statistical Information Bulletins on SMEs, Ministry of Industry.	1994-2023
HDI	Human development index	United Nations Development Programme (UNDP), Human	1994-2023

¹¹ Data from 1994 to 2000 were estimated based on the annual growth rate observed between 1992 (22,400 enterprises) and 2001 (244,580 enterprises), while the 2023 value is a proxy estimate.

Investigating Entrepreneurship as a Driver of Economic Performance: An Econometric Analysis of the Algerian Case

		Development Reports (HDR).	
CrePS	Credit provided to the private sector (in million DZD)	World Development Indicators (WDI), World Bank.	1994-2023
Unemp	Total unemployment (number of unemployed in the active population)	World Development Indicators (WDI), World Bank	1994-2023
Net	Technological development represented by internet access	World Development Indicators (WDI), World Bank.	1994-2023

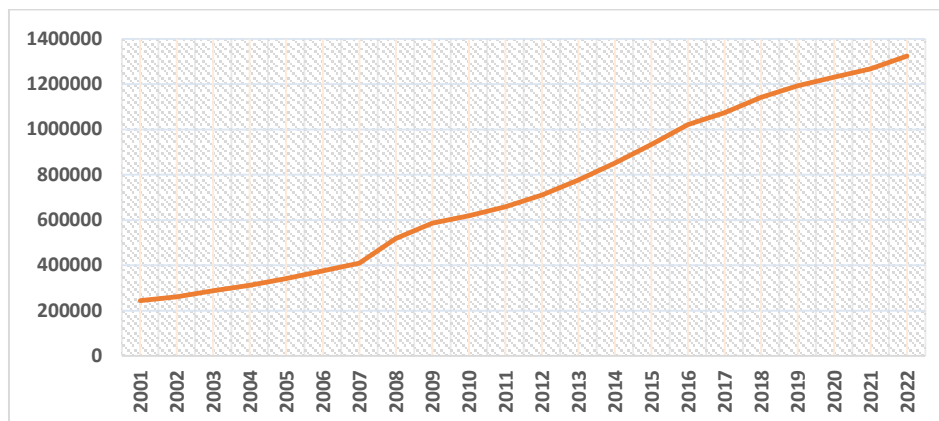
Source: Elaborated by Author.

2nd REQUIREMENT: Descriptive Analysis of Entrepreneurial Activity Indicators

One of the most commonly used indicators to assess entrepreneurship growth is the SME creation ratio. As shown in Figure 1, the number of entrepreneurship projects (SMEs) in Algeria grew substantially between 2010 and 2022, registering a total increase of 440% and an average annual growth rate of 8.47%. This upward trend reflects a notable expansion of entrepreneurial activity and private sector engagement. However, despite this progress, the rate of SME creation remains relatively modest when compared to demographic growth and the rising demand for employment opportunities.

Figure (1): Trends in Entrepreneurship Projects (SMEs), 2001–2022

Investigating Entrepreneurship as a Driver of Economic Performance: An Econometric Analysis of the Algerian Case



Source: Author's elaboration based on data from SME Statistical Information Bulletins.

As shown in Table (2), Algeria has experienced a gradual rise in SMEs density over the period from 2010 to 2022. The number of SMEs increased from around 18 enterprises in 2010 to 29 enterprises in 2022 for each 1000 inhabitants, marking a growth of approximately 63%. This upward trend reflects an ongoing expansion of entrepreneurial activity across the country. However, despite these improvements, the overall SMEs density in Algeria remains relatively low compared to international benchmarks. In OECD member countries, SME density typically ranges between 45 and 60 per 1,000 inhabitants, which underscore the need for stronger support policies to stimulate entrepreneurship in Algeria.

Table (2): Evolution of the SMEs density (per 1000 inhabitants) in Algeria, 2013-2022

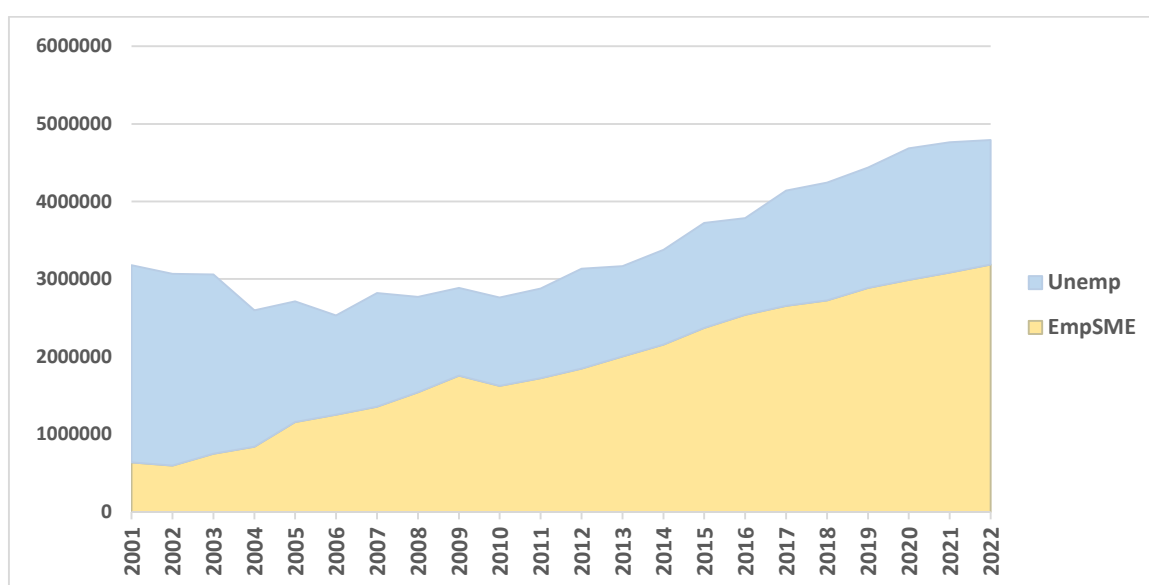
Year	2010	2012	2014	2016	2018	2020	2022
SMEs Nb°	777259	711275	851511	1022231	1141602	1230844	1323580
Density	17,96	18,98	21,78	25,04	26,82	28,07	29,32

Source: Author's elaboration based on data from SME Statistical Information Bulletins.

The figure below shows a remarkable upward trend in the number of jobs created by SMEs, rising from 639,140 jobs in 2001 to 3,185,503 jobs in the first half of 2022, representing a growth of 389%. The number of unemployed, on the

other hand, is increasing significantly over the same period. This indicates that, despite the substantial contribution of SMEs (private sector) to job creation, their growth has not been sufficient to absorb the rising labor force driven by population growth, which continues to generate increasing demand for employment.

Figure (2): Evolution of employment created by SMEs and overall unemployment in Algeria, 2001-2022



Source: Author's elaboration based on data from SME Statistical Information Bulletins and WDI.

3rd REQUIREMENT: Model and Results

This subsection outlines the econometric model used in the analysis, details the estimation procedure and diagnostic tests, and presents the results alongside their interpretation.

First: Model Specification

To address the central research question and estimate the impact of entrepreneurial activity indicators on Algeria's economic performance, this study employs an econometric analysis based on the Ordinary Least Squares (OLS) multiple regression method. The estimation is carried out using STATA 17.0 software.

Investigating Entrepreneurship as a Driver of Economic Performance: An Econometric Analysis of the Algerian Case

An initial unrestricted model was estimated, including all theoretically relevant explanatory variables representing entrepreneurial activity indicators mentioned in Table (1). It was specified as follows:

$$\text{Log GDP}_t = \text{Cons.} + \beta_1 \log(\text{SMEs}_t) + \beta_2 \log(\text{EmpPME}_t) + \beta_3 \log(\text{CrePS}_t) + \beta_4 \log(\text{HDI}_t) + \beta_5 \log(\text{Unemp}_t) + \beta_6 \log(\text{NET}_t) + \mu_t$$

Where : *Cons.* : denotes the constant term,
 β_i : represent the estimated slope coefficients,
 μ_t : is the error term,
 t : is the time index (year).

However, the first results indicated a lack of statistical significance for most of regressors and produced economically inconsistent coefficients, indicating potential *multicollinearity*. To diagnose this issue, a *correlation matrix* and *Variance Inflation Factor (VIF)* analysis were conducted. The diagnostics revealed a strong *linear association* between *SME* and *EmpSME*, and also between *Unemp* and *EmpSME*, as well as the *HDI* demonstrated high collinearity with all other explanatory variables, reflected in its elevated VIF score.

Accordingly, the model was respecified by excluding the problematic variables. The resulting specification satisfies the classical linear regression assumptions and offers a more robust and interpretable economic estimates.

The final econometric model retained in this study is as follows:

$$\text{Log GDP}_t = \text{Cons.} + \beta_1 \log(\text{SME}_t) + \beta_2 \log(\text{CrePS}_t) + \beta_3 \log(\text{Umenp}) + \beta_4 \log(\text{NET}_t) + \mu_t$$

Second: Estimation and Diagnostics

Examining the section related to the overall significance and goodness of fit in Table (3), we find that the *p-value* associated with the computed Fisher statistic ($F_c = 262.2$) is 0%, which is well below the 1% significance level. This result confirms that the model is statistically significant as a whole. Furthermore, the coefficient of determination (*R-squared*) is notably high at 0.97, indicating a strong fit between the model and the data. The *adjusted R-squared* is also substantial, implying that approximately 96.76% of the variability in the dependent variable is explained by the independent variables.

Turning to the lower section of the table, which reports the individual significance of the explanatory variables, we observe that the *p-values* for the

Investigating Entrepreneurship as a Driver of Economic Performance: An Econometric Analysis of the Algerian Case

variables *LSME*, *LUnem*, *LCrePS*, and *Cons.* are all below the 5% significance level. This indicates that these variables have a statistically significant impact on the dependent variable *LGDP*. In contrast, the variable *LNet* has a *p-value* exceeding the 5% threshold, suggesting that it does not exert a statistically significant effect on *GDP* within the context of this model.

Table (3): Estimation results

Source	SS	df	MS	Number of obs	=	30
-----+-----				F(4, 25)	=	289.79
Model	.400898803	4	.100224701	Prob > F	=	0.0000
Residual	.003632415	25	.000145297	R-squared	=	0.9710
-----+-----				Adj R-squared	=	0.9676
Total	.404531218	29	.013949352	Root MSE	=	.01205
-----+-----						
LGDP	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
-----+-----						
LSME	.2753996	.0262491	10.49	0.000	.2213386	.3294606
LUnemp	-.0348778	.0257511	-2.04	0.046	-.1029132	.0031576
LCrePS	.064613	.0263063	2.46	0.021	.0104342	.1187919
LNet	.0147603	.0052412	-0.91	0.372	.0155548	.0060342
_cons	5.176502	.2066525	25.05	0.000	4.750893	5.602111
-----+-----						

Source: STATA 17 outputs.

Before interpreting and discussing the estimation results, it is essential to assess the robustness of the model through diagnostic testing to avoid misleading conclusions and ensure the reliability of the conclusions. Specifically, we conduct three key diagnostic tests: the Jarque–Bera test for *normality* (based on skewness and kurtosis), the Breusch–Pagan/Cook–Weisberg test for *heteroskedasticity*, and the Breusch–Godfrey Lagrange Multiplier (LM) test for *autocorrelation*.

The detailed results are provided in the appendix and are summarized in the following table:

Table (4): Diagnostic tests

Investigating Entrepreneurship as a Driver of Economic Performance: An Econometric Analysis of the Algerian Case

Diagnostic test	Chi 2 (Prob.)	Accepted hypothesis
Normality test (Skewness/Kurtosis tests)	1.59 (0.4518)	H0: residuals are normally distributed
Heteroskedasticity test (Breusch-Pagan/Cook-Weisberg)	1.42 (0.2335)	H0: residuals are not heteroscedastic
Autocorrelation test (Breusch-Godfrey LM test)	7.059 (0.0709)	H0: residuals are not autocorrelated

Source: Author's elaboration based on STATA 17.

According to the results presented in Table (4), the null hypotheses of all three diagnostic tests cannot be rejected, as their p-values exceed the 5% significance level. This indicates that the residuals are homoscedastic, free from autocorrelation, and approximately normally distributed. Therefore, the model satisfies the key classical linear regression assumptions, and the estimation results can be considered statistically reliable.

Third: Discussion of the Results

The estimated coefficients indicate that the number of *SMEs* has a positive and highly significant impact on GDP, and with each new SME created, the GDP increases by 0.27%. This result highlights the important role that SMEs can play in driving economic growth and supporting overall economic performance. However, despite their positive contribution, the overall impact of SMEs on Algeria's economic performance remains relatively weak. This is often due to the fact that approximately 97% of SMEs are very small enterprises (VSEs) employing fewer than 10 individuals, which constrains their productive capacity and economic impact. Furthermore, most of these enterprises operate in non-innovative, low-productivity, and low-value-added sectors. As a result, their contribution to long-term sustainable economic growth and performance remains limited in light of the current structural conditions.

Empirical results reveal a statistically significant inverse relationship between *unemployment (Unemp)* and GDP, whereby each additional unemployed person is associated with a 0.03% decline in GDP. Algeria has a large youth population, representing an underutilized human resource (structural unemployment), that does not contribute to value creation, negatively impacting economic growth and

performance. This negative impact is also attributed to chronic structural imbalances in the labor market, reflected by the national economy's dependance on the hydrocarbon sector that has a limited role in job creation, lack of economic diversification such as industrial and agricultural sectors (which create jobs), the private sector's limited contribution to job creation, the mismatch between educational outputs and labor market demands, and other factors that hinder GDP growth and weaken the economic performance.

While *credit to the private sector (CrePS)* has a positive and significant impact on GDP, as a one-unit increase in this variable leads to a 0.06% increase in GDP, its overall role in explaining economic growth in Algeria remains weak. This limited contribution can be attributed to several structural characteristics of the Algerian economy, most notably: the low effectiveness of the banking system in financing private sector enterprises (unlike with the public sector institutions), largely due to insufficient guarantees and limited financial innovation. Moreover, when credit is granted to the private sector, it is frequently allocated to non-productive activities, such as trade or imports, rather than to real investment projects capable of generating substantial added value or directly boosting GDP. It is also worth noting that the Algerian economy relies primarily on oil rents, with hydrocarbon revenues constituting the primary source of GDP and foreign currency. Therefore, economic growth in Algeria is not necessarily driven by the volume of bank financing directed to the private sector.

These results are consistent with several previous studies. For example, the study by (Bendahmane & Kerrouche, 2021) concluded that credit directed to the private sector is insensitive to growth (an insignificant effect), which reflects the weak efficiency of directing financial resources. The study by (Habib, Zegrier, & Belkhir, 2024) also concluded that credit granted to the private sector has a negative or insignificant effect on growth, and they attribute this to the weakness of the banking system in supporting private investment.

The level of internet access, which reflects technological development, does not significantly affect GDP. This is often due to the limited adoption of information and communication technologies (ICT) and technological advancements among Algerian enterprises. The majority of these firms are very small enterprises (VSEs) operating in sectors with relatively low, or almost non-existent technological requirements and only a few of them are innovative companies (such as startups) which, unlike traditional companies, rely extensively on ICT and technological innovation to develop their products, improve service quality, manage their business, and enhance their visibility through presence on

social networks and other digital platforms to promote their profiles and expand their customer base.

This is also what the study by (Hadroug & Farah, 2025) concluded. Their results confirmed that despite the theoretical potential of technology and research and innovation activity, they do not have a clear significant impact on GDP. The study by (Laala & Boumediene, 2018) also showed that there is a gradual adoption of ICT by the Algerian SMEs, often limited to basic technology only, excluding advanced technology.

Conclusion :

This study aimed to investigate the impact of entrepreneurship on economic performance in Algeria through its key indicators, such as the number of SMEs, unemployment, credit to the private sector, and internet access.

The empirical results demonstrate that SMEs exert a positive and highly significant influence on GDP; however, their overall contribution remains modest, in contrast to advanced economies, where entrepreneurship contributes approximately 50-60% of value added (OECD, 2019). This is due to their structural characteristics, 97% of them being VSEs operating in low-productivity, non-innovative sectors. Unemployment was found to have a statistically significant negative effect on GDP, reflecting the underutilization of Algeria's large youth labor force and persistent structural imbalances in the labor market, including the economy's reliance on the non-labor-intensive hydrocarbon sector (representing more than 90% of its national income) and the weak capacity of the private sector to generate sustainable employment.

Although credit to the private sector shows a positive and significant effect on GDP, its role in driving growth is limited by the inefficiency of financial intermediation, with much of the funding directed toward non-productive activities rather than high-value investments. Internet access, as a proxy for technological development, was found to have no significant effect on GDP, underscoring the limited technological adoption among Algerian SMEs and the slow integration of advanced ICT into business processes.

Overall, the findings highlight that fostering sustainable economic performance in Algeria requires comprehensive structural reforms to promote entrepreneurship, strengthen the role of SMEs, enhance labor market efficiency, improve the allocation of credit toward productive sectors, and boost technological adoption within enterprises. Strengthening entrepreneurial activity, particularly through the creation of innovative and dynamic enterprises, can act as a powerful driver of innovation, resilience, and competitiveness, thereby enabling the Algerian

Investigating Entrepreneurship as a Driver of Economic Performance: An Econometric Analysis of the Algerian Case

economy to transition toward higher, more sustainable, and more diversified performance.

Appendices

Variable	VIF	1/VIF
-----+-----		
LHDI	31.18	0.032072
LSME	29.12	0.034341
LCrePS	22.04	0.045372
LEmpSME	14.67	0.056593
LNet	9.19	0.108814
LUnemp	3.18	0.314465
-----+-----		
Mean VIF	18.23	

Variable	VIF	1/VIF
-----+-----		
LCrePS	7.82	0.127800
LSME	6.66	0.150238
LNet	4.52	0.221083
LUnemp	1.03	0.967000
-----+-----		
Mean VIF	5.01	

Skewness and kurtosis tests for normality

----- Joint test -----					
Variable	Obs	Pr(skewness)	Pr(kurtosis)	Adj chi2(2)	Prob>chi2
-----+-----					
resids	30	0.4262	0.3590	1.59	0.4518

Breusch-Pagan/Cook-Weisberg test for heteroskedasticity

Assumption: Normal error terms

Variable: resids

H0: Constant variance

chi2(1) = 1.42

Prob > chi2 = 0.2335

Investigating Entrepreneurship as a Driver of Economic Performance: An Econometric Analysis of the Algerian Case

Breusch-Godfrey LM test for autocorrelation

lags(p)	chi2	df	Prob > chi2
1	7.059	1	0.0709

H0: no serial correlation

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