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Algerian Economy (2000-2020): Reconciling Growth, Sustainability and Digitalization

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Abstract:

The objective of this paper is to analyze the joint impact of the green economy and the digital economy on economic growth in Algeria over the period 2000-2020, through the identification of key determinants that influence economic growth in the Algerian context, such as gross fixed capital formation, the working population, variables representative of the green economy, namely greenhouse gas emissions and renewable energy consumption (hydroelectricity), and variables representative of the digital economy, the number of Internet users and broadband or high speed access internet subscribers. The results of the econometric modeling showed that the variables representing the digital economy and hydroelectricity consumption had no effect on economic growth. Nevertheless, the regression showed a positive and significant effect of the variables: active population, gross fixed capital formation and greenhouse gas emissions on economic growth in Algeria. However, greenhouse gas emissions are often associated with climate change and environmental risks. Algeria needs to balance economic growth with sustainable practices to minimize the negative impact on the environment.

Keywords: Green economy, digital economy, economic growth, GDP, Algeria, environment.

1- Introduction

A country's economic development is a complex web woven by a variety of factors, from investment to digital innovations and the management of environmental resources. In the context of Algeria's economy, known for its dependence on fossil energies, this study looks at the unique and new dynamic between the green economy and the digital economy to shed light on the drivers of economic growth. Over the last two decades, between 2000 and 2020, Algeria has experienced a distinctive economic trajectory. Its economy has been shaped by a complex combination of factors, ranging from the traditional imperatives of investment and the working population to the contemporary emergence of the green and digital economies. By carefully analyzing the determinants of this growth, including investment, the labor force, greenhouse gas

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emissions, renewable energy consumption (hydroelectricity), as representative variables and determinants of the green economy, and the number of internet users and broadband (high speed access) subscribers, as representative variables and determinants of the digital economy, this research aims to provide an in-depth perspective on the forces shaping Algeria's economic landscape. Through empirical study and in-depth analysis, we explore the impact of these variables on economic growth in Algeria, offering crucial insights for strategic economic and environmental policies. This study sheds valuable light on how Algeria can move towards sustainable economic growth, balancing environmental imperatives with the opportunities offered by the digital revolution.

1.1 Issue: At the heart of this study is the fundamental question of how Algeria can navigate the economic dynamics of the new millennium, balancing the need for economic growth with the imperatives of environmental sustainability and the opportunities offered by digitalization. *How do traditional variables such as gross fixed capital formation and the working population interact with the new parameters of the green and digital economy to shape the country's economic trajectory?* In answering this question, we aim to offer informed recommendations to guide economic and environmental policies for sustainable and inclusive growth in Algeria.

1.2 Objective: the main objective of this study would be to analyze the joint impact of the green economy and the digital economy on economic growth in Algeria over the period 2000-2020, through the identification of key determinants, such as gross fixed capital formation, the working population, greenhouse gas emissions, renewable energy consumption, the number of Internet users, and broadband subscribers, that influence economic growth in the Algerian context. This will provide informed recommendations for economic and environmental policies to promote sustainable economic growth in Algeria.

1.3 Hypotheses: In order to answer the above question, two hypotheses have been put forward:

H1: The determinant of the green economy, consumption of renewable energy (hydroelectricity) has a non-significant impact on economic growth in Algeria.

H2: The determinant of the green economy, greenhouse gas emissions has a positive and significant impact on economic growth in Algeria.

H3: The determinants of the digital economy have an insignificant impact on economic growth in Algeria.

H4: Investment has a positive and significant impact on economic growth in Algeria.

H5: The working population has a positive and significant impact on economic growth in Algeria.

1.4 Methodology: To test the hypotheses put forward, we carried out a multiple regression using the classic production function with economic growth as the explained variable, represented by gross domestic product (GDP) and the two explanatory variables, capital represented by investment through gross fixed capital formation (FBCF) and labor represented by the active population (EMPL). In addition to these variables, we have added two economic growth indicators, the green

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economy represented by two variables: renewable energy consumption (hydroelectricity) (COHYELC), and greenhouse gas emissions (EGESER). The second variable is the digital economy, represented by the number of Internet users (per 100 inhabitants) (INT) and the number of high-speed Internet subscribers (NBRINT). These variables have been carefully selected to capture the impact of the green and digital economies on economic growth in Algeria.

2- Conceptual framework of the study

Before proceeding to estimate the econometric model, we will define the key concepts of this study: the green economy and the digital economy.

2.1 Green Economy

2.1.1 Definition: The green economy, also known as the sustainable economy, is defined as the set of trends towards a low-carbon economy that enables human and natural ecosystems to live in symbiosis[1] . It refers to an economic model that aims to integrate practices that respect the environment, promote the sustainability of natural resources and reduce the ecological impact of economic activities[2] . The green economy is the subject of an almost worldwide craze in institutional reports, at all levels of territory. Companies are openly embracing it as part of their approach to corporate social responsibility. The green economy is in fact a political economy whose objective is the ecological and energy transition towards sustainable development[3].

2.1.2 Key elements: The elements of the green economy include various areas and practices aimed at integrating environmental sustainability into economic activities:

- *Renewable energy*: Use of clean, renewable energy sources such as solar, wind, hydro and biomass.
- *Energy efficiency*: Adoption of technologies and practices aimed at reducing energy consumption and optimizing its use.
- *Sustainable management of natural resources*: Preservation of ecosystems, responsible use of natural resources and promotion of biodiversity.
- *Recycling and waste management*: Encouraging reuse, recycling and responsible waste management to reduce the ecological footprint.
- *Sustainable transport*: Promoting environmentally-friendly modes of transport, such as public transport, electric vehicles and cycling infrastructure.
- *Sustainable agriculture*: Adoption of farming practices that respect the environment, such as agro ecology, crop rotation and pesticide reduction.
- *Clean technologies*: Development and use of innovative technologies to minimize the environmental impact of industrial processes.

[1] Gérald Orange. « Dictionnaire collectivités territoriales et développement durable », 2017, PP 172-175.https://www.cairn.info/dictionnaire-collectivites-territoriales-et-develo--9782743022358-page-172.htm

[2] Valérie Boisvert et Jean Foyer. « Regards croisés sur Rio+20 », CNRS Edition, Paris, 2019, PP 139-161. https://books.openedition.org/editionscnrs/26253

[3]Gérald Orange, 2017, PP 172-175.

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- *Environmental standards and certifications*: Introduction of standards and certifications to encourage companies to adopt more sustainable practices.
- *Green investment*: Encouraging investment in projects and companies that promote environmental sustainability.[4]

2.2 Digital Economy

2.2.1 Definition: The digital economy refers to an economy based on the intensive use of information and communication technologies (ICTs). It encompasses all economic activities that are facilitated by digital technologies, including the Internet, software, data, social networks, e-commerce and other technological innovations[5] . The digital economy is transforming traditional business models, fostering innovation, and influencing production, distribution and consumption patterns. It is characterized by increased interconnection, automation and the dematerialization of goods and services[6].

2.2.2 Key elements: The elements of the digital economy are varied and encompass a range of activities and technologies related to the use of digital tools:

- *Internet and Connectivity*: The foundation of the digital economy, enabling communication, access to information and collaboration on a global scale.
- *E-commerce*: The buying and selling of goods and services online, including sales platforms, electronic marketplaces and electronic payments.
- *Information and Communication Technologies (ICT):* Includes software, hardware, communication networks, databases and other technologies that facilitate information processing.
- *Technological innovation*: The development and use of emerging technologies such as artificial intelligence,block chain, the Internet of Things (IoT) and virtual reality.
- *Cloud services:* Data storage and access on remote servers, for greater flexibility and mobility.
- *Social networks*: Online platforms enabling individuals and businesses to share content collaborate and communicate.
- *Digital business transformation*: The integration of digital technologies into business processes to improve efficiency, innovation and competitiveness.
- *Big Data:* The collection, storage and analysis of vast sets of data to generate useful information and knowledge.
- *Teleworking and online collaboration*: The use of technologies to enable remote working and virtual collaboration.

[4] L Bak, H Solis, G Kleisterlee, AGurria. «Notre planète », Revue du programme des Nations Unies pour l'environnement PNUE, février 2010.

[5] A Courmont, D Galimberti. « Dictionnaire d'économie politique », 2018, PP 187-192.https://www.cairn.info/dictionnaire-d-economie-politique--9782724623109-page-187.htm

[6] N Colin, A Landrier, P Mohnen, A Perrot. «L'Economie Numérique», Notes du conseil d'analyse économique, 2015/7, N°26, PP 01-12.https://www.cairn.info/revue-notes-du-conseil-d-analyse-economique-2015-7-page-1.htm

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- *IT security*: Measures and technologies designed to protect data and systems against digital threats[7].

3- The importance of Green Economy and Digital Economy: Previous Studies

Studying the impact of the green economy on economic growth is of paramount importance in the current context of global environmental concerns. By examining how sustainable and environmentally friendly economic practices influence growth, we can better understand the mechanisms that promote both economic progress and the conservation of natural resources.

A number of studies have examined the impact of the green economy on economic growth. In 2012, author M. Behmane published a study entitled "*Renewable energy consumption and economic growth in Western Europe*", the aim of which was to explore the long-run and short-run causal relationship between renewable energy consumption and economic growth in Western European countries for the period 1995-2010. The results of the econometric tests revealed the existence of a bidirectional relationship between renewable energy consumption and economic growth in the short and long term. The author deduced from the results that these countries can use renewable energy instead of oil to reduce foreign dependency[8] .

In 2017, S. Djeddi's doctoral thesis on "*the impact of renewable energies on the energy transition and their role on economic growth in Algeria during the period 1980-2014*", aimed to indicate the impact of renewable energies on economic growth in Algeria during the period from 1980 to 2014. To do this, a production function was estimated by adding the variables energy consumption and renewable energy consumption. The results indicated the absence of impact of the two variables energy consumption and renewable energy consumption on economic growth during the period 1980-2014 and a strong impact of the variable capital on economic growth during the same period. The author concludes that Algeria could proceed with energy efficiency practices since reducing fossil fuel consumption will have no effect on economic growth[9] .

In 2021, authors C. Moummy, Y. Salmi and H. Baddih, also studied the impact of renewable energy consumption on economic growth in Morocco over the period 1990-2017 with their publication entitled "*l'impact des energies renouvelables sur la croissance économique: analyse empirique au cas marocain*". The objective was to test the causal relationship between renewable energy, represented by renewable electricity generation, and economic growth. The econometric model was composed of several explanatory variables for economic growth, including CO2 emissions. The

[7] M Bourreau, T Pénard. « L'Economie Numérique en question », Revue d'Economie Industrielle, N°156, 4 ième semestre, PP 11-15.https://journals.openedition.org/rei/6437

[8]M. Behmane. « laconsummation d'énergie renouvelable et la croissance économqiue dans l'Europe de l'Ouest », Department of Economics of Firdawsi University of Mashhad, Iran, 2012. https://revecon.ro/articles/2012-2/2012-2-10.pdf

[9]S. Djeddi. « Rôle des énergies renouvelables dans la transition énergétique et leur impact sur la croissance économique en Algérie durant la période 1980-2014 ». Thèse de Doctorat, Ecole Nationale Supérieure de Statistiques et de l'Economie Appliquée, 2017.

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results revealed a strong cointegration between the variables, as well as the role of economic growth and trade openness in the deployment of the renewable energy sector[10] .

In 2022, the author D. Hamitia published an article entitled "*Analysis of the impact of energy consumption on economic growth in Algeria*". The aim was to analyze empirically the effects of renewable and non-renewable energy on economic growth in Algeria, for the period 1990-2019, using the ARDL model. The results obtained show that there is a link between energy consumption and economic growth in Algeria, and indicate that the consumption of renewable energies is beginning to have a positive impact on the economic factor of sustainable development, and that the country is moving towards a diversification of these energy resources in the coming years[11].

Studying the impact of the digital economy on economic growth, for its part, is just as crucial in the modern era. Understanding this impact makes it possible to anticipate profound transformations in traditional sectors, while identifying new opportunities. Information and communication technologies (ICTs) play a central role in business efficiency, driving innovation, automation and access to new markets.

The study by A. Kadi, published in the journal des sciences commerciales and focusing on "*the impact of information and communication technologies (ICTs) on global economic growth and their place in the Algerian economy*", aimed to test the impact of ICTs on economic growth in different countries around the world, depending on the country's level of development. The results showed that at global level, ICTs contribute directly to economic growth through investment and job creation. For developed countries, they represent an opportunity for growth and a means of consolidating their economies. For emerging countries, ICTs are an effective means of consolidating their economies and accessing new opportunities on international markets[12] .
In 2019, JH Wamba and BL Nadjie published a study on the "*Digital economy and economic growth in Cameroon*". The aim was to provide a new vision for understanding the digital economy represented by ICTs as a lever for economic

[10]C. Moummy, Y. Salmi et H. Baddih. « L'impact des énergies renouvelables sur la croissance économique : analyse empirique au cas marocain », Journal d'économie, de management, d'environnement et de droit JEMED, Vol 4/1, Février 2021.file:///C:/Users/pc/Downloads/27688-73360-1-PB.pdf

[11] D Hamiti. « Analyse de l'impact de la consommation d'énergie sur la croissance économique de l'Algérie ».El BahithReview, Vol 22/1, Décember 2022.file:///C:/Users/pc/Downloads/819-Article%20Text-1343-1-10-20230113%20(1).pdf

[12] A. Kadi. « L'impact des technologies d l'information et de la communication TIC sur la croissance économique mondiale et leur place dans l'économie Algérienne », la revue des sciences commerciales, PP 179-197. https://www.asjp.cerist.dz/en/downArticle/360/6/2/49819

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growth. The results showed a substantial impact of ICTs on indicators such as productivity and the employment rate.[13]

This study looks at the joint impact of the green economy and the digital economy on economic growth. This choice of theme was based on previous studies that have been carried out on these subjects. However, we wanted to test the joint impact of these two concepts on economic growth, since, on the one hand, there is a shortage (to the authors' knowledge) of research on this theme, and also because of the strategic importance of this subject in the contemporary era. While the green economy explores sustainable practices that respect the environment, the digital economy catalyses major technological transformations. Combined, these two areas offer considerable potential for inclusive and sustainable economic growth. An in-depth analysis of the interaction between the two will help to identify possible synergies, such as the integration of digital technologies into green initiatives and the creation of innovative solutions to environmental challenges.

4- Empirical study: Impact of the green economy and the digital economy on economic growth in Algeria 2000-2020

Our econometric study covers a period of 21 years (from 2000 to 2020). Our objective is to measure the impact of the green economy and the digital economy on economic growth in Algeria.

4-1 Variables: the variables have been carefully chosen in order to test the impact of the green economy and the digital economy on economic growth.

The endogenous variable explained

- **Economic growth represented by Gross Domestic Product GDP** (expressed in constant dollars).

The explanatory exogenous variables

- Classical explanatory variables for economic growth (production function) :
  - **Capital represented by gross fixed capital formation (FBCF).** (Expressed in constant dollars).
  - **Employment represented by the working population in Algeria (EMPL)**.
- Variables representative of the green economy :
  - **Greenhouse gas emissions (EGESER)** (expressed in kt of oil equivalent).
  - **Consumption of hydroelectricity as a renewable energy source (COHYELC)** (in millions of tons of oil equivalent).
- Variables representative of the digital economy :
  - **Internet users (INT)** (number of Internet users in one form or another for every 100 inhabitants).

[13]JH Wamba et BL Nadjie ont publié une étude portant sur « Economie numérique et la croissance économique au Cameroun », Hal Open Science, 04/01/2019, https://shs.hal.science/halshs-01970291/document

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- **Subscribers with high-speed internet access (NBRINT)** (number of subscribers with high-speed or broadband Internet access, regardless of the technology used).

The data were collected either from the World Bank's official website[14] or from the Perspective Monde website[15] .

4-2 Econometric model: In order to ensure the linearity of the model, the data used are logarithmic annual data. The use of logarithms will not affect the data or the results of the study. To determine the impact of the green economy and the digital economy on economic growth in Algeria over the period 2000-2020, a production function was estimated, incorporating variables representative of the green economy and the digital economy.

$$\boldsymbol{Y = f(fbcf, empl, egeser, cohyelc, nbrint, int)} \text{.....(1)}$$

$\boldsymbol{Y}$GDP endogenous variable representing the growth rate;
$\boldsymbol{fbcf}$ Gross fixed capital formation;
$\boldsymbol{empl}$ Labor force;
$\boldsymbol{egeser}$ Greenhouse gas emissions;
$\boldsymbol{cohyelc}$ Hydroelectricity consumption;
$\boldsymbol{int}$ Internet users;
$\boldsymbol{nbrint}$ The number of broadband subscribers.
After introducing the logarithm to the variables, the model is written as follows:

$$\boldsymbol{lgdp = c + lfbcf + lempl + legeser + lcohyelc + lnbrint + lint + \varepsilon} \text{..... (2)}$$

$\boldsymbol{lgdp}$ Log of GDP representing the growth rate;
$\boldsymbol{c}$ Constant term;
$\boldsymbol{lfbcf}$ Log of gross fixed capital formation;
$\boldsymbol{lempl}$ Log of the working population;
$\boldsymbol{legeser}$ Log of greenhouse gas emissions;
$\boldsymbol{lcohyelc}$ Log of hydroelectricity consumption;
$\boldsymbol{lint}$Internet user log;
$\boldsymbol{lnbrint}$Log of the number of broadband subscribers;
$\boldsymbol{\varepsilon}$ The term error.

[14] https://www.worldbank.org/en/country/algeria
[15] http://perspective.usherbooke.ca/

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4-3 Estimation:

Step 1: Study of the stationarity of the variables

To check the stationarity of the series studied, we used the unit root test: ADF (Augmented Dickey-Fuller). After processing the data with the software, we obtained the following results:

Table 1: Stationarity of the series

	LEVEL		1st difference		2nd difference	
	t-Statistic	Prob	t-Statistic	Prob	t-Statistic	Prob
lgdp	-3.372728	0.0248				
lnbrint	-2.390200	0.1579	-2.864356	0.0684	-5.110428	0.0008
lint	2.913224	1.0000	-2.375359	0.1011	-3.728094	0.0145
legeser	-1.315176	0.6015	-3.440902	0.0223		
lcohyelc	-3.319820	0.0276				
lempl	-3.809516	0.0095				
lfbcf	-1.506365	0.8023	-3.466365	0.0287		

Source: Compiled by the author from EVIEWS10 results

We note that all the variables are stationary (in level, in first difference) at a significance level of 5% except for the NBRINT and INT variables which are stationary in first difference at a significance level of 10%, and they are stationary in second difference at a significance level of 5%.

Stage 2: Econometric formulation and estimation of model parameters

The multiple modelingis based on the following assumptions, which we assume to be true.

1- Stochastic assumptions :

- H1: the X values$_{it}$ are observed without error.
- H2: E (εt)=0 the mathematical expectation of the error is zero
- H3 : E (εt)= $\sigma^2\varepsilon$ the variance of the error is constant (homoscedasticity)
- H4: E (εt,ε't) = 0, if t ≠ t', the errors are uncorrelated (no autocorrelation of residuals).
- H5: Cov (xtt, εt)=0 the error is independent of the explanatory variables.

2- Structural assumptions :

- H6: absence of collinearity between the explanatory variables, which implies that the matrix (X' X) is regular and that the matrix $(X' X)^{-1}$ exists.
- H7: (X'X)/n tends to a finite and non-regular matrix.
- H8 : n>k+1, the number of observations is greater than the number of explanatory series.

After entering the data, the first estimates obtained are as follows:

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Table 2: Initial multiple regression results

DependentVariable: LOGGDP

Method: Least Squares

Date: 09/09/23 Time: 08:25

Sample (adjusted): 2000 2020

Includedobservations: 21 afteradjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.670334	0.521344	12.79449	0.0000
LNBRINT	0.000830	0.009007	0.092204	0.9278
LINT	0.000289	0.000290	0.997499	0.3343
LEGESER	0.195160	0.086819	4.444000	0.0200
LCOHYELC	0.032411	0.067123	0.482867	0.6362
LEMPL	0.254025	0.087616	2.899296	0.0110
LFBCF	0.762941	0.106452	9.933654	0.0000

R-squared	0.895297	Meandependent var	11.14244
Adjusted R-squared	0.893730	S.D. dependent var	0.083301
S.E. of regression	0.006596	Akaike info criterion	-6.969690
Sumsquaredresid	0.000653	Schwarz criterion	-6.671255
Log likelihood	79.18174	Hannan-Quinn criter.	-6.904922
F-statistic	634.9307	Durbin-Watson stat	1.512737
Prob(F-statistic)	0.000000		

Source: Compiled by the author from EVIEWS10 results

The initial results of the regression indicate that the coefficients of determination are very satisfactory, with a value of 89%. We also note a positive and significant constant. The explanatory variables that are significant in this estimation are the greenhouse gas emissions variable **legeser**, the active population **lempl** and gross fixed capital formation **lfbcf**. The coefficients of these three variables are positive, hence their positive effect on economic growth in Algeria.The proposed model can be considered significant because the value of the F statistic is significant at the 1% level. This allows us to suggest that the proposed explanatory variables explain the variable under study (**gdp**).

Step 3: Elimination of insignificant coefficients and conclusion of the ideal model: In order to conclude the ideal model and remedy any shortcomings in the initial results, the final stage of this regression consists of eliminating the non-significant explanatory variables, one by one, starting with the one with the highest probability, until we obtain a model containing only significant explanatory variables.

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Table 3: Final results of the multiple regression

DependentVariable: LOGGDP

Method: Least Squares

Date: 09/09/23 Time: 08:30

Sample (adjusted): 2000 2020

Includedobservations: 21 afteradjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.206617	0.137522	45.13167	0.0000
LEGESER	0.098547	0.030025	6.544157	0.0000
LEMPL	0.121165	0.037490	6.032607	0.0000
LFBCF	0.798871	0.030443	29.19799	0.0000

R-squared	0.894900	Meandependent var	11.14244
Adjusted R-squared	0.894333	S.D. dependent var	0.083301
S.E. of regression	0.006271	Akaike info criterion	-7.174260
Sumsquaredresid	0.000708	Schwarz criterion	-7.025042
Log likelihood	78.32973	Hannan-Quinn criter.	-7.141876
F-statistic	1755.632	Durbin-Watson stat	1.608181
Prob(F-statistic)	0.000000		

Source: Compiled by the author from EVIEWS10 results

After discarding the non-significant variables (Table 2), we carried out a second estimation (Table 3), retaining only the significant variables: legeser, lempl and lfbcf. The results indicate a very satisfactory coefficient of determination. The value of F-statistics is significant at the 1% level.

4-4 Results and Discussion :

- Interpretation of significant variables :

For the variable Gross Fixed Capital Formation lfbcf: The positive and significant effect of the variable *Gross Fixed Capital Formation* on economic growth is explained by the key role of investment in economic development in Algeria. An increase in investment in fixed capital, such as infrastructure and equipment, can boost productivity, encourage innovation and strengthen the competitiveness of businesses. Hence the acceptance of hypothesis 4.

For the working population variable lempl: The positive and significant effect of the *working population* variable on economic growth can be explained by the role of the labor force in increasing the production of goods and services in Algeria. A working population offers a greater diversity of skills and talents, encouraging innovation and productivity. It generates income, thereby stimulating domestic

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demand through consumption, which can promote economic growth by encouraging production to meet that demand. Hence the acceptance of hypothesis 5.

For the greenhouse gas emissions variable legeser: The positive and significant effect of *greenhouse gas emissions* on economic growth could be associated with increased industrial production or more intensive use of resources, thus stimulating short-term economic growth in Algeria. Hence the acceptance of hypothesis 2.

- Interpretation of non-significant variables :

For the hydroelectricity consumption variable lcohyelc: *The consumption of renewable energy (hydroelectricity)* has no effect on economic growth in Algeria. This is due to the heavy dependence of the Algerian economy on fossil energy sources such as oil and gas. This result is complementary to the result of the significance of the *greenhouse gas emissions* variable, since Algerian industry uses fossil energy sources almost exclusively in the production of goods and services. Hence the acceptance of hypothesis 1.

For the determinants of the digital economy variable lint and lnbrint: (*the number of Internet users* and *subscribers to broadband access*) are not significant, which shows that these variables do not make a statistically significant contribution to explaining the variation in economic growth. In the Algerian context, this result may be due to the immaturity of the digital sector and the use of ICTs in Algeria. In fact, digital infrastructures that are not sufficiently developed a shortage of digital skills and government policies that are not very encouraging may be the source of the digital economy's lack of significant impact on economic growth. Hence the acceptance of hypothesis 3.

5- Conclusion

Our econometric study confirms the Algerian economy's dependence on non-renewable energy, also called fossil fuels, as the main source of energy for consumption and industrial production, and consequently, as a major component of GDP and resources. Indeed, despite Algeria's considerable efforts at economic diversification, whether through the development of renewable energies or the digital economy, their impact on economic growth remains absent. Nevertheless, the positive and significant effects of the variables *greenhouse gas emissions* and *gross fixed capital formation* on economic growth represent proof of an increase in investment, infrastructure and equipment, and also of a dynamic in industrial production, since greenhouse gas emissions are the result of the combustion of fossil fuels. However, these emissions are often associated with climate change and environmental risks. Algeria needs to balance economic growth with sustainable practices to minimize the negative impact on the environment.

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