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Analysis of the Impact of Industries on Senegal's Economy

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Abstract
In this study, the researcher seeks to use empirical data to analyze the impact of industries on the Senegalese economy. The paper used secondary data from the World Bank and Senegal's National Statistics and Demography Agency (ANSD) and covered the period between 1960 to 2016.The research employed the specification model and selected variables underlying the hypotheses for the study in prior expectations. The methodology used for the study is descriptive analysis. At the end of this study, it was be concluded that the methodology adopted was the participatory method, which is an interactive research model based on both theoretical and empirical analyzes. The ARDL most revealed short-and long-term correlations between variables were also used to determine the impact of the industrial sector on Senegalese economic growth as well as the factors that influence it. Between 1980-2016, empirical research was conducted to examine the industrial sector and its impact on economic growth.
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Introduction

Industrialization, which became a focal point of structural change throughout the economic revolution, has continued to expand employment and output levels, resulting in previously unheard-of profit increases. Encouragement of the industrial sector's development is essential for long-term development. In the literature on growth and development, it is now well established that industrial expansion is linked to GDP growth. (Pacheco-Lopez and thirlwall, 2013). Without industrialization capable of adding value, African countries, like other developing countries, will not be able to create the wealth they need to eradicate poverty. Manufacturing is commonly used as a synonym for the industry in Africa, as it is in many other developing nations. Raw materials are generally transformed into higher-value products through this process. By contrast, the industry refers to organized human knowledge that aims to transform natural resources and raw materials into something more valuable and useful. This is where manufacturers come in.

Senegal has adopted several industrial development policies to emphasize the sector and boost economic growth and income redistribution since independence, but the outcomes have been varied. Few studies examine how these factors impact Senegal's economic development, such as that conducted by the World Bank (2012). The impact of industrialization on Senegal's economic development is examined in this article. To carry out this current investigation, I will first present the literature review. The research technique and strategy will then be discussed in the second section, which will look at the model definition and selected variables, the variables' underlying assumptions and apriori expectations, the method of data analysis and data collecting, and ultimately the research hypothesis. The discussion and empirical results will be discussed in the last section.

1. Literature Review

Since the Industrial Revolution in England in the two and a half centuries, industrialization has had more effects on the entire world than any other process. This complex was not introduced equally in all countries, nor did it happen at the same time or the same pace. Industrialization is still commonly viewed as an unavoidable growth route for developing countries trying to construct a modern economy with a high quality of life. It's even used interchangeably with the term "development." (e.g. Gillis et al. 1996). The goal of this study is to perform a literature analysis on industrialization and its effects on economic growth.

1.1. Conceptual Framework

1.1.1. Concept of Industrialization

Industrialization may be defined in two ways: as a movement in a country's production and workforce model toward manufacturing or secondary industry, or as a shift in the production and workforce model away from manufacturing (Clunies-Ross, Foresyth, and Huq, 2010). It can also be characterized in terms of attaining a given revenue level. Industrialization, according to O'Sullivan and Sheffrin (2007), is the sociological and economic transition that converts a human being from a farmer to an industrialist. Modernization, large-scale energy development, and metallurgical production, they claim, are three ways that industries are bringing about

change. These factors are inextricably tied to economic development. They also say that the sociological process of rationalization is brought on by industrialisation. Various tactics for promoting industrial growth have been employed over time. Balanced growth, unbalanced growth, import substitution, and export promotion are the four options. According to Balami (2006), the industry is understood as a grouping of firms or groups of firms that produce identical or similar products. The industry, according to Alfred Marshal, is a collection of separate businesses that produce equal or comparable goods and services. He went on to say that industry is concerned with the wealth-generating actions of individuals in a firm. The concentration of industry in a certain region is then referred to as industrialization.

1.1.2. Concept of Economy Growth

In economics, economic growth has been conceptualized as an increase in the per capita income of a population over time (Clunies-Ross, Foresyth, & Huq, 2010; Jhingan, 2005; Abbott, 2003). Traditionally, economic growth, represented by GDP, has been viewed as an economic development that increases an economy's capacity to produce goods and services for its citizens to improve their well-being. At the same time, Balami (2006) discusses economic growth, which is always a close approximation of GDP and is generally defined as an increase in an economy's capacity to generate the commodities and services required to enhance the economy. the citizens of the country's well-being. Growth is viewed as a continuous process that involves increasing the amount of goods and services produced in the economy, such as a growth in the gross domestic product (GDP). When the pace of growth exceeds that of the population, it is noteworthy because it must result in an improvement in human well-being. As a result, growth is viewed as a continuous process of expanding the economy's productive capacity and hence national wealth, as evidenced by increased rates of output per capita and total factor productivity, particularly labor productivity. He also claimed that there are three different types of economic growth measures: nominal growth, real production growth, and growth measured in per capita values. Bolaky (2011) summarizes a number of empirical and theoretical arguments in favor of and against industrialization. It marks a historical shift from an agricultural to a manufacturing-based economy. The things that people generate (economic output) and the job that they undertake for a livelihood are therefore two elements of industrialization (economic activity). Although the literature varies, some empirical research has recognized that there is a link between industrialization and economic development. In both developing and advanced countries, according to the literature, the industry tends to play a larger role as a growth engine. For a country to thrive economically, it must change its economic structure in the hopes of boosting the industrial sector's productivity from the bottom up. Almost every instance of rapid and persistent economic growth has been linked to industrialization, particularly the expansion of manufacturing production (Szirmai 2009).

This decrease, however, obscures the industrial sector's true contribution to economic development. This contribution remains of primary importance for at least three reasons: 1) industrial output derives production from services for high value-added industry; (2) industrial output remains one of the primary drivers of spending on research and development and investment that drives productivity growth; industrial production is also still the main driver of exports. Thus, the industrial sector is fueling three fundamental sources of growth: demand, productivity gains, and commodities (Sarah Guillou, 2016).

The transformation of raw resources into completed consumer goods or intermediate or manufactured items is what industry is all about in this subject. Industrial operations promote agriculture, provide jobs, and diversify the economy, and they may also help countries build their foreign exchange reserves by assisting local employees in learning new skills. The degree of the industry is a metric that indicates how well the other components of the sector are utilized (Kaldor, 1967).

2. Methodological considerations and approach

2.1 Model Specification and selected variables

The significance of Senegal's industrial growth is examined in this section. Following a study of literature, a model was created to explain these changes using a variety of factors that may influence Senegal's economic growth. The influence of the industrial sector on growth in Senegal is examined using Kaldor's economic model, with the first law of production serving as the key to growth.

According to the first law, industrial production (IND) and GDP growth are positively related.

Equation 1 represents Kaldor's first law

(1) $qi = ai + bimi$

The subscript g represents growth over the period under investigation, where q and m correspond to total and industrial production growth, respectively. Let GDP represent q and IND represent m.

It is required to include a regulatory variable from literature research to see if there are any elements that might contribute to Senegal's economic growth. The following is the updated model specification:

GDP = f (IND, INF, FDI, M2)

Where:

GDP = Gross Domestic Product

IND = Industrial Output
INF = Inflation Rate
FDI = Foreign Direct investment
M2 = Broad Money Supply
In linear function, the model is specified as:
GDPt = λ0 + λ1INDt +λ2INFt + λ3FDIt + λ4M2t +et
GDP is the dependent variable, while IND, M2, FDI, and INF are the independent variables; the constant term is λ0, the regression equation parameters are λ, and the error term is et.
To get better results, we'll use the log function, which is written as follows:

$$LGDP_t = \lambda_0 + \lambda_1 LIND_t + \lambda_2 LINF_t + \lambda_3 LFDI_t + \lambda_4 LM2_t + e_t \quad 3$$

L represents the log function of the variables under investigation and λ is represents the variables parameters.

Table 1: description of Main variables

Variables	Proxy
GDP growth rate (GDP)	GDP growth rate in percent terms at market prices primarily based on a consistent national foreign money. The gross price introduced of all producers, which include all product taxes and subsidies, equals a financial system's GDP.
Industry value-added (IND)	As a proportion of regular national currency, value added in the local economy. Value added is contributed through mining, production, creation, energy, water, and gas. Total output minus middleman intake equals an area's value added.
Broad money supply (M2)	Noncentral government demand deposits, time and savings deposits of resident sectors, federal government foreign currency deposits, travelers' checks, and commercial paper are all included in the wide monetary aggregate, in addition to nonbank currencies.
Inflation GDP deflator (INF)	Every year growth rate of the implicit GDP deflator is used to calculate the price of fee alternate in the economy. GDP in contemporary countrywide currency divided by means of GDP in steady country wide foreign money is the implicit GDP deflator.
Foreign direct investment (FDI)	The reporting economy's net foreign funding flows (new investment inflows minus disinvestment) are divided through GDP.

Source: author's own compilation based on the Word Bank data

2.2 The variables assumptions and expected signs

The following are the basic underlying assumptions and expectations for the variables, which will be estimated in this study:

Foreign direct investment is important for economic development as it enables superior technology, huge capital expenditure, superior production techniques, marketing and distribution capabilities, and technical expertise (Mugabe, 2005). As a result, FDI in Senegal is expected to have a positive relationship with GDP.

Much of the raw materials used by the country's industrial sector, especially the manufacturing sector, are imported. The result is that the movement of exchange rates often affects manufacturers. In other words, when the exchange rate appreciates, the costs of importing raw materials decrease, while when the exchange rate depreciates, these costs increase.

Therefore, the coefficient of the foreign exchange rate should be positive.

The advantageous courting among industrial product (IND) and domestic product quantity is said to be because of business development, which lets in local buyers to have interaction in the efficient sector of the economy, resulting in IND increase. Inflation (INF) is projected to be negative since, all else being equal, a rise in economic growth must lead to a decrease in inflation.

Inflation is a result of an excess of money "searching" for an inadequate range of products. As a result, the decrease in the prices of goods is because the number of goods produced rises. Similarly, the rate of change in output (i.e., economic growth) and the rate of change in prices (i.e., inflation rate) are both dependent on the

amount of production. Broad money (M2) should, in theory, have a positive connection with true GDP. Shortly, real GDP has a positive impact on the money supply. However, this impact will fade with time.

2.3 Method of data analysis

The industrial sector has various effects on the economy, according to Kaldor's laws. According to Kaldor's first law, the industrial sector is the engine of economic expansion. As a result, the higher the national economy's output, the quicker it will expand. A modified Dickey-Fuller unit root test (ADF), an autoregressive distributed shift model (ARDL), and a Pairwise Granger causality test were used to investigate the influence of industrial sector production on the economy. Identifying if a time series is stationary is the first step towards modeling it. It will also be included as a choice. Perhaps the most well-known is the unit root test. When a time series model contains a unit root, statistical inference difficulties may arise. Unit-roots, for example, are included in random walks. If 1 is a root of the equation of function of a linear stochastic process, it has a unit root. A process like this isn't constantly trending, but it's also not always stagnant. When a process with numerous roots that lie inside a unit circle, that is, with a modulus or absolute value less than one, is differentiated for the first time, it will be stationary; however, it will have to be differentiated multiple times before it becomes stationary. Because of this property, unit root processes are sometimes referred to as difference stationaries. Unit root processes and stationary trend processes are sometimes mistaken. Even though they share many qualities, they differ in several ways. A time series can be non-stationary yet nevertheless, stay stationary if it lacks a unit root. Both unitary and stationary processes have the potential for the average to diminish or rise over time. The presence of a unit root may be evaluated using an Augmented Dickey-Fuller (ADF) test when stationary processes are reversed by shock. The unit root test is used to determine the order of integration among the research variables. In general, many macroeconomic variables have a unit root, suggesting that they are not stationary. They must be distinguished in such circumstances to prevent the possibility of erroneous regression.

The ARDL may be linearly transformed into a dynamic error correction model (ECM). Without sacrificing long-term information, the ECM blends short-term dynamism with long-term equilibrium. The ECM test was performed to determine the speed with which the variables were adjusted to address the disequilibrium that resulted from the shocks. For the short- and long-term coefficients of the variables, the bounded model ARDL is used. The ARDL technique has several advantages over other analytical methods, including the fact that it does not officially require a unit root pretest, that it can obtain both short- and long-term coefficients, and that it can be applied to variables of any order of integration, whether they are pure I (0) and I (1) or mixed variables. It can be used both for small samples of 30 to 80 observations and for large samples of thousands of observations (Pesaran and Shin 1995). The Autoregressive Distributive Shift Model (ARDL) is both simple and reliable. Since IND, INF, FDI, and M2 and GDP have mixed-order integration of 1 (1) and 1 (0), the following ARDL model produces long-run and short-run coefficients.

The term "causation" refers to the link between cause and effect. The cause-and-effect relationship between two variables, such as X and Y, is referred to as "causation." Scientists now have new tools to evaluate cause-effect interactions because of recent breakthroughs in graphical models and causal reasoning (Pearl, 2012). Granger causality modeling, on the other hand, has lately gotten a lot of attention and is being utilized in a lot of studies. Granger causality is described in most econometric pieces of literature as a "concurrent relationship" between two variables when it tends to produce a more precise prediction of the other variable over that of the latter using the past of the former.

Granger causality between two variables does not indicate that there is a true cause-and-effect relationship; as a substitute, it demonstrates that one variable can aid in the prediction of the other.

To investigate correlations between Senegalese economic growth and industrial sector output, the Pairwise Granger causality is used.

2.4 Data collection and description

Secondary data was obtained from the World Bank, the Senegalese National Agency for Statistics and Demography (ANSD), and other organizations. Data was acquired between 1980 and 2016. Senegalese National Agency for Statistics (ANSD) and Senegalese Ministry of Finance and Economic Development provided the information. In reality, the data come from surveys of conditions in industry and the general census of enterprises conducted by the ANSD. In this survey, the industrial sector is diagnosed based on its internal and external situation, its investment dynamics, and its innovation potential. The instruments are based on surveys already conducted in other countries such as Morocco, France, etc. The sampling frame consists of all modern sector companies registered in the CUCI (Unique Information Collection Center). The questionnaire included: (i) general information; (ii) trends in key indicators; (iii) advantages and opportunities; constraints and threats; (iv) financing needs and finally (v) prospects.

The World Bank's (World Development Indicators WDI 2017) are also used to provide annual time series data for 1980 to 2016.

3. Empirical Results and discussion

This part of the research presents the estimation results based on econometric analysis.

There are three stages to the method:

- As a first stage, we analyze the stationary nature of the variables using enhanced Dickey-Fuller tests;
- In the second stage, the bound ARDL model is used to assess the coefficients of short-term and long-term variables;
- In the final stage, we investigate the causal relationship between industrial output and Senegalese economic development using Pairwise Granger causality;

3.1 Stationary Test

To establish the order of integration of the study's variables, the ADF (Augmented Dickey-Fuller) stationary test is used. The test examines if the study's variables are in order of integration with or without trend and intercept.

Table 2: ADF Stationary Test between GDP and its determinants Trend and Intercept using the log function

Level			First Difference			
Variables	ADF Statistic	5% Critical Value	ADF Statistic	5% Critical Value	Order	Remarks
LGDP	-0.2579	-2.945842	-5.184295	-2.948404	I(1)	Stationary
LIND	-0.23714	-2.945842	-4.223478	-2.935001	I(1)	Stationary
LINF	-3.510735	-3.530735	-5.723751	-2.954021	I(1)	Stationary
LFDI	-3.934844	-2.945842	-6.150621	-2.954021	I(0)	Stationary
LM2	-0.449571	-2.926622	-6.275255	-6.175255	I(1)	Stationary

Source: Researcher's compilation from E-views 10

The above table describes the results of verification of ADF unit root among LGDP and its determinants both at the stage and at first differentiation. Except for LFDI, all of the variables, including LGDP, LIND, LINF, and LM2, were non-stationary at the 5% critical value at the level, according to the estimated findings. However, these findings revealed that after the initial differencing, all other variables became stable. The ADF statistic and its critical values provide evidence for this claim (stationary when the value of the ADF test statistic is below critical values). Because the series are in the same order of integration, the variables exhibit long-term properties. As a result, their recommendation, variance, and covariance are all constant in the end. As a result, the variables no longer have a unit root at this level, and they may be utilized in the exam search.

3.2 Auto-Regressive Distributed Lag (ARDL) Bounds Cointegration Tests

The Auto-Regressive Distributed Lag (ARDL) limit assessment is used to identify the amount of cointegration of some of the variables, or whether or not there is a longer-term dating of most of the variables to investigate. The ARDL model evolved, with Pesaran and Shin (1999) being the most often used method for examining the rapid and long-term coefficients of execution of the underlying variables. Before a survey may be used, the ARDL model does not require that all variables be integrated in the same sequence. Even if the variables are only partially integrated or if they are integrated with both order one and order zero, the model may be employed. When the data collection is finitely small, the model is also relatively efficient. According to Harris & Sollis (2003), the strategy provides impartial long-run model estimate findings. The ARDL method's results are provided underneath.

Table 3: ARDL Bounds Co integration Test between GDP and its determinants using log function
Dependent Variable: LGDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP(-1)	0.455486	0.164202	2.77394	0.0101
LIND	0.938454	0.051404	18.25661	0.0000
LFDI	0.016981	0.010725	2.583305	0.0254
LINF	-0.002452	0.005076	-0.482948	0.6332
LM2	0.024517	0.026637	3.920423	0.0058
C	1.746786	0.598876	2.916775	0.0072

R-squared	0.997470	Mean dependent variable	22.85249
Adjusted R-squared	0.996218	S.D. dependent variable	0.540902
S.E. of regression	0.033266	Akaike Info criterion	-3.751534
Sum squared residuals	0.028772	Schwarz criterion	-3.351587
Log likelihood	74.65184	F-statistic	1120.392
Durbin-Watson stat	1.548164	Prob(F-statistic)	0.000000

Source: Researcher's compilation from E-views 10

This table above is an illustration of the results of the co-integration of the ARDL bounds between the GDP and the independent variables LIND, LIND, LM2 and LFDI. Model results indicate that industrial production, FDI, money supply, and the constant interest rate all positively influence LGDP at zero lag. As a result, a 1% rise in LIND, LFDI, LM2, and the constant corresponds to 0.938, 0.017, 0.024, and 1.746 increases in the endogenous variable LGDP, respectively. The dependent variable LGDP, moreover, shows a negative association with the rate of inflation. This implies that a 1% increase in INF will translate into a 0.002 reduction in GDP. The t statistic for the inflation rate is likewise lower than the usual value of 2.056 at a significance level of 5%, showing that the inflation rate is the only explanatory variable that does not explain the dependent variable. The constant was found to be statistically significant at 5%, as evidenced by its probability value of 0.0072, suggesting that there are other factors that have a large and positive influence on the LGDP but are not included in this model.

Based on estimates, the coefficient of LIND is 0.938454 with an associated p-value of 0.0000. These results confirm Todaro and Smith's (2011) theory of structural change.

The results are then compared to the findings of Is Industrialization Having an Impact on Economic Growth; ECOWAS Member States' Experience? It uses 10 chosen Economic Community of West African (ECOWAS) nations and roughly the same factors as our analysis to analyze the influence of industry on the economy. The following table summarizes the R-squared results.

Table 4: R-squared summary from the ECOWAS countries's study

Countries	R^2	Adjusted R^2
Nigeria	0.997	0.995
Benin	0.998	0.996
Cabo verde	0.990	0.982
Gambia	0.863	0.777
Sierra leone	0.987	0.976
Liberia	0.987	0.976
Ivory coast	0.992	0.986
Niger	0.990	0.986
Guinea bissau	0.931	0.882
Togo	0.612	0.279

Source: Researcher's compilation from the ECOWAS study

The results are in line with what we found. These models had a significant coefficient of determination (R2) (R2=0.997 or 995 % on average). This means that a number of independent variables, such as industrial production, foreign direct investment, exchange rate, inflation rate, and interest rate, account for 99 % of the variance in the dependent variable, real GDP. Meanwhile, our F ratio is statistically extremely significant, as evidenced by the F statistic estimations of 1120,392 with a probability of 0.0000. It simply means that the R2 value of 0.997 isn't zero. At a 100% confidence level, the explanatory variables industrial production, FDI, M2, and INF have all had a significant influence on Senegal's economic growth. As a result, we discover that between 1980 and 2016, industrial expansion had a significant impact on Senegal's economic growth.

The Durbin-Watson value 1.548 is greater than R2 0.997 and less than 2, suggesting that the model is not false (significant) and that a positive autocorrelation, which suggests a serial correlation, is not present. To further corroborate this claim, we use the Breusch-Godfrey LM serial correlation test.

Table 5: Breusch-Godfrey serial correlation LM test

Breusch-Godfrey Serial Correlation LM Test:			
Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	0.078542	Prob. F (2,24)	0.9247
Obs*R-squared	0.227592	Prob. Chi-Square (2)	0.8924

Source: Researcher's compilation from E-views 10

The chi-square probability test result of 0.8924, which surpasses the crucial threshold of 5% and suggests a serial correlation between the error terms, rejects the null hypothesis of no serial correlation at the 5% significant level. We may conclude that the serial correlation does not exist in the model if we accept the previous hypothesis. Ramsey RESET has also been used to put the model specification to the test. The F-statistic is 0.060191 and the t-statistic is 0.245339, by a p-value of 0.8082, according to the findings. We conclude that the model is properly described because the p-value is larger than the crucial threshold of 5%. We also used the Heteroskedasticity Test: Breusch-Pagan-Godfrey to see if there was any homoscedasticity.

Table 6: Heteroskedasticity Test: Breusch-Pagan-Godfrey

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
Null hypothesis: Homoskedasticity			
F-statistic	2.044161	Prob. F (8,26)	0.0805
Obs*R-squared	13.51406	Prob. Chi-Square (8)	0.0953
Scaled explained SS	8.232247	Prob. Chi-Square(8)	0.4111

Source: Researcher's compilation from E-views 10

Breusch-Pagan-Godfrey confirmed that our model was homoscedastic. The Obs*R-squared value of 13.51406 and prob. 00953 is more than 5%, which is the crucial Chi-Square value, according to the findings.

Table 7: Bound Test

Test statistics	**Value**	K
F statistics	5.768470	3
Critical value bounds **Significance**	1(0) Bound	I (1) Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Source: Researcher's compilation from E-views 10

The results of an ARDL related test between LGDP and its determinants in Senegal, which was used to assess if the variables had a long-term connection, are presented in the table above. The F statistic of the test referenced in the table is 5.768470, which is higher than the critical values of the upper limits (Pesaran, et al, 2001) at levels of 10%, 5%, and even 1% in Pesaran's table (case III: intercept without restriction and no trend, Pesaran, et al, 2001, pp. 300). As a result, we may deduce that GDP, FDI, industrial production, inflation rate, and money supply are cointegrated, implying a long-term relationship.

3.3 Pairwise Granger Causality test

Two variables are frequently studied concurrently when testing for their interaction while testing for Granger causality. One of four possibilities emerges from the analysis:

- Unidirectional Granger causality from variable Yt to variable Xt;
- Unidirectional Granger causality from variable Xt to variable Yt;
- Bi-directional causality and;
- No causality;

Notice that Alpha (α) = 0.05

Decision rule: reject H0 if P-value <0.05; and don't reject H0 otherwise, rejecting the null hypothesis in each case means that the variables have Granger causality.

Table 8: Pairwise Granger Causality between industry and GDP

Null Hypothesis:	Obs	F-Statistic	Prob.
IND does not Granger Cause GDP	35	0.35671	0.045
GDP does not Granger Cause IND		0.46311	0.6337

Source: Researcher's compilation from E-views 10

The results of Pairwise Granger causality test between GDP and industry are shown in the table above. The findings show that GDP and IND production have unidirectional correlations, with causality moving from industry to real GDP. This suggests that IND has a granger effect on GDP. As a result, we infer that Kaldor's first rule of growth holds true in the Senegalese economy, because the direction of causality between industry and GDP growth is from industry to GDP. These findings suggest that any economic strategy that boosts industrial output would boost Senegal's economic development.

Conclusion

We were able to assess the influence of industrial output on the economy in Senegal while integrating other factors impacting the economy using the Augmented Dickey-Fuller stationary test and the short and long run ARDL bound analysis, according to our results (GDP). Senegal's industrial production has a statistically significant influence on economic growth, proving that Kaldor's first law applies to the country. Senegal's economy will benefit greatly from industrialization.

The sign observed in terms of explaining GDP is positive and strong. Industrial production, FDI, money supply, and the constant rate all have positive and substantial effects on GDP at lag zero, according to the model results.

The rate of inflation, on the other hand, has a negative relationship with the dependent variable, GDP. The results also show that the explanatory variable inflation rate alone does not statistically explain the dependent variable.

When compared to the data, the model's coefficient of determination R2 is 0.997, suggesting that it is statistically significant. In other words, the intensity of industrial production, foreign direct investment, inflation rate, money supply, and the constant rate may all explain Senegal's output growth between 1980 and 2016.

Recommendations

Based on my analysis, I propose that Senegal can learn to take advantage of its industrial comparative advantage, attract more FDI and encourage technological spillovers and innovation through the following strategies:

Promote FDI to make the country more attractive, promote good investment drive, promote better trade for the industrial sector, improve the business environment, strengthen human capital (through a diversified training offer), facilitate access to credit for businesses, including long-term loans, promote the development of research and technological innovation, solve the vital problem of energy and infrastructure, and finally build partnerships and reduce information gaps.

As a result, it is also recommended that specific policy measures be used to boost industrial production by increasing overall productivity across all sectors and assuring long-term growth. The government should establish an environment favourable to industrial growth by: reducing structural rigidities in the economy to boost industrial activity; and providing an environment conducive to investment by removing structural rigidities in the economy.

First, ensure a reliable power supply, decent roadways for the transportation of products and people, a functional legal system, life and property security, infrastructure, and other necessities.

Secondly, a good governance structure and a good legal framework to safeguard property rights must be established. Thirdly, to Improve social and economic infrastructure, in particular electricity supply and functional education. It can reduce the cost of production.

Fifty, to boost technology dissemination and increase the competitiveness of Senegalese industry.

Sixthly, improvement of work factors and investment in companies (especially SMEs/SMIs).

Finally, the fight against corruption and an improvement of the regulatory framework to reduce business operating costs.

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