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The Role of Industrialization on Economic Growth: Case of Cameroon from 1986-2020

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Abstract

This paper studies the impact of industrialization on Cameroon's economic growth from 1986 to 2020. The main goal of the study is to explore the impact of industrialization on Cameroon's economic growth. The study adopted a vector error correction model, taking the proportion of manufacturing in the total national economy as a representative variable of industrialization, and discussing its impact on GDP growth. The control variables used include capital and labor. The data used in this article was collected from official statistical agencies such as Cameroon and the World Bank and using the new classic theory and Kaldor theory for analysis. The results of the model show that the increase in the share of manufacturing in the GDP will significantly promote Cameroon's economic growth. Therefore, this paper recommends that the government establish new policy measures to stimulate industrial production and ensure sustainable development.

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Introduction

Modern theories of economic growth emphasize that growth is a process of technological innovation, modernization, and diversification of industry. This improves the various types of infrastructures and institutional arrangements that provide the framework for the development and creation of enterprises, which can be briefly described as the structural transformation of the economy. Industrialization can therefore transform the economic structure into modern economic activities and can be seen as a source of positive externalities for other actors. At the same time, it facilitates economic development. A country's industrial development determines the degree of its economic integration and its inclusion in global value chains. Between 1990 and 2017, the manufacturing sector generated 11.7% of global value-added and more than 70% of the world's exported goods, according to World Bank indicators (2019). Industrialization can be appreciated as an essential tool for creating jobs, stimulating technological progress, reducing poverty, and promoting regional development policies and innovation. Cameroon had a different experience with industrialization because the numbers are not good enough. Indeed, the African Development Bank claims that the economies of Africa in general, and Cameroon in particular, are slowing down due to a lack of industrialization (African Development Bank, 2016). Indeed, over the past two decades, Cameroon has experienced unprecedented economic growth, which has propelled it to the forefront of the world stage. This impressive growth trajectory, however, preceded an abysmal performance after independence, particularly in the 1970s and early 1980s. Cameroon, on the other hand, would need a lot of effort to make its development sustainable and inclusive, as well as a means of accelerating the process of catching up at the level of developed countries. Despite recent development booms in some African countries. The take-off of industrialization requires the availability of an educated and technically qualified workforce, the difficulty of which affects the development process in Cameroon. Other factors known to contribute to the bleak conditions of industrialization in Cameroon are inappropriate industrial investment policies, inadequate infrastructure, the strong footprint of the neo-colonial state, the corruption of public and private actors, the issue of the size of the market as well as the lack of technology (Louis-Marie KAKDEU LibreAfrique: 2018).). It is therefore imperative to create skills, increase productivity, encourage investment, improve business operations and technology transfer, reduce costs in the business climate and introduce appropriate standards to enable products to be competitive in international markets. Patterns of growth over the years have captured the attention of policymakers and researchers. There are massive surveys of the factors underlying economic growth patterns. The effects of trade liberalization and foreign direct investment (FDI) on economic growth have been widely studied (Adams, 2009; Agbloyor & al., (2014); Akinlo, (2004); Onafowora and Owoye, (1998); Sakyi, & al., (2015); Zahonogo, (2017) However, the role of industrialization on Cameroon's economic growth has been neglected or under-explored. The objective of this work is to examine the impact of industrialization on economic growth in Cameroon.

All of these economic and social challenges affect Cameroon's industrial development, as well as economic growth. However, the Cameroonian industry is still dominated by extractive activities, with the manufacturing component representing only 8% of GDP against 20.5% for agriculture, livestock, and fishing and 29.5%. This shows the low importance of the industrial sector in the Cameroonian economy. Cameroon, therefore, has an industrialization problem with multiple origins, even if certain solutions have already been sketched out. Moreover, Cameroon is highly dependent on revenues generated by the extraction and processing of minerals for export and yet it does not export more. In 2015, Cameroon's GDP was expected to be $29.6 billion, about the same as in 2013. This represents an economy that is sluggish and performing well below capacity. Despite a global economic slowdown and security concerns in

the north, Cameroon's economy has proven to be reasonably stable. The objective of this paper is to examine the impact of industrialization on economic growth in Cameroon. This paper will therefore consist of 4 parts. The first chapter will establish the current research topic. The second chapter will contain both theoretical and empirical reviews of the literature, while the third chapter will examine the impact of industrialization on economic growth in Cameroon by analyzing the data using econometric techniques. Chapter four will summarize the conclusion and policy implications for Cameroon.

Literature review

Theoretical review

Economic growth theory

Growth is a fundamental process of contemporary economies, linked to the industrial revolution and the notion of progress. Theoretically, several arguments have been advanced to explain the sources of economic growth. The explanatory theories of growth are relatively recent in the history of economic thought. These theories have led to highlighting the essential role of certain macroeconomic variables in the growth process.

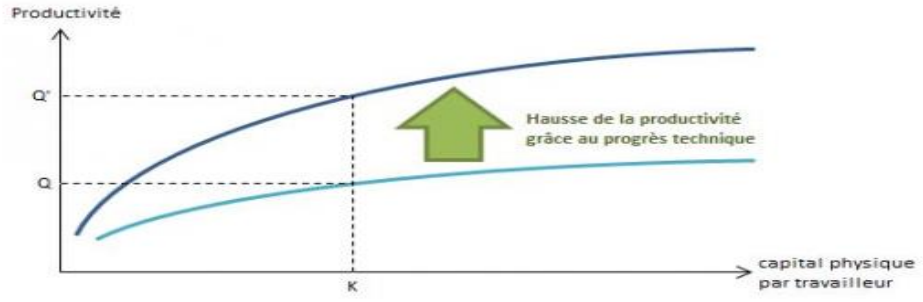
The classical school

The economists of the classical school, writing as late as the beginning of the Industrial Revolution, believed that there could be no sustainable growth, since, in their view, all production must inexorably enter a steady state. This is the case with Ricardo (1821), for whom the steady-state was the result of diminishing returns from cultivable land, or even with Malthus (1798), who related it to his population principle. Smith (1776), however, hinted at the possibility of uninterrupted growth in his study of the productivity effects produced by the development of the division of labor.

Solow's model

From a long-term perspective, Robert Solow produced 1956 the first neoclassical growth model. In this model, firms combine labor and capital to produce goods. They use household savings to invest and thus increase production capacity. Thus, the more the economy saves, the more companies can accumulate capital. However, Solow hypothesizes a decrease in marginal productivities: the more machines a worker has, the less the additional machine allows him to increase his production. In other words, the more the stock of capital increases, the less quickly production increases. Therefore, in the absence of technical progress, growth gradually tends towards zero, and the economy may eventually find itself in a situation where production does not increase anymore but stagnates. Solow thus finds here the idea of the classics according to which the economy converges towards a stationary state.

Figure 2.1: growth curve according to the Solow model



Source: http://economics.wikia.com/wiki/Solow_Growth_Model

In the long run, growth can only come from technical progress: the latter makes it possible to raise the productivity of capital so that the economy delays the moment when it reaches a steady-state. For example, if a worker was able to produce a quantity Q of goods from K machines; thanks to technical progress, it is now able to produce quantity Q ’. Technical progress allows workers to produce more with the same amount of factors. Ultimately, as long as there is technical progress, the economy always generates growth and never experiences a steady state. However, Solow's model suffers from several limitations: He assumes that saving is growth-friendly. However, in the short term, as Keynesians point out, higher savings (hence lower spending) are likely to tip the economy into recession and lead to higher unemployment. According to Keynesian logic, on the contrary, it is the prospect of strong demand that encourages companies to invest. Solow's model highlights the importance of technical progress for long-term growth, but it fails to explain it. Technical progress is "exogenous" in its model, that is to say, independent of the behavior of agents. Paradoxically, according to Solow, growth depends on something he does not know the origin of. Technical progress appears as a “manna” in his model: it “falls from the sky”. It is therefore necessary that new theories manage to explain where technical progress comes from (something that the theories of endogenous growth will do in the 1980s).

Theories of endogenous growth

Appearing in the 1980s, the theories of endogenous growth aim to explain the cumulative nature of growth or, in other words, to explain why certain countries do not manage to initiate a growth process and thus remain in a pitfall development. Just like with Solow, technical progress generates economic growth, but in return, the latter is also likely to generate technical progress. There are three main models of endogenous growth: Robert Lucas (Nobel Prize in 1995) emphasizes the importance of human capital for growth. A worker becomes more productive when he accumulates knowledge and skills, but these do not wear out: human capital is a cumulative factor, which presents increasing returns. So a virtuous circle is at work: the more people obtain new knowledge and skills, the more they can acquire new knowledge of skills. Robert Lucas is content to develop the idea that accumulating human capital allows the worker to be more productive, but we can go further: by accumulating human capital, an individual can innovate, to create ideas, knowledge, and know-how that did not exist before. Paul Romer emphasizes research and development, that is, the accumulation of technological capital. To innovate, a researcher uses the knowledge that is available in his time; by innovating, he increases the knowledge available to other researchers, especially those of future generations. Consequently, the research and development expenses carried out by a company allow it to increase its productivity and innovate; thanks to externalities, they also benefit other companies. So a virtuous circle is at work: by innovating, one company enables other companies to innovate. Robert Barro emphasizes the role that public investment, i.e., the accumulation of public capital, plays in growth: Public infrastructure (roads, airports, public lighting, water supply network, etc.) stimulates the productivity of private actors and, consequently, economic activity. However, as growth occurs, the state also collects more taxes and duties so that it can finance new infrastructure. This creates a virtuous circle: public investment stimulates growth, and growth in turn stimulates public investment. Human capital, research and development, and public investment are thus sources of technological progress. Although all three authors are neoclassical and are hostile to stimulus policies to stabilize economic activity in the short run, their theories suggest that government intervention can improve growth in the long run. They, therefore, advocate structural policy measures (e.g., expanding infrastructure, promoting education, stimulating research and development by granting tax credits to innovative firms, etc.).

Industrialization Theory

Kaldor theory

Kaldor's Laws of Growth are a series of three laws relating to the cause of economic growth. Looking at the countries of the world today and through time, Nicholas Kaldor noted a strong correlation between the standard of living and the share of resources devoted to industrial activity, at least up to a certain level of income. He proposed three laws on these empirical regularities: First GDP growth is positively related to the growth of the manufacturing sector. This is perhaps best expressed in terms of GDP growth being faster the greater the excess of industrial growth over GDP growth: this is when the share of the industry in GDP increases. Second, the productivity of the manufacturing sector is positively related to the growth of the manufacturing sector (this is also known as Verdoorn's law). The argument here is that there are increasing returns to scale in manufacturing. These can be static - where the larger the size of the sector, the lower the average costs - or dynamic through the induced effect of output growth on capital accumulation and technical progress. The effects of learning by doing are also likely to be important. Third, the productivity of the non-manufacturing sector is positively related to the growth of the manufacturing sector. The latter law is the least intuitive and is based on the argument that the non-industrial sector has diminishing returns to scale. As resources are moved, the average productivity of those that remain will increase.

Ray model

According to Ray (1998), the origin of the use of coordination models to explain industrialization dates back to the work of Rosenstein, R. (1943) and to the “Big Push” theory. It explains how the different sectors of the economy are complementary in an industrialization process since it is the presence of these sectors that allows other sectors to sell all their production. By increasing the income of their employees, compared to a situation where there would be no industrialization, firms increase the demand for their products, but also all the others available. So there is a positive externality for other firms to the industrialization of a firm. To take advantage of these externalities, however, there must be a simultaneous investment in all sectors of the economy and proportional to their size to generate sufficient demand for production. It is moreover from the considerable size of the required investment that Rosenstein Rodan's theory takes its name.

Two criticisms are however made by Ray. (1998) at the level of the application of this theory.

- First of all, it underlines the significant size of the investment necessary for the operation of the "Big Push", investment in front of being provided by the government or by international bodies, which is not always possible or desirable.
- On the other hand, he also points out that this investment must be made in proportion to the demand for the goods produced in each sector. Excessively subsidizing one sector over another would not be effective since the production would be more abundant than necessary in one sector and insufficient in another. A “balanced” investment, ie proportional to the demand for the various goods and services, is therefore necessary. In practice, the level of complexity of the economy makes it difficult to know exactly the necessary proportions, making the investment difficult to make.
- Finally, Ray (1998) points out that the situation where there is indeed industrialization is also equilibrium and that in this case, it may be possible to rely partially on the market to achieve it.

Hirschman model

Hirschman (1958) had already provided a solution to the problem of proportional and large-scale investment by proposing to target certain key sectors of the economy which, by industrializing, would lead to the industrialization of other non-subsidized sectors. So rather

than trying to invest in a balanced way in the economy, that is to say in proportion to demand, a less costly strategy would be to identify the key sectors of the economy including the subsidy, by their links with other sectors, which would lead to private investments in other sectors. He also underlines that the externalities generated by the different industries can have an impact on the supply of inputs, thus reducing costs, or on-demand, which complicates the choice of "key industries". Subsidizing an industry that feeds the demand for goods supplied by another industry has a significant and direct impact on the latter. On the other hand, subsidizing an industry supplying products to other industries reaches a greater number of firms, but with less impact since generally the inputs are multiple. Hirschman (1958) therefore does not simplify investment for the government but decreases the amount.

Industrialization and economic growth

Industrialization can refer to the increase in the share of manufacturing in the gross domestic product (GDP) and occupations of the employed population. The term can also be used to describe the development of economic activity in relatively large production units that use large numbers of machines and other fixed assets, with finely divided work tasks and formal employment relationships (Greene, K. 1981). In both cases, industrialization involves the expansion of a country's manufacturing activity, including the development of power generation and communication networks. It is also a process in which the relative importance of extractive industries declines and the relative importance of secondary and tertiary industries increases (Adejugbe 2004). Industrialization, especially manufacturing, is the most important driver of economic growth. This is because it creates jobs, generates wealth, and contributes to poverty reduction. In his address on the occasion of African Industrialization Day (2003), former Secretary-General Kofi Anan (UN) emphasized the importance of industrialization, particularly its diversity and value for poverty reduction. He argues that industrialization increases productivity creates jobs, reduces risks, improves income opportunities for the poor, and helps diversify exports. The transformation of Southeast Asia and the unprecedented pace of development of China and India within a few years are indeed ahead of their time. There is a close link between industrialization and economic growth. Although fast-growing economies tend to have a fast-growing manufacturing sector (UNIDO 2009), few countries have achieved development without industrialization. Similarly, virtually every country that has experienced rapid growth in productivity and living standards over the past two hundred years has done so through industrialization (Murphy 1989). England considered the first developed country, achieved this status through the Industrial Revolution, which enabled it to quadruple its industrial production since the 18th century through a series of cost-cutting innovations. Since then, the main criterion for growth has been the increase in per capita income, which is mainly due to industrialization. The example of Southeast Asia, to which we have already referred, is obvious. In these economies, industrialization has proven to be the natural way for an economy to grow. In these economies, industrialization has proven to be the natural way to grow an economy. Their spectacular rise stands in stark contrast to the continued industrial marginalization of sub-Saharan Africa and other least developed economies.

Empirical studies

The theoretical basis of the relationship between industrialization and growth seems to point in one direction: Industrialization promotes economic growth. Most empirical studies (Alexiou & Tsaliki, 2010; Gueçlue, 2013; Hansen & Zhang, 1996; Marconi et al., 2016; McCausland & Theodossiou, 2012; Wells &Thirlwall, 2003) aimed to test the effectiveness and validity of Kaldor's laws of development. These studies mainly used time series and panel methods to find justification for the laws. However, it is worth noting that most of these studies were conducted

in countries other than Africa. The evidence in Africa is not well supported, especially for a sample that covers recent years. The fact that most previous studies have not explicitly discussed the possible endogeneity bias between manufacturing/industry and economic development, nor have they used appropriate estimates, is a major shortcoming (Alexiou & Tsaliki, 2010; Hansen & Zhang, 1996; McCausland & Theodossiou, 2012; Wells & Thirlwall, 2003).We circumvent this limitation as Marconi & al. This paper does not follow the same trend as previous research but set out to investigate the effect of industrialization on economic growth directly using Kaldor's laws of growth. In theory, the effect of industrialization on economic growth has always followed Kaldor's growth rules (Kaldor, 1966, 1967). Kaldor's growth laws state that there is a positive relationship between manufacturing and economic growth. The manufacturing sector is regarded as the economy's "engine of prosperity," or the primary driver of economic growth. One of the underlying reasons for his argument is that there is excess labor in non-manufacturing sectors, and labor productivity in the manufacturing sector is higher than in other industries. Another explanation for the hypothesis is his claim that increases in manufacturing demand and output do not hurt non-manufacturing sector production. Kaldor's point is based on the assumption that competitive economies of scale control the manufacturing sector. Unlike traditional neoclassical growth theories, which focus on the supply side of the economy, Kaldor's growth theory focuses on the demand side. As a result, he states that technological innovation and, more significantly, increased productivity is the result of increased demand for manufactured products, which leads to increased investment (Kaldor, 1975). Hansen and Zhang (1996) test Kaldors' engine of growth hypothesis using data from 28 Chinese regions from 1985 to 1991 and find support for it. Alexiou & Tsaliki (2010) also find proof using the fixed and random effect approaches in a study of five Mediterranean countries from 1975 to 2006. Zhao and Tang (2017) equate the origins of China's economic development to those of Russia between 1995 and 2008. They discovered that the manufacturing sector, to a large extent, and the service sector, to a lesser extent, contributed to China's economic growth over time. In Russia, however, growth was mostly led by the service sector, which was followed by the primary sector. Wells & Thirlwall (2003) tested Kaldor's three laws on 45 African countries (including Cameroon) between 1980 and 1996 using data from the African Development Bank and the World Bank. Their results show that a 1% change in manufacturing value-added leads to GDP growth of 0.472% and that the same change increases manufacturing labor productivity by 0.878 percentage points and manufacturing employment by 0.878 percentage points. 0.122 percentage points. Likewise, Marconi et al. (2016) found contrasting results when testing Kaldor's first two laws on a sample of 63 middle-income and high-income countries between 1990 and 2011, and found that growth in manufacturing output is important for stimulating the growing economy and productivity. The same result is confirmed by Haraguchi et al. (2017) who showed the key role of industrialization in the rapid and sustainable growth of developing countries over the past 25 years. The authors have shown that the decrease in the share of manufacturing value-added and manufacturing employment comes from the concentration of manufacturing activities in a relatively limited number of developing countries and that industrialization can allow a low increase to occur to catch up on their economic backwardness to integrate advanced industrialization phases. Kaldor, N. (1966 and 1967), drawing on the ideas of Young (1928) cited by Dong Guo (2007), relating to the overall macroeconomic effects of the expansion of the manufacturing industry, and carrying out the econometric analysis in the dynamic instantaneous section of 12 OECD countries using the variables: economic growth rate, productivity growth rate, and employment growth rate in the 1950s and early 1960s, given providing recommendations to promote the growth of the industrial sector in the UK economy has developed three main theories known as "The Laws of Kaldor or Kaldor's Law". Indeed, its third law, provides that the growth of manufacturing output leads to the growth of the overall

productivity of the economy. This is observed by the positive relationship between the growth rate of labor productivity of all productive sectors and the growth rate of manufacturing output. This law finds that the relationship between the growth of labor productivity in the economy, in general, and the rate of employment growth in the non-manufacturing sector will be negative, since the return to labor. Despite the abundant literature, the role of industrialization on economic growth in Cameroon is hardly discussed. One of the main reasons is the lack of data. This paper used annual data published by the National Agency for Statistics and Demography of Cameroon and the World Bank and estimated Cameroon's capital stock and labor force for the period 1986 to 2020. To my knowledge, this is the first paper that uses annual data to qualify the role of industrialization in Cameroon's economic growth.

Methodology

The previous section included the introductory questions which allowed us to situate the subject and a review of the literature exploring the most prominent economic theories in this field. The most important objective of this study is to examine the impact of industrialization on economic growth in Cameroon, to know the nature of the share of the manufacturing industry in the GDP, and the impact of the capital stock and labor force on economic growth in Cameroon, this section, through the methodology presented in the previous section, will empirically deal with the subject by using time series and annual data for 35 years.

Model Specification

According to the new classic theory, we first have the production function as the function of capital K, unskilled labor H, and skilled labor L.

$Y_t = A_t K_t^{\alpha} (H_t L_t)^{1-\alpha}$ ……(1)

According to Kaldor's theory, there is a positive relationship between industrial output and GDP growth. This equation below presented the first law of Kaldor.

$q_i = \beta_i + b_i m_i$ ……(2) Where q and m refer respectively to the growth of total output and manufacturing output. The subscript g indicates the growth over the period or study period. Let q be represented by GDP and m by IND.

$Y_t = A_t K_t^{\propto} Indus^{\beta} (H_t L_t)^{\lambda}$ ……(3)

To avoid some statistical problems such as heteroskedasticity, we use the logarithm form of the empirical model as follows:

$lnY_t = lnA_t + lnK_t^{\alpha} + lnIndust^{\beta} + \ln (H_t L_t)^{\lambda}$ ……(4)

$lnY_t = lnA_t + \alpha lnK_t + \beta lnIndust_t + \lambda lnH_t + \lambda lnL_t$ ……(5)

$lnY_t = \eta + \alpha lnK_t + \beta lnIndut_t + \lambda lnH_t + \gamma lnL_t + \mu_t$ ……(6)

The translated econometric model from the above simple production function is as follows:

$\boldsymbol{Y = f\,(Sh, SC, LF)}$.

Where:

$\boldsymbol{GDP}$: Gross Domestic Product

$\boldsymbol{Sh}$: Share of Manufacturing in GDP

$\boldsymbol{SC}$: Stock of Capital

$\boldsymbol{LF}$: Total Labor Force

$$GDP_t = \beta_0 + \beta_1 Sh_t + \beta_2 SC_t + \beta_3 LF_t + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

To avoid some statistical problems such as heteroskedasticity and the management of large value the logarithm form of the empirical model is stated as follow:

$$lnGDP_t = \beta_0 + \beta_1 lnSh_t + \beta_2 lnSC_t + \beta_3 lnLF_t + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (8)$$

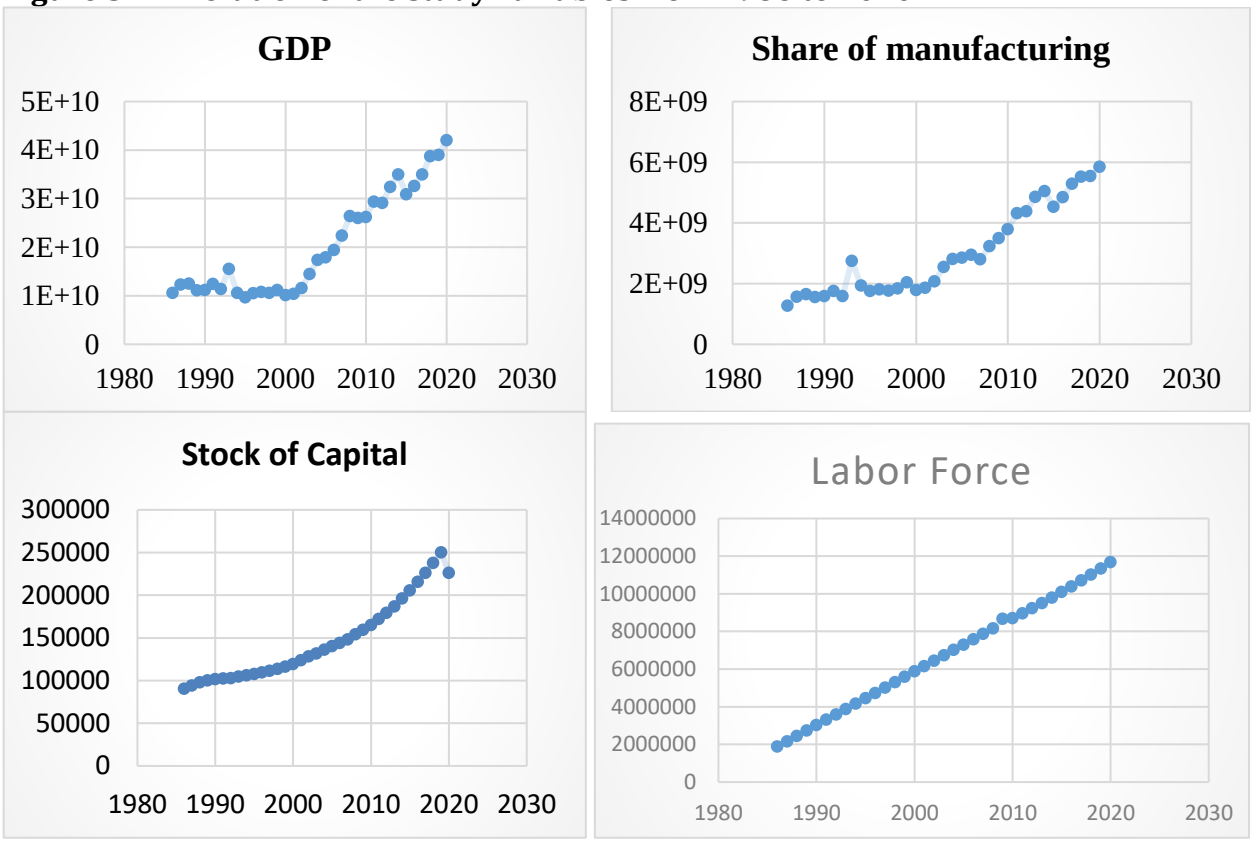
Where $\beta_0$is the constant term of the model: $\beta_1, \beta_2, \beta_3$, are the coefficients of the model and μ_t is the error term that captures the other entire variables that affect economic growth.

Data sources

Our study proposes to study the impact of industrialization on economic growth in Cameroon. To do this, we first collected on the website of the National Agency for Statistics and Demography of Cameroon data on the Stock of Capital and the Manufacturing Share in the GDP. And the following data on GDP and Labor Force on the World Bank website (World Development Indicators WDI 2020). Our dataset spans 35 years, a period from 1986 to 2020.

Graphical analysis Graph

Figure 3.1: Evolution of the study variables from 1986 to 2020



Source: World Bank (World Development Indicators WDI 2020)

Table 3.1: Expected Sign

Independent Variables	Denote	Expected Sign
Share of Manufacturing in GDP	Sh	+
Stock of Capital	SC	+
Labor Force	LF	+
Error Term	μ	

Diagnostic test

This paper employed annual time-series data, for the estimation of the model. The regression will be run by utilizing econometrics time series techniques on Stata.

Unit Root Test

Table 3.2: Unit Root Test statistical summary (Dickey-Fuller Generalized Least Squares)

Variables	DF- GLS test	
	Level	First difference
loggdp	-1.455	-3.686***
logsh	-1.997	-3.646***
logsc	-1.583	-2.095*
loglf	-1.778	-2.589**

Source: Author's calculation from the data

*** Significance level at 1%, ** Significance level at 5%, *Significance level at 10%
The result shows that all the variables contain a unit root. After the difference, all of them were integrated in first order I (1). Now all the variables are stationary. Automatically rules out the use of the error correction model (ECM). In another way to avoid spurious regression, the co-integration test of the variables was carried out.

Co-integration test

Table 3.3: Johansen Co-integration test (Sample: 1986-2020)

rank	Deterministic	Lag	T-Statistic	5%CriticalValue
0	Trend(trend)	1	66.7957	54.64
1	Trend(trend)	1	33.8225*	34.55
2	Trend(trend)	1	16.0662	18.17
3	Trend(trend)	1	3.6647	3.74
4	Trend(trend)	1		

Source: Author's calculation from the data

The result of the table above shows that there is a long-term relationship between the variables such that the independent variables (share of the manufacturing industry in GDP, capital stock, and labor) have a significant impact on the country's economic growth. This means that the dependent variable is explained by the explanatory variables, and implies that the equation fits the vector error correction model (VECM).

Table 3.4: Vector autoregressive models (var)

Selection-order criteria Sample: 1990 - 2020 Number of obs = 31

lag	LL	LR	df	P	FPE	AIC	HQIC	SBIC
0	95.0274	3.3e-08				-5.87273	-5.81242	-5.6877
1	260.579	331.1	16	0.000	**2.2e-12***	-15.5212	-**15.2196***	**-14.5961***
2	270.497	19.835	16	0.228	3.4e-12	-15.1288	-14.586	-13.4635
3	294.874	48.755	16	0.000	2.3e-12	-15.6693*	-14.8852	-13.2639
4	309.137	28.527*	16	0.027	3.5e-12	-15.5573	-14.5319	-12.4117

Source: Author's calculation from the data

Considering the results of this table 4.4 above, we can see that with a maximum number of shifts by default of four, the likelihood ratio tests selected a model with two shifts. FPE, HQIC, and SBIC also chose a model with one lag, while AIC selected a model with three offsets and LF a model with a fourth offset. Hence the maximum offset level is lag level (1)

Table 3.5: Vector Error Correction Model (short and long-run estimates)

Variables	VECM	Variable	VECM
	Long-run estimates		Short-run estimates
		ec	0.0020889
			(0.09)
logsh	3.482381	dlogsh	0.0100579
	(6.97)***		(0.35)
logsc	3.636682	dlogsc	-0.0118011
	(4.51)***		(-1.08)
loglf	-6.252034	Dloglf	0.0152078
	(-7.12)***		(5.23)***
Observation	34		34

Source: Author's calculation from the data

Notes: The dependent variable is loggdp. Significance at the 1%, 5%, and 10% are indicated by ***, **, * respectively. Standard errors in parentheses.
The above results show that all our explanatory variables are statistically significant and have a long-term relationship with the explained variable (GDP). On the other hand, only the labor force variable maintains a significant short-term relationship with GDP. The other variables

(share of the manufacturing industry in GDP, capital stock) are not statistically significant and have no short-term relationship with GDP

Autocorrelation

Table 3.6: Lagrange-multiplier test

Lag	Chi2	Df	Prob>chi2
1	**14.9308**	**16**	**0.52972**
2	**18.7520**	**16**	**0.28173**

Source: Author's calculation from the data. HO: no autocorrelation at lag order

The Lagrange-multiplier test is used to test for autocorrelation or whether the residuals are serially correlated to each other. According to the results table below, Prob>5% therefore we cannot reject hypothesis zero (Ho), which implies that there is no serial correlation problem in the model.

Specification and stability

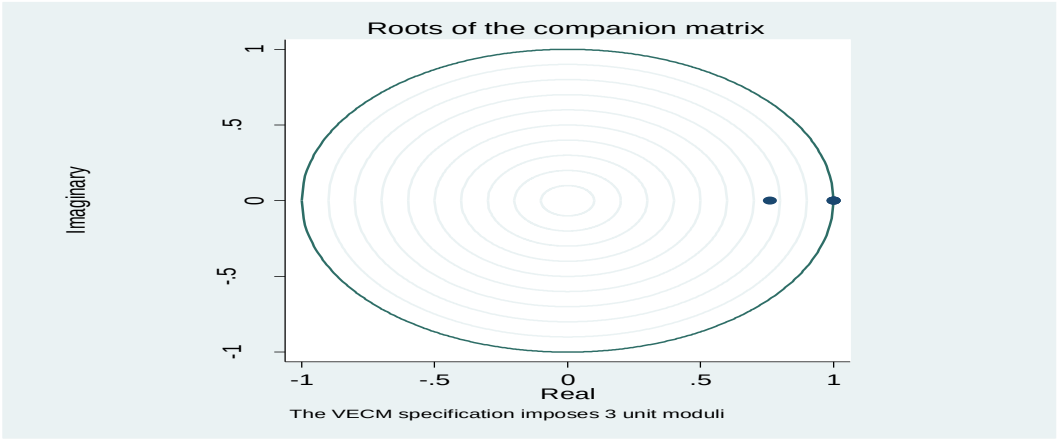
Table 3.7: Eigenvalue stability condition

Eigenvalue	Modulus
1	1
1	1
1	1
0.7597845	0.759784

The VECM specification imposes 3 unit moduli

From the table above, we can see that the modulus of the remaining eigenvalues is strictly less than one. And as we specified the graphics option in the figure below, vecstable plotted the eigenvalues of the associated matrix. The graph of eigenvalues shows that one of the remaining eigenvalues appears next to the unit circle. The stability check, therefore, indicates that our model is well specified and stable.

Figure: 3.2: Stabilization test



Source: Author's calculation from the data

Results discussion

Share of Manufacturing in GDP (Sh): the results describe that a 1% change in the Share of Manufacturing in GDP will guide GDP towards an increase of 3.48%, all other things being equal. However, it is statistically significant at the 5% level of 6.97%. Essentially, this means that when the Cameroonian government increases the share of manufacturing in the gross domestic product, economic growth improves, which simply shows that there is a positive link between the manufacturing share in noise domestic product and economic growth. This is confirmed by the second law of economist Kaldor which says: There is a strong and positive

relationship between the rate of growth of manufacturing productivity and the rate of growth of manufacturing value-added.

Capital Stock (SC): here a 1% change in SC will result in an increase in GDP of 3.63 % all other things being equal and it is statistically significant at the 5% level of 4.51% and has a positive sign indicating that the capital stock has a positive impact on economic growth. This means that savings are available at a lower interest rate. This positive relationship with economic growth is also in line with expectations.

The labor force coefficient (FL) is however statistically significant at the 5% level and depicts a negative influence on GDP. The results indicate that a point change in LF will cause GDP to drop by 6.25 % ceteris paribus. This strongly indicates that LF hurts the economic growth of the country. Although the variable is significant, the negative relationship indicates the presence of serious structural problems in the labor market that have an impact on labor productivity and employment. In the case of Cameroon, there is a mismatch between the specialized skills needed in the labor markets and those produced by the education system, thus leading to structural unemployment in the economy. This negative result could be found in the endogenous growth theory, which holds that only the quality of the workforce has a positive effect on growth. What would come up claimed that the workforce in Cameroon is not sufficiently skilled.

Conclusion and policy recommendation

The study analyzed the impact of industrialization on economic growth in Cameroon by engaging production, the first law equation of the Kaldor formula, and the regression model using different procedures of econometric techniques, in terms of using annual time series data, for 35 years. Ranging from (1986 to 2020). By study, we obtain the conclusions and recommendations below. Initially, this study was carried out using the dataset collected from the World Bank (World Development Indicators WDI 2020) and the National Agency for Statistics and Demography of Cameroon (CNSD) during the period 1986 to 2020. We tested the validity of the link between economic growth and the share of the manufacturing industry using the combined production function model of Cobb Douglas and the Kaldor model and the results prove that it is positive and significant so that a 1% increase in the variable of the manufacturer's share in the Gross Domestic Product induces a 1.003% increase in the Cameroonian gross domestic product during the period 1986-2020. Then, we used linear regression to check the validity of the link between the stock of capital and the gross domestic product, as well as that which prevails between the labor force and the gross domestic product. The results obtained confirm the existence of a positive and significant relationship between capital stock and GDP. On the other hand, for Labor, the result obtained does not correspond to what we had hoped for. Although significant, the relationship between these two variables is negative. Finally, we obtained results that are consistent with previous studies that have incorporated data from Cameroon (along with other countries) in their analysis. However, the interpretation of the results remains limited by the time chosen as well as by the availability of the data and is subject to caution. Despite the declining contributions of manufacturing over the years due to significant industrialization problems and government neglect, the results of this study have shown that industrialization has a positive impact on GDP, which is contrary to the opinion of other empirical literature in the study. It is therefore recommended that key industries (e.g., textiles, oil, aluminum, and steel) that have been neglected for a long time in Cameroon be revitalized and policies that can stimulate industrial production by improving the overall productivity of all sectors and ensuring sustainable development be implemented.

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