

THE LINK BETWEEN ENTREPRENEURSHIP AND ECONOMIC GROWTH: CASE OF ECONOMIC AND MONETARY COMMUNITY OF CENTRAL AFRICA COUNTRIES

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ABSTRACT

The purpose of this article is to analyze the link between entrepreneurship and economic growth in Economic and Monetary Community of Central Africa countries (Congo, Cameroon, Equatorial Guinea and Central African Republic) from 2008 to 2017. This analysis is done in the non-oil sector. Using the generalized method of moments in system on panel data, the econometric results show that entrepreneurship has a positive and non-significant impact on non-oil economic growth in Economic and Monetary Community of Central Africa countries. These results reflect the development of survival entrepreneurship, taking into account the nature of the businesses created. On the other hand, the control variables such as the non-oil private investment rate, the cost of procedures and the time required to start a business significantly stimulate non-oil economic growth at the 1% threshold. Other control variables such as the public investment rate and the employment-population ratio slow down non-oil economic growth significantly, respectively, at the 1% and 10% thresholds. Finally, the econometric results show that final household consumption and public spending on education have an insignificant impact on non-oil economic growth. This suggests a series of policy recommendations regarding the promotion of entrepreneurship.

Keyword: Entrepreneurship, economic growth.

1. INTRODUCTION

In the vision of African decision-makers, public enterprises were reputed to create jobs and added value. It was therefore normal that they bet on the latter to promote the growth of their countries. Unfortunately, over the years state-owned enterprises have proven to be a poor instrument for ensuring growth and development. The latter have accumulated enormous deficits which have threatened their survival. This is why, from the 1930s, the structural adjustment programs set up by the International Monetary Fund (IMF) and the World Bank attacked to public enterprises by advocating State withdrawal in the form of privatization of public enterprises. Privatization was seen by the IMF and the World Bank as a way to stimulate entrepreneurship in African countries and also to ensure a market economy alone capable of guaranteeing sustainable growth for African countries. It is also a means of establishing a market economy. It must be recognized that in many African countries, the privatization policy has nevertheless contributed to reviving economic growth. Unfortunately, in many other countries, it very quickly ran into a pitfall: the difficulty of finding local entrepreneurs capable of buying privatized companies. Thus, the debate on the link

between entrepreneurship and economic growth has regained renewed interest. Indeed, for some authors, only the activity of entrepreneurs is capable of sustaining economic growth (Carree, Van Stel, Thurik and Wennekers, 2002; Acs, Audretsch, Braunerhjelm and Carlsson, 2008; Schumpeter, 2012). For others, the results obtained on the relationship between entrepreneurship and economic growth are controversial (Van Stel and Storey, 2004; Van Stel et al., 2005; Salgado-Banda, 2007; Adusei, 2016; Maja Ivanović-Đukić and al. ., 2022). According to the African Development Report 2011, entrepreneurship has so far not played a fundamental role in growth in Africa.

Examination of certain characteristics of companies created in the Economic and Monetary Community of Central Africa countries shows a predominance of sole proprietorships compared to other legal forms. For example, out of 11,105 economic units identified in 2017 in Congo, it is established that there are 95.2% of individual companies and 94% of companies operating in the tertiary sector¹. Similarly, the Second General Business Census in Cameroon reveals that the sole proprietorship remains the legal form most sought after by business creators. Out of 209,482 companies listed in 2016, 97% of sole proprietorships are established in Cameroon.

In view of the data from the Economic and Monetary Community of Central Africa countries on business creation, there is an interest in questioning the link that exists between entrepreneurship and economic growth.

In view of the above, we asked ourselves the following question: What is the effect of entrepreneurship on economic growth in Economic and Monetary Community of Central Africa countries ?

As part of this question, we formulate the following hypothesis: the link between entrepreneurship and economic growth is positive and negligible in Economic and Monetary Community of Central Africa countries.

This research aims to analyze the link between entrepreneurship and economic growth in Economic and Monetary Community of Central Africa countries.

The remainder of this article is organized as follows: The first section presents a review of the most significant works on the relationship between entrepreneurship and economic growth. The second section shows the research methodology and the variables that will serve as elements of analysis. The third section presents the empirical results and their interpretation.

2. LITERATURE REVIEW

¹ Ministry of SMEs, Handicrafts and the Informal Sector (2017), census of very small, small, medium-sized enterprises and craftsmen in Congo.

The studies are both theoretical and empirical. From the theoretical historical point of view, the oldest and best known is that of Schumpeter (1912). The latter admits that entrepreneurship and economic growth are intimately linked and have a favorable relationship. For this author, innovations are at the origin of economic growth, they break the pre-existing situation of balance and create imbalance and instability in the economy.

Following Schumpeter, neo-Schumpeterians modeled the process of creative destruction by emphasizing how knowledge affects the level of investment in innovation (Scherer, 1992). For these authors, innovation results from investment decisions, in particular R&D, the investment of qualifications, investment in organizations by entrepreneurs who themselves respond to positive or negative incentives resulting from public political institutions. Thus, a country that experiences hyperinflation or insufficient property rights protection will discourage innovation (Aghion, 2017; Aghion and Antonin, 2017). Moreover, the hypothesis that entrepreneurship is positively related to growth and therefore to development is a hypothesis confirmed by the work of neoclassical growth (Baumol, 1968, P. 6566).

Wennekers and Thurik (1999) made a significant contribution to the study of entrepreneurship by synthesising these disparate strands of the literature to construct an operational framework linking entrepreneurship and economic growth. They highlight the multiple roles of the entrepreneur beyond that of the innovator. They also show the general innovative role of entrepreneurs that includes not only newness (implementing inventions), but also new entry (start-ups and entry into new markets). In their final framework for linking entrepreneurship to economic growth, Wennekers and Thurik clearly show the myriad effects and conditions taking place at different levels for entrepreneurial activities to have ultimate impact on economic growth. The direction of the impact is not a foregone conclusion in this framework.

Carree and Thurik (2003) provide extensive surveys of the diverse literature on the relationship between entrepreneurship and economic growth. In essence, the literature suggests that entrepreneurship contributes to economic performance by introducing innovations, creating change, creating competition and enhancing rivalry.

Many empirical studies have been devoted to the link between entrepreneurship and economic growth in developed and developing countries. It should be noted that the study of this link is complex and the results obtained in these different works are often controversial.

Holtz-Eakin and Kao (2003) analyzed the relationship between entrepreneurship and economic growth in a panel of 50 states in the United States from 1990 to 1997. Using the generalized method of moments, these authors showed that entrepreneurship measured by the entry rate (birth rate) and exit rate (death rate) of firms positively affects economic growth measured in terms of productivity. Furthermore, the data reveal that the increase in the rate of business creation causes, after a certain lag, higher levels of productivity, a relationship reminiscent of Schumpeterian creative destruction.

Salgado-Banda (2007) analyzed the link between entrepreneurship and economic growth in 22 OECD countries from 1980 to 1995. In his study, he used two different measures of entrepreneurship. Using the generalized method of moments (GMM), he obtained divergent results in these 22 OECD countries. First, by considering the variable based on patent data as a proxy for productive entrepreneurship, he found a positive relationship between productive entrepreneurship (the degree of innovation in different countries) and economic growth. Secondly, entrepreneurship is measured by an indicator based on self-employment data. The result obtained reveals that entrepreneurship seems to be negatively correlated with economic growth. For this author, this result can be explained by the fact that these business creations can be unproductive because they are geared towards the search for rent or non-innovative activities.

Maradana et al. (2017) examined the long-term relationship between innovation and economic growth in 19 European countries over the period 1989-2014. In this study, these authors used six different innovation indicators (resident patents, non-resident patents, research and development expenditures, researchers in research and development activities, high technology exports and articles in scientific and technical journals) to examine this long-term relationship with economic growth per capita. Using the error correction model and the cointegration technique, the study showed that there is a long-term relationship between innovation and economic growth per capita in most cases, generally with reference to the use of a particular innovation indicator. Thanks to the Granger causality test, the result reveals the presence of unidirectional and bidirectional causality between innovation and economic growth per capita.

Wong et al. (2005) analyzed the relationship between entrepreneurship and economic growth using cross-sectional data on 37 countries participating in the Global Entrepreneurship Monitor (GEM) 2002. From the Cobb-Douglas production function, they explored the creation of and technological innovation as distinct determinants of growth. One area of interest is the contrast between different types of entrepreneurial activity as measured using total entrepreneurial activity (TEA) rates (high growth potential TEA, necessity TEA, opportunity TEA and global TEA). Of the four types of entrepreneurship, they found that only high-growth entrepreneurship has a significant impact on economic growth.

Doran et al. (2018) analyzed the role of entrepreneurship in stimulating economic growth in developed and developing countries on an unbalanced panel of 55 countries over the period 2004-2011. They also examined whether the importance of entrepreneurship varies between high-income and middle/low-income countries. In their study, they used 14 different indicators of entrepreneurship and condensed them into three components using principal component analysis. Regression analysis is then used to assess whether these three different components of entrepreneurship drive economic growth. From the model to random effects, the results of the analysis suggest that the impact of these different types of entrepreneurship indicators on GDP is not uniform. For example, entrepreneurial attitudes (perceptions, intentions, and patterns) have positive effects on GDP in high-income countries while necessity-based entrepreneurial activity has a negative effect on economic growth in middle-income countries /weak.

Vazquez-Rozas et al. (2010) analyzed the link between entrepreneurship and economic growth in Spanish and Portuguese regions between 2000 and 2008. To measure entrepreneurial activity, they used the ratio of the number of businesses created to the total of businesses existing each year in each region. Using the fixed-effects model on panel data, they found a positive effect of the entrepreneurship variable on GDP growth.

2. METHODOLOGY

We will first present the theoretical model before examining the empirical model which will make it possible to make estimates.

2.1. Theoretical model

In this work, we will retain dynamic models to assess the effects of entrepreneurship on economic growth in Economic and Monetary Community of Central Africa countries. Because, a dynamic model is a model in which one or more lags of the dependent variable appear as explanatory variables. In this study, we will use the generalized method of moments because it provides solutions to the problems of simultaneity bias, reverse causality and possible omitted variables (generally applied in economic growth models) and is based on the orthogonality conditions between the lagged variables and the error term. Moreover, it controls the specific individual and temporal effects.

First, in the study of the relationship between entrepreneurship and economic growth, there is a bidirectional causality. This means that entrepreneurship explains economic growth and the latter can in turn act on entrepreneurship. In this case, there is an inverse causality between these two variables. Then, according to Nickell (1981) and Judson and Owen (1999), the presence of individual heterogeneity in panel data models with lagged dependent variables would tend to generate biased and inconsistent estimates if the time dimension of the panel is fixed, and small. In addition, the Generalized Method of Moments (GMM) provides a robust estimator which does not require information on the exact distribution of disturbances; therefore, GMM estimates will be robust to heteroscedasticity. Finally, Holtz-Eakin and Kao (2003) and Salgado Banda (2007) used the generalized method of moments (GMG) to assess the effects of entrepreneurship on economic growth, respectively, on a panel of 50 states in the United States from 1990 to 1997 and on 22 OECD countries from 1980 to 1995.

Thus, GMM is the most appropriate estimator in the case of dynamic models. In general, the equation of the GMM estimator looks like this:

$$y_{it} = \alpha + \beta' y_{it-1} + X_{it}\delta + \lambda_t + \mu_{it} \quad (1)$$

$i = 1, \dots, N$; $t = 1, \dots, T$; where y is the growth rate of GDP; i is a country, t is a time period /year; α is a parameter, β' is a scalar, X represents the set of explanatory variables $1 \times k$ and δ and $k \times 1$, λ_t is the time-specific effect; $\mu_{it} = u_i + u_t$ where u_i is the unobservable country-specific effect and u_t is the corresponding error term.

There are two variants of dynamic panel GMM estimators: the first-difference GMM estimator and the system GMM estimator. The GMM estimator in first differences of Arellano and Bond

(1991) consists in taking for each period the first difference of the equation to be estimated in order to eliminate the individual specific effects. We obtain :

$$\Delta y_{i,t} = \beta \Delta y_{i,t-1} + \varphi \Delta X_{i,t} + \Delta \varepsilon_{i,t} \quad (2)$$

It is then a question of instrumenting the endogenous variable delayed by its past values of two periods and more. However, this method does not identify the effect of time-invariant factors.

On the other hand, the system GMM estimator of Blundel and Bond (1998) combines first difference equations with level equations. Instruments in the first difference equation are expressed in level and vice versa.

$$\begin{aligned} \Delta y_{i,t} &= \beta \Delta y_{i,t-1} + \varphi \Delta X_{i,t-1} + \Delta v + \Delta \varepsilon_{i,t} \\ y_{it} &= \beta y_{i,t-1} + \varphi X_{i,t-1} + v + \varepsilon_{i,t} \end{aligned} \quad (3)$$

Blundel and Bond (1998) compared the results of two estimators and concluded that the MMG estimator in system is more efficient than that in first difference. Indeed, the first-difference GMM estimator seeks to eliminate country-specific effects and estimates the first-difference by instrumenting the explanatory variables of the first-difference equation by their level value lagged by one period or more, which makes for weak instruments and considerable biases in finite samples. While the system GMM estimator succeeds in overcoming this limit: it combines the first difference equations with the level equations in which the variables are instrumented by their first differences.

The efficiency of the GMM estimator relies on the assumptions that there is no second-order autocorrelation in the errors of the first difference equation and that the instruments are validated. To verify the hypothesis of non-correlation of the error terms, these authors suggest a second-order autocorrelation test, because by construction, the first-difference error term is correlated to the first order, but it must not be second-order.

To test the validity of instruments used in panel data regressions, Arellano and Bond (1991), Arellano and Bover (1995), Blundell and Bond (1998) suggest the Sargan over-identification test. For a level of significance, the body of hypotheses to be tested is as follows:

- $H_0 : E \left[z'_{it} (y_{it} - x_{it} \bar{\beta}) \right] = 0$ The instruments are validated.
- $H_1 : E \left[z'_{it} (y_{it} - x_{it} \hat{\beta}) \right] \neq 0$ The instruments are not validated.

2.2. Empirical model

We will empirically test the relationship between entrepreneurship and economic growth in CEMAC countries (Congo, Cameroon, Equatorial Guinea and Central African Republic). The period chosen in this thesis goes from 2008 to 2017. The choice of this period is justified by the fact that Congo, Cameroon, Equatorial Guinea and CAR continue to suffer the effects of the crisis of low commodity prices (mainly oil), but also security crises. Moreover, it should be noted that

the efforts made by the governments of these countries to create a better business climate capable of attracting foreign direct investment are still insufficient. One may wonder if the efforts already made by these governments have stimulated non-oil economic growth and consequently the reduction of unemployment and poverty in this area.

In order to increase the number of observations, we proceeded to the quarterly data. Thus, the quarterly distribution of data made it possible to obtain 160 observations instead of 40. In addition, it should be noted that only the non-oil sector is included in our analyses.

2.2.1. Specification of the empirical model

To identify the impact of entrepreneurship on economic growth, the model to be estimated in the form of a linear combination between the variables can take the following form:

$$\text{RGRNOGDP} = \alpha_i + \beta_0 \text{RGRNOGDP}_{it-1} + \beta_1 \text{EAR}_{it} + \beta_2 \text{NOPIR}_{it} + \beta_3 \text{PIR}_{it} + \beta_4 \text{EPR}_{it} + \beta_5 \text{PEE}_{it} + \beta_6 \text{FHC}_{it} + \beta_7 \text{CPSB}_{it} + \beta_8 \text{TNSB}_{it} + \varepsilon_{i,t}$$

2.2.2. Presentation of variables and data sources

This involves presenting the variables retained in the empirical model and the sources of the data.

2.2.2.1. Presentation of variables

Two types of variables are used in this empirical model. These are the dependent variable and the independent variables.

Regarding the dependent variable, we have the real growth rate of non-oil gross domestic product (RGRNOGDP). This variable explains the evolution of RGRNOGDP. The choice of this variable is made to rule out any direct impact of the oil sector on the non-oil sector. Indeed, this thesis aims to analyze the effects of entrepreneurship on non-oil economic growth. Thus, the RGRNOGDP variable is explained by the independent variables retained in this study.

Regarding the independent variables, we have the Entrepreneurial Activity Rate (EAR), the Non-Oil Private Investment Rate (NOPIR), the Public Investment Rate (PIR), the Final Household Consumption (FHC), the Ratio Employment-Population (EPR), Public Expenditure on Education (PEE), Time Necessary to Start a Business (TNSB) and Cost of Procedures to Start a Business (CPSB).

The Entrepreneurial Activity Rate (EAR) is a proxy that captures the level of entrepreneurial activity. This Entrepreneurial Activity rate was calculated using the ecological approach. It is obtained from the ratio between the number of new businesses created and the total number of existing businesses. It should be noted that apart from the measure used by the ecological approach, other measures have been used by researchers to capture the rate of entrepreneurial activity. These are the measure used by the labor market approach, the index of total entrepreneurial activity (TEA) used by the GEM, the rate of entry and exit of businesses or self-employed workers, measures based on innovation, measures based on entrepreneurial intentions and measures based on organizational performance, for example (Iversen and al., 2005).

We find that there is no consensus among researchers in the method used to measure entrepreneurial activity. Also, in the evaluation of the effects of entrepreneurial activity on economic growth, the results obtained differ according to the different measures used. For example, using the rate of new own-account workers as a measure, the United States was found last out of 28 relatively industrialized countries in 2002, while Turkey and Greece ranked first (Blanchflower, 2004). On the other hand, using the number of new entrepreneurs, the United States drops to fifth place and Greece falls to 18th (Turkey not being part of the analysis in this case). In terms of the most innovative new firms, Japan ranks first, while the United States ranks fifth and Greece seventeenth (Salgado-Banda, 2007). Each measure has its advantages, but none reflects the multidimensional and heterogeneous nature of entrepreneurship and, above all, the different types of entrepreneurship. In principle, the ideal measure of entrepreneurship should include each of these different ways of doing things, but it is very difficult to achieve, as one might suspect (Audretsch, 2002; Iversen et al., 2005). The fact remains that the most commonly used measure is what is called “business demography”, i.e. the creation, disappearance and evolution of the number of businesses over time or their degree of volatility. At least, this measure appears the most likely to meet the most immediate needs, especially if we want to make regional comparisons.

Non-oil private investment (measured as a percentage of non-oil GDP). A country's investment is an indicator of its economic dynamism. The higher a country's investment rate, the more the country is dynamic and strives to use its wealth created to build its future. In the economic literature, it is shown that there is a positive relationship between capital investment and economic growth. Because any investment in the capital of the company is intended to increase national production. Next, the private investment rate reflects the weight of private investment according to the size of the economy (Misati and Nyamongo, 2011; Cavallo and Daude, 2011).

Public investment (measured as a percentage of non-oil GDP) is represented by public investment expenditure. The latter generally encourage private investment when it comes to public spending on infrastructure. On the other hand, these expenditures discourage private investment when they are made in the non-infrastructure sector (Blejer and Khan, 1984).

Final household consumption (measured as a percentage of non-oil GDP), like the first two variables, is an element of aggregate demand in Keynes (1936). The latter has a positive influence on the gross domestic product.

Public spending on education (measured as a percentage of GDP) is a proxy that captures the level of human capital (Bouyad, 1994).

The employment-population ratio makes it possible to capture the labor factor. When a given threshold is reached, any increase in this labor factor used by companies, all other things being equal, causes the marginal productivity of this factor to decrease (Solow, 1956). This decrease in the marginal productivity of labor in turn leads to a decline in economic growth.

The Time Needed to Start a Business (measured in days) and the cost of procedures to start a business (measured by gross national income per capita) are indicators used by the World Bank to

measure the business climate in a country. If the business climate is good, this encourages entrepreneurs to start businesses. Thus, the creation of new businesses positively influences economic growth. On the other hand, a bad business climate does not attract foreign direct investment and even discourages local entrepreneurs from investing.

2.2.2.2. Data sources

Data to assess the link between entrepreneurial activity and economic growth have been collected from a variety of sources.

With regard to data on the Entrepreneurial Activity Rate (EAR), these were collected in the Statistical Yearbooks of the National Institute of Statistics and from One-Stop Shops (Congo, Cameroon, Equatorial Guinea and Central African Republic), Business directories and demography (Cameroon). In addition, to know the number of existing companies, we used the National Report on Human Development in Congo (2015), the First General Census of Companies in 2009 and the Second General Census of Companies in Cameroon in 2016. These numbers of companies existing in 2007 and 2012 were collected, respectively, in the Report on the Private Investment Environment in the Central African Republic, 2012 and the Report on the Environment of private investment in Equatorial Guinea, 2012. From these statistics, we calculated the EAR of each country included in this study using the ecological approach. From these statistics, we calculated the EAR of each country included in this study using the ecological approach.

Regarding the data on the real growth rate of non-oil gross domestic product (RGRNOGDP), these were collected in African Economic Outlook and from the Bank of Central African States (BEAC).

The Non-Oil Private Investment Rate (NOPIR), the Public Investment Rate (PIR) and the Final Household Consumption (FHC) were calculated by the author from data collected in the Franc Zone Annual Reports and in the World Bank database.

Employment to Population Ratio (EPR), Time Needed to Start a Business (TNSB) and Cost of Procedures to Start a Business (CPSB) were collected from the World Bank database.

Finally, data on Public Expenditure on Education (PEE) comes from statistics collected in the African Economic Outlook.

3. EMPIRICAL RESULTS AND INTERPRETATION

Before analyzing the results from the estimation of the empirical model, we will first present the results of the post-estimate tests.

3.1. Presentation of the results of the pre-estimate tests

This involves presenting the results of the descriptive statistics of the variables, the stationarity tests, the endogeneity test and the correlation matrix of the variables.

3.1.1. Results of the descriptive statistics of the variables

Table 1 presents the descriptive statistics of the variables.

Table 1: Descriptive statistics of the variables

Variables	Obs	Mean	Sted.Dev.	Min
Max				
RGR NOGDP 2.55683	160	0.5373929	1.832692	- 9.67269
EAR 7.148274	160	3.044938	1.700822	0.412566
NOPIR 67.94037	160	6.317774	10.72536	- 0.3882382
PIR 59.63315	160	9.192269	13.90853	0.27138
EPR 22.24338	160	16.73151	1.702532	11.34459
PEE 18.58174	160	1.380857	2.7711	0.13678
FHC 72.6697	160	26.8252	12.01092	10.90535
CPSB 155.8242	160	46.89115	47.47844	- 2.91633
TNSB 45.8065	160	18.32347	15.41013	1.9209

NB : The data in Table 1 are quarterly.

Source: Author from Stata software.

Table 1 gives the statistical description of the variables. It reveals heterogeneity within the sample. The dependent variable average of RGRNOGDP is 0.537% and the average of EAR stands at 3.045% over the period from 2008 to 2017. The maximum of RGRNOGDP is 2.557% while its minimum stands at -9.673%. As for the EAR, the maximum is 7.148% and the minimum is 0.413%.

There is also heterogeneity in the values of the control variables: the NOPIR (on average 6.317%) varies from -0.388% to 67.94%; the PIR (on average 9.192%) varies from 0.271% to 59.633%. Similarly, the EPR (average of 16.732%) varies from 11.345% to 22.243%, PEE (average of 1.381%) varies from 0.137% to 18.582%, FHC (an average of 26.825%) ranges from 10.905% to 72.670%, the CPSB (an average of 46,891 in value) varies from -2,916 to 155,824 and the TNSB (an average of 18,323 days) varies from 1.921 to 45, 8065.

3.1.2. Results of stationarity tests

Unit root testing in panel data has seen dramatic advances overall. Among the tests recently developed, we have the unit root tests of Levin et al (2002) and Im et al (2003).

As part of this work, we will retain two tests, namely the Levin-Lin-Chu (LLC) test and the Im-Pesaran-Shin (IPS) test. Table 2 presents the results of the stationarity tests.

Table 2: Results of stationarity tests

Variables	LLC		IPS	
	En niveau	En Différence première	En niveau	En Différence première
TCPIB	0.0567*	0.0239**	0.6564	0.0001***
TAE	0.1045	0.0011***	0.4725	0.0000***
TINVPRHP	0.0437**	0.1509	0.5259	0.0000***
TINVPU	0.0016***	0.0016***	0.7473	0.0000***
DPE	0.0004***	0.0000***	0.0000***	0.0000***
REP	0.1545	0.0035***	0.0000***	0.0000***
CFM	0.4359	0.0022***	0,6501	0.0000***
CPDE	0.9400	0.0028***	0.9999	0.0000***
TNDE	0.2613	0.0009***	0.9943	0.0000***

Source: Author from Stata software.

The results summarized in Table 2 indicate that all the variables used in this study are stationary in first difference for the LLC and IPS tests. However, the non-oil private investment rate variable is stationary in level for the LLC test.

3.1.3. Endogeneity test results

The endogeneity test is carried out using the Nakamura-Nakamura test which is done in two stages: First, each endogenous variable is regressed on the exogenous variables of the model and its instruments. Then, the residuals from the first stage are retrieved and included in the initial model. Table 3 shows the first stage and the second stage of the Nakamura-Nakamura endogeneity test.

Table 3: Nakamura-Nakamura endogeneity test

First stage:

Number of obs = 156
 F (9, 146) = 2.53
 Proba > F = 0.0101
 R-squared = 0.0925
 Root MSE = 1.8054

EAR	Coeff	Robust Std.Err	P>
t			

EAR			
L1	0.9175065	0.0297637	0.000
EPR	0.091014	0.0292538	0.002
PE E	- 0.0076978	0.0244197	0.753
NOPIR	- 0.0197381	0.007468	0.009
PIR	- 0.0014395	0.0059468	0.809
FHC	0.0169904	0.0078242	0.031
CPSB	0.0015223	0.0009152	0.098
TNSB	- 0.000294	0.0029346	0.920
Constant	- 1.674208	0.3981706	0.000

Source: Author from Stata software.

Second step:

Number of obs = 156
 F (9, 146) = 2.53
 Proba > F = 0.0101
 R-squared = 0.0925
 Root MSE = 1,8054

RGRNOGDP	Coeff	Robust	Std.Err
P> t			
EAR	0.5589458	0.3775895	0.141
Res EAR	- 0.3624683	0.3262472	0.268
EPR	0.0839081	0.0747574	0.264
PE E	- 0.0071298	0.0306967	0.817
NOPIR	- 0.0026791	0.0117709	0.820
PIR	- 0.0107581	0.0129414	0.407
FHC	- 0.0468058	0.0154713	0.003
CPSB	- 0.0031217	0.0036117	0.389
TNSB	0.0359461	0.0111832	0.002
Constant	- 0.7874864	1.275346	0.538

Source: Author from Stata software.

The results of the endogeneity test carried out using the Nakamura-Nakamura test on all the variables of our model reveal that the coefficients of the residuals of the equation of the first stage are jointly significant and correlated with economic growth. This tends to support the hypothesis of endogeneity of the variables.

3.1.4. Results of the correlation matrix of variables

Table 4 presents the correlation analysis of the variables used in the models used in this study.

Table 4: Correlation matrix of variables

	TCPIBRHP	TAE	REP	DPE	TINVPRHP	TINVPU
CFM	CPDE	TNDE				
RGRNOGDP	1.0000					
EAR	0.1110	1.0000				
EPR	0.0802	0.5848	1.0000			
PEE	0.0064	- 0.1608	- 0.1855	1.0000		
NOPIR	- 0.0641	- 0.0521	- 0.0876	0.1148	1.0000	
PIR	- 0.0531	- 0.2231	0.2905	0.2053	0.6819	1.0000
FHC	- 0.0931	- 0.1636	- 0.2290	0.1533	0.6439	0.8860
CPSB	- 0.0904	0.2921	0.2433	- 0.2816	- 0.3168	- 0.4815
1.0000						- 0.3853
TNSB	0.0750	- 0.4462	- 0.4773	0.2997	0.3349	0.6582
- 0.5928	1.0000					0.6316

Source: Author from Stata software

The correlation matrix makes it possible to verify the existence or not of a multi-collinearity problem. The results found in Table 4 show us that most of the correlation coefficients are low. However, we notice that there are high correlation coefficients for variables such as the public investment rate, the employment-population ratio, final household consumption and the time required to start a business. We can conclude that there is no multi-collinearity problem.

3.2. Analysis of the results of the estimation of the empirical model

Before interpreting the econometric results obtained, we will first present these results.

3.2.1. Presentation of empirical results

This is to present the results from the estimation of the empirical model. It should be noted that Blundel and Bond (1998) compared the results of two estimators and concluded that the system GMM estimator performs better than the first difference estimator. Table 5 shows the results estimated from the GMM in system.

Table 5: Results of the method of generalized moments in system (one step)

Variables explanatory	Endogenous variable		
	RGRNOGDP		
	<i>Coef.</i>	<i>Std.Err.</i>	<i>z</i>
	<i>Prob</i>		

RGRNOGDP	0.6788106 ***	0.0646121	10.51
(-1)	0.000		
EAR	0.0340959	0.0674649	0.51
EPR	0.613		
PEE	- 0.2192099 *	0.1156127	- 1.90
NOPIR	0.058		
PIR	- 0.026827	0.0302104	- 0.89
FHC	0.375		
CPSB	0.2204419 ***	0.0393344	5.60
TNSB	0.000		
Constant	- 0.1255968***	0.0376966	- 3.33
	0.001		
	0.0543074	0.038128	1.42
	0.154		
	0.0368243 ***	0.0097465	3.78
	0.000		
	0.0605304 ***	0.0162264	3.73
	0.000		
	- 0.7369573	1.487096	- 0.50
	0.620		
Instrument over identification test by Sargan	Chi2(2) = 35.95	Prob > chi2 = 0.248	
Autocorrelation Test			
Arellano-Bond test(AR1)	z = -	Pr > z = -	
Arellano-Bond test(AR2)	z = 0.46	Pr > z = 0.644	

*** : Significance at the 1% threshold, **: Significance at the 5% threshold, *: Significance at the 10% threshold.

Source: Author from Stata software.

Given that the GMM estimator in system is more efficient than that in first differences, in this case, it is preferable to retain in our study the results of GMMS. The relevance of the system GMM estimator relies on the validity of two tests: the Sargan/Hansen over-identification test of the validity of the instruments. To reject the null hypothesis is to reject the validity of the model. The second test examines the null hypothesis that the error term is uncorrelated over time. Again, the rejection of the null hypothesis reflects the failure of the model.

In the context of our work, Table 7 shows that the Sargan over-identification test of the validity of the instruments is 0.248. We cannot therefore reject the null hypothesis of the validity of the instruments. This reflects the correct specification of the selected model. Moreover, we notice that

there is no second-order auto-correlation of the errors of the difference equation (AR2); because, the second order autocorrelation test of Arellano and Bond does not allow to reject the hypothesis of absence of second order autocorrelation.

Subsequently, we can also do the test of normality of the residuals. Table 6 presents the results of the residual normality test.

Table 8: Residual normality test (Skewness/Kurtosis)

Variables	obs	Pr (Skewness)	Pr (Kurtosis)	adj chi2 (2)	Prob>chi2
Residues	160	0.5165	0.1045	3.10	0.2120

Source: Author from Stata software.

The results of the normality test give a probability = 0.2120 > 0.05; this does not allow us to reject the null hypothesis, namely that the residuals of the model retained after the estimation of the GMMS follow a normal law.

3.2.2. Results interpretation

There are two types of interpretation to be made: the econometric interpretation and the economic interpretation of the results.

3.2.2.1. Econometric interpretation

The results in Table 7 show that the coefficient of the lagged endogenous variable is positive and significant at the 1% level. On the other hand, the entrepreneurial activity rate and the real growth rate of non-oil gross domestic product are positively and not significantly related. We recall that the entrepreneurial activity rate is the variable of interest in this study.

Other variables contained in Table 5 are control variables. The non-oil private investment rate and the real growth rate of non-oil gross domestic product are positively and significantly related to the 1% threshold. Similarly, the cost of procedures and the time required to start a business and the real growth rate of non-oil gross domestic product are positively related to the 1% threshold. However, the public investment rate and the real growth rate of non-oil gross domestic product are negatively related to the 1% threshold and the employment-to-population ratio and the real growth rate of non-oil gross domestic product are negatively related to the 10% threshold.

On the other hand, the link between final consumption and public expenditure on education and the real growth rate of non-oil gross domestic product is not significant. It should be noted that the link between final consumption and the real growth rate of non-oil gross domestic product is positive while the link between public expenditure on education and the growth rate of real non-oil GDP is negative.

The econometric model used in this study to explain economic growth shows that the coefficient of the lagged endogenous variable is positive and significant at the 1% level; which suggests that the non-oil economic growth of any given year depends on the non-oil economic growth of the past year.

In this econometric model, the variable of interest is the rate of entrepreneurial activity and the other variables have the status of simple control variables. Indeed, the results obtained on this variable of interest show from an economic point of view that entrepreneurship (captured by the rate of entrepreneurial activity) has no effect on non-oil economic growth (measured by the rate of growth in real non-oil domestic product). Not to be excessive, one could say that entrepreneurship has only a negligible impact on the non-oil economic growth of the Economic and Monetary Community of Central Africa countries (Congo, Cameroon, Equatorial Guinea and Central African Republic). This result might seem very surprising in terms of economic theory. Indeed, according to the latter, entrepreneurship has a very significant impact on economic growth and this impact is only very little contested in the economic literature. Although going against the conclusions of the dominant theory, this result may nevertheless be understandable in developing countries. In these countries, there is a predominance of generally underperforming necessity businesses. It has been shown that the presence in greater numbers of this type of company tends to slow down economic growth rather than to stimulate it (Van Stel et al., 2005). As for Van Stel and Storey (2004), necessity entrepreneurship does not contribute to economic growth. This analysis is indeed applicable to Economic and Monetary Community of Central Africa countries and can then be used to explain the result obtained for these countries. It should be noted that the results obtained by Adusei (2016) show that entrepreneurship positively explains growth variations in 12 African countries.

3.2.2.2. Economic interpretation

The presence of a positive sign identified in the econometric relationship between entrepreneurship and non-oil economic growth can also be the subject of an economic interpretation. In this sense, the positive sign assumes that the level of entrepreneurship in the CEMAC countries is far from having reached the critical threshold that allows it to trigger the desired favorable impact on non-oil economic growth.

If entrepreneurship has no impact on economic growth, according to our econometric results, other variables play a role in stimulating non-oil economic growth. These are control variables such as the non-oil private investment rate (NOPIR), the cost of procedures to start a business (CPSB) and the time needed to start a business (TNSB).

Indeed, the private investment rate of a country is an indicator of its economic dynamism. The higher a country's investment rate, the more the country is dynamic and strives to use its created wealth to build its future. In the economic literature, it is shown that there is a positive link between capital investment and economic growth. Because any investment in the capital of the company is intended to increase national production. In the case of Economic and Monetary Community of Central Africa countries, the non-oil investment rate promotes non-oil economic growth. Its average is 6.318 per quarter (in % of non-oil GDP). Similarly, the cost of procedures and the time needed to start a business are among the indicators used by the World Bank to assess the business climate in a country. In the case of the countries included in our study, they make it possible to stimulate non-oil economic growth. A good business climate (reduction in the cost of procedures and the time required to start a business) promotes entrepreneurship and creates a positive impact on non-oil economic growth. The average of these costs of procedures is 46.891 per quarter (in %

of national income per capita) while that of the time required to start a business is 18.32 days per quarter. This shows that the efforts made by the governments of these countries to improve the business climate are still insufficient to boost non-oil economic growth. On the other hand, a bad business climate (Increase in the cost of procedures and the time required to start a business) constitutes a brake on business creation and therefore negatively affects non-oil economic growth. In this case, this hinders foreign direct investment and some entrepreneurs are forced to set up their businesses in the informal sector.

On the other hand, other control variables slow down non-oil economic growth significantly. These are variables such as the public investment rate (as a % of non-oil GDP) and the employment-population ratio.

Economic theories (Barro, 1990; Keynes, 1936) teach us that public investment is a favorable determinant of economic growth. However, the public investment rate affects the non-oil GDP growth rate negatively and significantly at the 1% threshold. This result is contrary to expectations. This result is similar to the study by Devarajan et al. (1996) in 43 developing countries. Similarly, that of Nembot Ndeffo et al. (2021) in CEMAC countries shows that in Congo and Chad, the link between public investment expenditure and economic growth is negative and significant at the 5% threshold in the long term. According to the results obtained by these authors, for investment expenditure to have a positive impact on growth, it must reach at least 20.91% and 7.49%, respectively, in the Republic of Congo and Chad. However, the respective averages of public investment expenditure in these countries are only 12.75% for the Republic of Congo and 4.42% for Chad.

Thus, we can conclude that when public investment expenditure reaches a given threshold, it can trigger a positive effect on economic growth in these countries studied. It should be recalled that the average public investment rate is 9.192 per quarter (as a percentage of non-oil GDP) in the Economic and Monetary Community of Central Africa zone. We can also say that this finding can be explained by the poor governance that exists in these Economic and Monetary Community of Central Africa countries.

Similarly, the link between the employment-to-population ratio and the growth rate of non-oil GDP has a negative and insignificant effect. Beyond a given threshold, any increase in labor, all other things being equal, causes the marginal productivity of this factor to decrease, which negatively affects the growth rate of non-oil GDP. This reveals the existence of diminishing returns in private companies operating in the Economic and Monetary Community of Central Africa zone. We know that to explain long-term economic growth, Solow's (1956) model added a technological factor (or technical progress) to "work around" what some interpret as a theoretical limit to the law of diminishing returns. For Schumpeter (1912), the introduction of innovation in these companies can improve the marginal productivity of the labor factor and increase non-oil economic growth in a sustainable way.

In the case of control variables such as final household consumption (measured as a percentage of non-oil GDP) and public expenditure on education (as a percentage of GDP), the link between

with economic growth is not significant. For the first variable, the link with economic growth is positive. This result corroborates with the Keynesian approach. Indeed, any increase in final household consumption leads to an increase in overall demand and consequently an increase in business production. The latter explains the improvement in non-oil economic growth. On the other hand, the second variable has a negative relationship with non-oil economic growth. This result contradicts the thesis defended by Mankiw et al. (1992). Because, these authors argue that public authorities can ensure positive long-term growth by deploying a policy of support for education that keeps the rate of accumulation of positive human capital. This negative and insignificant link between public expenditure on education and non-oil economic growth can be explained by the fact that the amount allocated to this expenditure is still low (1.38% of GDP) in these countries studied. Certainly, the quality and level of human capital operating in the private sector is still low for it to trigger a positive effect on non-oil economic growth. In addition, another explanation is that these expenditures are much more oriented towards general education than technical and vocational education. In addition, trained human resources are misused in wealth-creating activities. Finally, this negative link shows that the supply of educated labor is greater than the demand for educated labor; in this case, part of this workforce is not employed by the companies. Also, the high unemployment rate in these countries explains this negative link, despite the amount allocated to education by governments to improve the level of human capital.

Thus, to trigger the positive effect of public expenditure devoted to education on non-oil economic growth, the amount of this expenditure should be rationally allocated in the education system and the human resources trained should be well used or channeled into wealth-generating activities and technological progress.

4. CONCLUSION AND POLICY IMPLICATIONS

This article analyzed the link between entrepreneurship and economic growth in Economic and Monetary Community of Central Africa countries. In this macro-economic analysis, we have retained the non-oil sector. The variable of interest is the rate of entrepreneurial activity and the other variables retained in our econometric model are control variables. The results of this research provide the following lessons and policy implications.

Regarding the lessons learned in this research, the econometric results reveal that entrepreneurship exerts a positive and non-significant influence on non-oil economic growth. This result shows that the companies created are not performing well. This validates the hypotheses put forward from the outset.

Then, these results show that the non-oil private investment rate, the costs of procedures and the time required to start a business have a positive and significant impact on non-oil economic growth at the 1% threshold. On the other hand, the public investment rate and the employment-population ratio have negative and significant effects, respectively, at the 1% and 10% thresholds. Finally, final household consumption and public spending on education have an insignificant impact on non-oil economic growth.

Also, from these econometric results obtained from the generalized method of moments in system, we can draw important policy implications.

Taking into account the survival entrepreneurship that predominates in Economic and Monetary Community of Central Africa countries, it is important to include entrepreneurship courses in the curricula of primary education, secondary education and higher education. This encourages entrepreneurship among young people and awakens entrepreneurial skills from primary and secondary schools. Next, the public authorities must create an entrepreneurship stream from the second cycle of technical secondary education. In addition, technical education and vocational training will produce the technical knowledge needed to foster technological innovation in companies. For example, engineering education promotes the design and development of new products, manufacturing processes and marketing. In addition, the establishment of entrepreneurship incubators will promote opportunity entrepreneurship. Because the process of creating a business is very complex regardless of the type of project, the level of training of the entrepreneur or the aid available to him. This is why the main mission of incubators (sometimes called incubators or business nurseries) is to support business creators in their project.

As with any empirical work, this one has certain limitations that should be noted. Firstly, the collection of annual data on business mortality rates (business disappearance) in these countries included in this study was not possible to know the actual number of businesses operating in the field each year. Secondly, the absence of survey data allowing us to know the reasons that drive entrepreneurs to create businesses in these countries studied. Third, the collection of data on the exact number of patents declared each year also did not make it possible to distinguish between the number of innovative companies and the number of non-innovative companies in each country included in this study.

Thus, in future research, it would be interesting to take into account some thoughts. First, we would like a survey to be carried out to find out the reasons that drive people to create businesses. This will give an idea of the workforce of companies of necessity and companies of opportunity. Then, it is also necessary to collect statistics of innovative companies each year. This will make it possible to measure entrepreneurship based on the number of patents and to examine its link with non-oil economic growth. Finally, the tax department must publish the statistics of companies that pay taxes each year in order to know the actual workforce of companies that are in the field and that participate in the creation of wealth in these countries.

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