

Human capital and economic growth: The case of ECOWAS countries

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ABSTRACT: Human capital is the cornerstone of the development of economic and social activities. It is an accumulation of investments by an individual in order to improve his productive capacities like education. Our paper aims to present and analyze the relationship between human capital and economic growth on the African level, while approaching concretely the real image through the case of the ECOWAS countries. Our study will focus, essentially, around the concept of human capital, an analysis of the relationship between human capital and economic growth for ECOWAS countries through econometric modeling, and an interpretation of the results of the model.

KEYWORDS: Human capital, economic growth, education, skills, ECOWAS.

1 INTRODUCTION

Since the twentieth century, the gap between the wealth produced in the most developed countries and less developed countries is a subject of debate in the sphere of economists, especially, specialists in economic and social development. This issue of the development gap between nations has been largely addressed by growth theorists, while taking into account the changes experienced after the world wars.

Parallel to the economic and social development that nations are experiencing on a global scale, growth theories have been radically renewed. Indeed, there is a set of « new theories » called « theories of endogenous growth », whose main objective is to analyze the pace of development of nations.

According to (Denison, 1962), growth had been greater than would have been implied by the growth of the two economic or production factors, namely labor and capital. To explain this growth, a « residual » factor has been added to represent technical progress or « quality of work », which will be reflected in the following by the design of « human capital ».

Inspired by the theories of Adam Smith, Schultz (1961) and Becker (1964), developed the concept of « human capital ». According to this theory, an individual who has decided to follow a training course instead of working, reasons according to the perspective of an investor. As a result, education would have a direct impact on physical capital, as it is an expense to achieve future returns.

In other words; Barro, Mankiw and Sala-I-Martin (1995) observe human capital as the fundamental variable explaining the macroeconomic evolution of economic factors. They add that in a situation of perfect mobility of financial capital, human capital seen as a factor of production. In this sense, OECD countries see human capital as an appropriate solution to reduce unemployment and income inequality, and to improve productivity and economic growth.

Being the first to deal with the question of the relationship between the productive sector and the education sector, Lucas (1988) considers that the productivity of the employees is a main factor explaining the productivity of the sectors. Thus, education is seen as one of the engines of growth and development as it impacts on the economic and social development of nations.

Today, countries invest in human capital through improving the quality of training. They thus promote the social factor, in this case, welfare, in so far as the social factor plays a crucial role in productivity.

Africa on its part, and since the acquisition of independence, has not been able to make substantial progress in terms of economic growth and economic and social development. In this sense, African countries have tried to pursue regional development policies, with the aim of bringing nations together, removing barriers to the free movement of goods, services, capital and factors of production, thereby promoting regional exchanges and ultimately strengthen and encourage the development of the countries of the region. In this respect, it is necessary to say that there are more than 14 regional groupings in Africa linking several African communities in the framework of regional integrations. Among these integrations, for example, UEMOA, CEN-SAD, and ECOWAS.

Our study focuses on the study of the relationship between human capital and economic growth for the countries that constitute the Economic Community of West African States (ECOWAS).

In the first part of this article, I will try to define the relationship between human capital and economic growth. In the second part I will present an overview on the Economic Community of West African States (ECOWAS). In the third part, I will analyze the relationship between human capital and economic growth for the case of the ECOWAS countries through econometric modeling.

2 RELATIONSHIP BETWEEN HUMAN CAPITAL AND ECONOMIC GROWTH

In the first part of this article, I will try to define the relationship between human capital and economic growth. In the second part I will present an overview on the Economic Community of West African States (ECOWAS). In the third part, I will analyze the relationship between human capital and economic growth for the case of the ECOWAS countries through econometric modeling.

According to the OECD, investment in human capital works for economic prosperity, employment and social cohesion, and its crucial role in promoting individual, economic and social well-being. It is thus translated by the knowledge, skills, competencies and individual characteristics that facilitate the creation of personal well-being. Moreover, human capital has always been linked and evaluated according to acquired cognitive skills and specific knowledge. However, the concept of human capital contributes to the evolution of economic and social activities and well-being¹. On the other hand, states must have the different components of human capital.

According to the definitions of the concept of human capital provided by the OECD in the 2001 report, capital includes²:

- The capital produced, in other words, man-made means of production, such as machinery, tools and buildings, but also infrastructure that is not specifically related to the production activity, intangible assets and financial assets to influence on the current and future flow of production;
- Natural capital, in other words, natural renewable or non-renewable resources that enter the production process and serve the needs of consumption, as well as environmental assets with a function of amenity or productive use and which are essential for the survival of the species;
- Human capital, in other words, the knowledge, skills, competences and individual characteristics that facilitate the creation of personal well-being. Thus defined, human capital includes training (structured or not) and health;
- Social capital, in other words networks of norms, values and common convictions that facilitate cooperation within and between groups.

The relationship between human capital and economic growth has been widely regarded as the research problem of many economists. In this context, Pritchett (2001), through several works will question this relationship. According to him, the analysis of the results of the studies shows a lack of relationship between human capital and growth or even a negative relationship.

¹ OCDE (1996b), Op,Cit , p7

² OCDE(2001), Sustainable development, les grandes questions p 39

In parallel with Pritchett's work, education economists will add to the studies carried out the role of education. Indeed, education plays a crucial role in economic development. To this end, the quality of education systems must imperatively be included in the analysis of the relationship between human capital and economic growth. On the basis of this observation, the quality indicators of education will help to find the positive effect of human capital in its relationship with well-being.

3 OVERVIEW OF ECOWAS

The Economic Community of West African States (ECOWAS) has been established according to well-defined principles and objectives while relying on specific governance bodies. Created by the Treaty of Lagos of May 28, 1975, composed of 15 countries: Benin, Burkina Faso, Cape Verde, Ivory Coast, Gambia, Ghana, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. The main objective of this community is to promote cooperation and integration in the perspective of a West African Economic Union in order to raise the standard of living of its peoples. However, ECOWAS countries have a GDP that differs from one country to another, with a maximum value at the level of Nigeria. The economic situation of ECOWAS can be summed up in the following table:

Table 1. Overview of the main information about ECOWAS

Number of countries	15 countries
Population (2015)	348 million (Nigeria: 181,1 million – Ghana: 27,5 million – Côte d'Ivoire: 23,1 million)
Area	6 140 000 Km ²
Currency	8 UEMOA countries in common French and the FCFA currency. 7 countries with their own currency 2020 is the planned date for the creation of a single currency
GDP	620,44 \$ Billion in 2016, compared to 619,04 Billion in 2015
Rate of Growth	0,23% in 2016, compared to 3,1% in 2015 ³

Source: CNUCED, WORLD BANK

The Economic Community of West African States was created on the basis of several objectives. The aim is to promote cooperation and integration in the perspective of a West African Economic Union with a view to raising the standard of living of its peoples. To achieve this goal, the community has developed a trade policy aimed at increasing intra-regional trade, increasing the volume of trade and generally promoting economic activities in the region so as to positively affect the economic well-being of the citizens of ECOWAS. However, the community's regional policy is grounded throughout different strategies to stimulate regional economic development.

According to the macroeconomic data of West African states, and overall, the consumption of residents far exceeds the government's public consumption. Similarly, imports are well above exports in the data of each Member State. While imports are treated as a negative element, this situation will certainly have an impact on the balance of payments as well as on the current account balance of ECOWAS members. Indeed, the international economy of these states is more directed towards imports. In this respect, Liberia, for example, achieves the highest score in terms of household consumption, which is accompanied by the highest import rate and the lowest level in this region.⁴

4 MODELLING THE RELATIONSHIP BETWEEN HUMAN CAPITAL AND ECONOMIC GROWTH

As an application of the theoretical remarks discussed above, I will begin modeling the relationship between economic growth and human capital via a multiple regression model based on a panel of time series from 1991 to 2014.

Indeed, our approach on this part is essentially to present the results of the economic regression of our basic model. These results are obtained with the STATA software after data collection from different sources such as the World Bank and UNCTAD, and compiling into an Excel table. Our expectations are that the results of these estimates corroborate our theoretical

³ The growth rate is calculated by the following formula : $\frac{PIB(N)-PIB(N-1)}{PIB(N-1)}$ with : GDP = constant GDP 2010

⁴ Interpretation of data removed from the World Bank database

developments and, to a lesser extent, some of the results of previous work on the relationship between economic growth and human capital.

4.1 PRESENTATION OF THE MODEL

In the scientific interest of evaluating the evolution of the relationship between human capital and economic growth, the choice of variables is summarized in the following table:

Table 2. Table of model variables

Variable	Definitions	Nature
GDP	Gross Domestic Product (GDP)	Endogenous variable
CH	Human capital	Exogenous variable
Capital	Capital stock	Exogenous variable
L	Employment level (Labor)	Exogenous variable

Starting from the Schumpeterian theory and the Solow growth model, the regression model is written in such a way that it can respect the theoretical remarks. For this purpose, the regression model is as follows:

$$\text{GDP} = \text{Human capital} + \text{Stock. Capital} + \text{Labor}$$

4.2 REGRESSION AND MODEL SIGNIFICANCE TEST

This is done using the Ordinary Least Squares (OLS) method to estimate the parameters. This will not only ensure the potential significance of the various variables and thereby judge the relevance of the model but also verify the various assumptions made. It should be noted that these variables will all be transformed into logarithms in order to simplify the model by eliminating the increasing variability and seasonal patterns of each variable. As a result, the equation of the model is written in the following form:

$$\text{LogGDP} = C + \alpha_{CH}\text{LogCH} + \alpha_{cap}\text{Log Capital} + \alpha_L\text{LogL} + \varepsilon_t$$

The analysis of the significance of the coefficients of the model will be done in two steps: the analysis from the point of view of the overall quality on the one hand and that of the individual quality of the coefficients on the other hand. First, I will ask about the overall significance of the model, that is, whether all the explanatory variables have an influence on the dependent variable. This test can be formulated as follows: is there at least one significant explanatory variable?

The assessment of the overall quality of the model is done with Fisher's statistics; which indicates if the explanatory variables have an influence on the dependent variable. Either the next hypothesis test:

H₀: all the coefficients of the model are null

H₁: there is at least one non-zero coefficient

However, the procedure is to use Ordinary Least Squares (OLS) to estimate the parameters. The result is displayed on the following table:

Table 3. Output of the model regression from Stata

OLS regression: Log GDP estimate				
	SS	Df	MS	
Model	155.50714	0.5352878	0.5427759	
Residue	18.7976007	416	0.04518654	
Total	174.30474	419	0.41601767	
	Log CH	Log L	Log Capital	C
Coefficient	0.4950833	0.5352878	0.5427759	0.812002
Residue	0.1282366	0.0627754	0.0627754	0.2040082
t- Statistics	3.86	8.53	10.68	3.98
Probability	0.000	0.000	0.000	0.000
Result	Significant	Significant	Significant	Significant
R²	0.8922	Observation number	420	
R² adjusted	0.8914	F (3, 416)	1147.15	
Root-MSE	0.21257	Prob (F-Statistic)	0.000000	

Source: Result obtained from the STATA software

4.2.1 SPECIFICITY TEST OF THE MODEL AND PARAMETERS

With a total of 420 observations, all the component variables of the model have a significant regression coefficient and the constant. I find that the model specification is validated.

Based on the following regression indicators, I find a high representativeness justified by the R^2 and the adjusted R^2 , with a rate close to 90% of significance. Even more so, Root-MSE is a predictive power metric that accurately compares the prediction errors of different models for a particular dataset. Although it is sensitive to outliers, the Root MSE is raised to 0.212 which reinforces the reliability of the presented model and the absence of auto-correlation.

The specificity indicators of the estimators are all significant in the sense of Student's view that the probability is less than 5% (it has a value of zero).

4.2.2 HETEROSCEDASTICITY TEST OF RESIDUES

At this level, I will verify the hypothesis of heteroscedasticity of disturbances and autocorrelation of errors by the Breusch-Pagan and Cook-Weisberg test.

Table 4. Output of the heteroscedasticity test from Stata

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity	
H_0 : constant variance	Variables: LogGDP
Khi2 (1) = 5.08 (Probability = 0,0242	Result: Significant

Source: Result obtained from the STATA software

The results of the heteroscedasticity test show that all the probabilities associated with the coefficients are all greater than 0.05. So, I reject H_1 hypothesis of heteroscedasticity and assume homoscedasticity of residues.

4.2.3 MULTICOLLINEARITY TEST OF THE VARIABLES

To do this, I will establish the VIF test (ie: Variance inflation factor), which will study the multicollinearity of the econometric model variables. According to the following table, the test results show that the average FIV is less than 10. This indicates that it would be possible to exclude the presence of multicollinearity in our model instituted.

Table 5. Output of the Multicollinearity test of the variables from STATA

Variable	VIF	1/VIF
LogCapital	9.31	0.5427759
Log L	9.15	
Log CH	1.08	0.04518654
Average of VIF	6.51	0.41601767

Source: Result obtained from the STATA software

4.3 RESULTS AND DISCUSSION

In conclusion, I will interpret the results of our econometric study to obtain information on the nature of the relations between human capital and growth in the case of the ECOWAS countries.

The observation of the results of our model, allows us first of all to note that the coefficients of the estimation of the model are all positive and are quite consistent with those expected. First, the model reveals that, obviously, factors of production have a positive impact on the growth of economic growth. Indeed, the coefficients of Labor and Capital Stock have a positive sign and a high rate of 53.52% for labor and 54.27% for Capital. As a result, these variables are positively correlated.

In this same sense, the coefficient of the human capital variable is also positive at about 49.5%, this reinforces the role played by human capital as stimulating economic growth in the countries of this African regional grouping.

Moreover, our empirical approach allows us to establish a multitude of simulations to appreciate the relationships that exist between these different components. As a result, the model results can be interpreted as follows:

- If the value of the « human capital » variable varies by 1%, the value of the GDP will vary by 0.49% in the same direction.
- If the value of the variable « Labor » increases by 1%, the value of GDP will increase by 0.535%.
- If the value of the variable « Capital » increases by 1%, the value of GDP will increase by 0.542%.

From the results of the model, it is clear that improving the human capital stock has a positive effect on economic growth in the ECOWAS community. Indeed, promoting quality education, as well as health, is a powerful strategy to promote economic factors of production. Notwithstanding, this depends on the ability of the economy to channel its human resources into activities that generate progress and development.

5 CONCLUSION

In theory, human capital refers to certain skills that qualify the individual, such as skills, experience and especially knowledge. Therefore, it plays a significant role in promoting development that works by analogy to the impact of financial and physical capital. Including training and health, investment in human capital generates positive externalities on the economy through the promotion of productivity and technical progress (Becker, 1964).

Following numerous studies carried out on this subject, the impact of human capital on growth and development is well established. But again, our empirical approach has given us ample opportunity to develop correlation estimators that validate the positive relationship that links economic growth to work, capital and especially to human capital. Although, economic development differs from one country to another, from one nation to another, and from one regional group to another. Our study affirmed that this optimistic report is also verified at the level of the ECOWAS group.

What is important is that economic actors and political, economic and social authorities must invest in human capital. In other words, this means that an expansionary public policy in favor of growth drivers, mainly education, is very necessary for the development of economic growth. In order to improve the general standard of living in the community, it would be wise to strengthen the improvement of the education system and the promotion of health in all the member states of this group.

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