



AGGREGATE DETERMINANTS OF LIVING STANDARD OF THE POPULATION IN THE DEMOCRATIC REPUBLIC OF CONGO: AN ANALYSIS OF THE ECONOMY OF GROWTH FROM 1960 TO 2016

ANGOEZI KALIA Papy 

Université Chrétienne Bilingue du Congo (UCBC)

papyangoezi@gmail.com, pap.angoezi@ucbc.org

MIYISA MUHIWA Benedictus

Université Chrétienne Bilingue du Congo (UCBC)

miyisamuhiwa@gmail.com, benedictus.muhiwa@congoinitiative.org

Abstract

At the independence in 30th June 1960, the Democratic Republic of Congo existed as a "state". Households are spending on consumption, the state collects taxes, the population is growing, households and businesses are saving, the country is overflowing with renewable and non-renewable natural resources whose invaluable value and imports dominate, at the same time mineral exports are on behalf of the State. Since its independence, how the various operations above affected Congolese standard living? with GDP as an indicator under two assumptions that we have made in the following pages. This is an analysis of the behavior of macroeconomic aggregates based on the model of general equilibrium in open economy while incorporating population growth, in the perspective of the economy of growth. The deductive and explanatory method, are used in this study, supported by the documentary technique in data collection and the statistical and econometric techniques for modeling. The endogenous variable is then explained by expenditure on household consumption, government expenditure, population growth, gross domestic savings, exports and imports of goods and services. After analysis, the results show that spending on household consumption, government spending, gross domestic savings all with a positive coefficient and imports with a negative coefficient explain significantly and individually GDP per capita in the DRC. In addition, population growth and exports with

positive coefficients do not significantly explain per capita GDP in the DRC. But the model is globally significant at 88%. So the income of the Congolese is still far from provides him a perfect improvement in his standard of living.

Keywords: Determinants, Level, Life-GDP, Economy, Growth, Congo

INTRODUCTION

Until 2015, at the evaluation of the MDGs, the DRC is the country with the highest density of poverty in the world. According to the World Bank, 88% of its population lives below the poverty line (<http://www.worldbank.org>). And yet The Democratic Republic of Congo is among the potentially rich countries of the world in mineral, hydraulic and vegetable resources. It has almost all the raw materials that drive all sectors of modern industry, for which mineral resources alone are estimated at \$ 24 trillion.

The Democratic Republic of Congo has the largest deposit of exploitable hydroelectric power of about 100,000 MWH that could supply all Africa and Europe, either 13% of the global potential. Inga alone takes 44,000 MWH. This apart from other sources of production (gas, solar, biomass, nuclear, etc.(MISEREROR-CEPAS, Avril 2017)

The DRC owns 50% of Africa's forest reserves, either 17% of the world's reserves. Belgian and American researchers have estimated the DRC's natural pastures to more than 5 million hectares, from which some demographers have estimated that Congo Kinshasa soil could feed up to 850 million people for 50 years. And many species of animals in the country's national parks and several sites that can create a tourist attraction from around the world.

Despite its immense resources, its population is very poor: 67.3% to 72% of the population living below 1.9 USD per person. (INS/RDC, Septembre 2014).

At independence in 1960, the Congo Democratic Republic existed as a "state". State functions according to Musgrave (VANHOVE, 2015) are: the allocation of resources by the production of collective goods and services, the distribution of income in the form of wages and the regulation of economic and social activities by regal texts.

From the above functions, we think that the first and the third functions are functions in which the State intervenes directly and these functions play a facilitating role to the second function "income distribution in the form of wages". It is the foundation of everyday well-being and that, in large part, the state makes it to be done by the population for its well-being. It is the consumption of households which depends on the income of the activities they perform in private enterprises or on behalf of the State; investments that depend on household savings for the most part; exports and imports that depend on household demand. The domestic product is

only a reflection of the behavior of household consumption, government spending, savings, exports and imports. In our analyzes we have also considered the demographic pressure that is considered by some economists as part of the poverty trap, as poor countries are characterized by low income and savings capacity, demographic pressure beyond economic capacity will undermine the quality of life. (RAFFINOT, 2015)

Since 2002, the country has registered a positive growth rate of more than 0% while from 2011 to 2015 it has recorded a growth rate above the African average of 6% , respectively 6.9% in 2011, 7.2% in 2012, 8.5% in 2013, 8.9% in 2014, 7.7% in 2015 and, 2.5% in 2016 (BCC, 2016). From a theoretical point of view a positive growth rate assumes that there have been enough values created and distributed, more employees have worked in companies to create values, more exports of productions, more taxes collected to ensure the great work of the state (government expenditure), according to these facts, an improvement in the standard of living of the population, therefore a reduction of poverty.

Of all the above, what impact has the consumption of households, government spending, population growth, gross domestic savings, exports and imports of goods and services on the standard of living of the population in democratic republic of Congo in a global way?

This article aims to demonstrate how the various macroeconomic aggregates mentioned above affect the standard of living of the population in the Democratic Republic of Congo. This in a growth economy analysis.

MATERIALS AND METHODOLOGY

Design

This study uses the deductive and explanatory method. The deduction makes it possible to consider the universal theories of general equilibrium, to deduce the behavior of macroeconomic aggregates in the particular context of the Congolese economy. The explanatory method makes it possible to provide plausible explanations for the behavior of the macroeconomic aggregates and the observed socio-economic realities.

Techniques

The methods used are supported by the documentary technique, the statistical and econometric technique.

- The documentary technique, allowed to collect quantitative data including: national statistics in relation to the various macroeconomic aggregates considered, ...

- The statistical and econometric technique allowed to model the studied phenomenon, to test the validity of the hypotheses related to it, by resorting to the software Eviews 7.

Theoretical framework

The underlying theory of this research is the theory of endogenous development that supports a policy whose essential role is to make the territory the source of development. Called also self-centered or agropolitain, it is for J. Friedman "the expression of the faith in the aptitude of a people to progress in the direction which it has chosen". In other words, "It is no longer an external demand that defines growth, but needs internal to the area considered above all that defines growth.» (Aydalot, 1985).

Conceptual and operational framework

From a conceptual point of view, the standard of living of the population (endogenous variable) is explained by the final consumption of households; The final consumption of the government; Population density; Gross domestic savings; Exports of goods and services; Imports of goods and services.

Table 1. Operationalization of the variables

THEORETICAL VARIABLE	OPERATIONAL VARIABLE
Standard of living of the population	Value of current GDP per capita
consumption of households	consumption expenditure of households
Government's expenditures	The amount of Government expenditures
Population pressure	Number of inhabitants
Gross domestic savings	Gross domestic savings amount
Exports of goods and services	Value of goods and services exported
Imports of goods and services	Expenditure on imports of goods and services.

This leads to the theoretical model below:

$$Y = a_0 + a_1X_1 + a_2X_2 + \dots + a_nX_n$$

In the modeling The GDP is consider as an indicator of the standard of living in two hypotheses hereafter:

- 1 ° Continuous growth over the long term is a broadcaster of an improvement in the standard of living of the population
- 2 ° As the GDP is the sum of the income received by employees, firms, shareholders, the State and for other profits, these incomes come back in one way or another to households.

Nature and Source of the data

The data analyzed in this article are secondary quantitative data obtained from the World Bank Database 2017. <http://perspective.usherbrooke.ca/bilan/tend/COD/fr/NE.RSB.GNFS.CD.html>

RESULTS

After econometric analysis of the data, the following table shows:

Table 2. Model Estimation By OLS (EViews 7)

Dependent Variable: GDP					
Sample (adjusted): 1964 2016					
Included observations: 53 after adjustments					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C	-11.78203	3.98	-2.95	0.01	
CONSON	147.0156	11.97	12.27	0.00	
DEPGOUV	34.36322	12.54	2.73	0.00	
DEMOG	2.95E-06	0.00	0.01	0.98	
EXPORT	52.28428	30.65	1.70	0.09	
IMPORT	-66.52303	34.16	-1.96	0.05	
EPARGNE	28.01857	9.14	3.06	0.00	
R-squared	0.88		Mean dependent var	1.26	
Adjusted R-squared	0.87		S.D. dependent var	78.17	
S.E. of regression	28.29		Akaike info criterion	9.64	
Sum squared resid	36834.21		Schwarz criterion	9.90	
Log likelihood	-248.62		Hannan-Quinn criter.	9.74	
F-statistic	58.47		Durbin-Watson stat	1.44	
Prob(F-statistic)	0.000				

The estimated equation is:

$$PIB1 = C(1) + C(2)*CONSO + C(3)*DEPGOUV + C(4)*DEMOG + C(5)*EXPORT + C(6)*IMPORT + C(7)*EPARGNE$$

$$PIB1 = -11.78 + 147.01*CONSO + 34.36*DEPGOUV + 2.9e06*DEMOG + 52.2*EXPORT - 66.52*IMPORT + 28.01*EPARGNE$$

The individual significance test of the parameters (Ci) (Student's test)

H_0 : $B = 0$ the variable does not significantly explain GDP per capita

H_1 : $B \neq 0$ the variable significantly explains GDP per capita

As t-calculated is greater than theoretical t ($= 1.96$) or simply because the probability associated with t-calculated is less than or equal to 0.05, for the variables CONSO, DEPGOUV, IMPORT and SAVINGS, we reject H_0 thus the consumption of households, government spending, imports and gross domestic savings explain significantly and individually per capita GDP in the DRC otherwise as t-calculated is more than theoretical t ($= 1.96$) or just as the probability associated with t-cal is greater than 0.05, for the DEMOG and EXPORT variables, then H_0 is maintained, so population growth and exports do not significantly explain GDP per capita in the DRC individually.

The overall significance test of the model (Fisher test)

H_0 : the model is not globally significant

H_1 : the model is globally significant

Since the probability associated with F-calculated = 0.00000 is less than 0.005, we reject H_0 : so, the model is globally significant

The coefficient of determination

We found that $R^2 = 0.88 = 88\%$ and adjusted R^2 is $0.868 = 87\%$ both values are close which means that the model is well adjusted and that the variations in GDP per capita are explained in 88% by consumption of households, Population growth, Government expenditure, gross domestic savings, exports of goods and services, imports of goods and services in the DRC.

Testing Classic Assumptions

Heteroskedasticity test

H_0 : absence of heteroscedasticity

H_1 : presence of heteroscedasticity

Table 3. Heteroskedasticity Test: White (EViews 7)

F-statistic	2.323346	Prob. F(27,25)	0.0187
Obs*R-squared	37.89690	Prob. Chi-Square(27)	0.0795
Scaled explained SS	93.52192	Prob. Chi-Square(27)	0.0000

We note that the associated Probability NR^2 (P-value) = 0.0795 > 0.05, so we do not reject H_0 so there is no heteroscedasticity. So our model is homoscedastic.

Autocorrelation test for D-W errors

H_0 : D-W = 2: there is no autocorrelation of errors

H_1 : D-w \neq 2: there is autocorrelation of errors

RULES OF DECISION

When the DW statistic is close to 2, we assume the absence of autocorrelation of the errors. We find that D-W = 1.6, so we can assume the absence of Auto Correlation of Errors Precision with the BRESH-GODEFREY test

H_0 : There is absence of Auto Correlation of Errors

H_1 : Auto Correlation of Errors

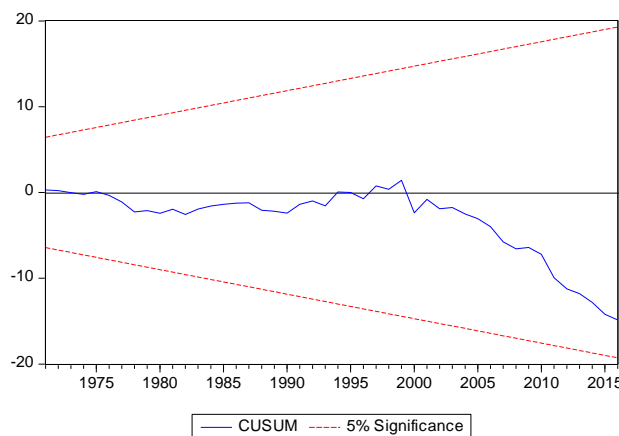
Table 4. Breusch-Godfrey Serial Correlation LM Test: (EVIIEWS 7)

F-statistic	0.293458	Prob. F(2,44)	0.7471
Obs*R-squared	0.697661	Prob. Chi-Square(2)	0.7055

We note the P-value associated with NR^2 = 0.7055 > 0.05, so we do not reject H_0 we conclude that there is no self correlation of errors of order 1.

Parameter stability test: the CUSUM Test

Figure 1. Parameter stability test: CUSUM



We note that the model has remained stable because the blue bar does not cut any of the red bars.

DISCUSSION OF THE RESULTS

The results of this analysis shows the standard of living of the population is globally determined by household consumption, population growth, government expenditure, gross domestic savings, exports of goods and services, imports of goods and services. services in the DRC. The model looks like:

$$PIB1=11.78+147.01*CONSON1+34.36DEPGOUVN1+2.9e06*DEMOG1+52.2*EXPORTN1-66.52*IMPORTN1 + 28.01*EPARGNEN1$$

Discussion of the behavior of exogenous variables

Final consumption of households

Each unit of increase in household consumption has a significant improvement effect on the standard of living of the population in the Democratic Republic of Congo during the period under study.

Looking at the evolution of the DRC's consumption from 1960 to 2016, from the graph below, it is constant that household consumption expenditure has a growing trend:

A growing evolution of expenditure of final household consumption at the aggregate level indicates that the population does not yet have an adequate standard of living and the continues to struggle in meeting the needs of basic necessities (food, health, clothing,...) as described. by Maslow.

According to Engel's law (VANHOVE, 2015), the part of income allocated for consumption decreases as income rises. So, the income of the Congolese is still far from him provides a perfect improvement in his standard of living.

Government expenditures

Any increase in the government's expenditure has an effect of improving the standard of living of the population in the Democratic Republic of the Congo.

Whereas for Smith (Dione, 28 Septembre 2016) "Tax can hinder the people's industry by discouraging the industry from engaging in certain branches of commerce or work, which provide a lot of people with occupation and livelihoods." This is based on the logic of Laffer's theory that "too many taxes kill taxes, which should lead to a negative correlation.

In the case of the DRC We believe that given the weak industrial production structure, it is rather the use of taxes that has a positive effect on the standard of living of the population. (Salary of the agents of the State, good and non-marching service).

Population Growth

The results of the research demonstrate that each unit of population growth has a positive effect on the standard of living of the population in the Democratic Republic of Congo during the period from 1960 to 2016 and is statistically insignificant. Contrary to the Malthusian theory of the relation between population and production, the result obtained supports the theory of Ester Boserup. (Boserup E. , 1970)

For Malthus the man passively undergoes the demographic hazards, whereas for Boserup the man knows how to react and adapt. The idea of Malthus is such that if the supply is no longer sufficient, the population surplus dies. Boserup does not agree with this, and sees in the story a more interesting movement that shows that when the supply of food is no longer enough, man will invent something (technique, machine, etc.).) to increase this supply and to get back on the water (Boserup E. , 1981). This is exactly the case with the population of the Democratic Republic of Congo able to react and adapt to survive. The number is note yet a problem.

Exports of goods and services

The results of the research demonstrate that each additional unit of goods and services exported has a statistically insignificant effect on improving the standard of living of the population in the Democratic Republic of the Congo.

Imports of goods and services

Each additional unit of imported goods and services has a deteriorating effect on the standard of living of the statistically significant population in the Democratic Republic of Congo.

What is connected with the thought of Keynesians, in the concept of the balance of the national income, according to which any increase of the imports has a perverse effect on the national income, consequently the standard of living of the population . (Dameron, 2001).

The Congolese population is estimated at 86,895,208 inhabitants in 2016 (<http://perspective.usherbrooke.ca>) all other things being equal: a Congolese (poor country) consumes 1.25 USD per day

(Zammin, 2010). , therefore a consumer demand of \$ 108,619,010 per day, 80% satisfied by imports, therefore, \$ 86,895,208 per day and \$ 31,716,750,920 per year which are transferred out of the country, 5 times the annual budget from the country. This would be an important local market for competitive local businesses in the DRC and the development effects of development.

Gross domestic savings

Any increase in gross domestic savings has a significant improvement effect on the standard of living of the population in the Democratic Republic of Congo

Savings are the unutilized portion of income. According to economic theory, the amount of savings depends on the amount of investment. Today's savings therefore ensure investment and the level of employment of tomorrow (Paul KRUGMAN et robin WELLS, 2013).

CONCLUSION

This article analyzed the behavior of macroeconomic aggregates based on the model of general equilibrium in open economy. This is to deduce the determinants of the standard of living of the population in the DRC. The period considered for the analysis goes from 1960 to 2016. This analysis was carried out with a view to the economy of growth where GDP is the indicator of the standard of living of the population under two hypotheses. 1 ° Continuous growth over the long term is a sign of an improvement in the standard of living of the population; 2 ° Since GDP is the sum of the income received by employees, firms, shareholders, the State and for other profits, these incomes come back in one way or another to households.

This endogenous variable is then explained by expenditure on household consumption, government expenditure, population growth, gross domestic saving, exports and imports of goods and services.

The deductive and explanatory method, were used in this study, supported by the documentary technique in data collection and the statistical and econometric technique allowed to model the studied phenomenon, to test the validity of the related hypotheses.

After analysis, the results show that household consumption expenditure with a positive coefficient, government expenditure with a positive coefficient, gross domestic savings with a positive coefficient and imports with a negative coefficient explain significantly and individually the GDP per capita. DRC. In addition, population growth and exports with positive coefficients do not significantly explain per capita GDP in the DRC. But the model is globally significant at 88%. So the income of the Congolese is still far from him provides a perfect improvement in his standard of living.

In Term of new knowledge; in the DRC, the period from 1960 to the present day, primo: exports have not yet demonstrated a significant impact in improving the standard of living of Congolese. Much remains to be done for self-reliant or agropolitain development in this area. Secondly, the Congolese people know how to react and adapt and their growth is not yet a brake on development. Tertio: the tax burden is still within acceptable limits because the coefficient is positive, so they do not constitute for the moment a bottleneck for economic

activities. Fourth: based on the exogenous variables considered, only imports have a negative and significant impact on the standard of living of the population, and as such they considerably limit the logic of self-centered or agropolitain development.

FURTHER STUDIES

We propose other researchers to investigate:

- The mechanisms to increase the contribution of exports in improving the living conditions of the population of the DRC especially as the country is full of raw materials necessary for all modern industries in the world.
- The optimal level of tax burden that maximizes state revenue in the DRC.
- Strategies for import substitution in the DRC.
- The correlation between savings and the level of investment.
- Strategies that make every Congolese man the center of his development and his country.

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