

Determinants of Domestic Savings in Congo - Brazzaville

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Abstract

This article analyzes the determinants of the domestic savings in Congo-Brazzaville. The results obtained from the vectorial model with correction of error show that in the long term, the terms of the exchange, the rate of inflation, the real interest rates, the gross domestic product per capita and the financial deepening moved of a period, explain the domestic savings. In the short term, the terms of the exchange, the rate of inflation and the real interest rates delayed a period on one hand, terms of the exchange, the gross domestic product per capita and the financial deepening, moved of two periods, on the other hand, affect the domestic savings. On the other hand long-term, these results show that the terms of the exchange, the inflation rate and the real interest rates delayed period, influence the domestic savings. These results allowed clearing some suggestions of economic policy in Congo-Brazzaville.

Keywords: Domestic savings, economic development, econometric model, Congo.

JEL Classification: E2, F63, C5, O55.

Introduction

The classics (Smith, 1776; Ricardo, 1817) consider the savings as a renunciation of the consumption. It constitutes an important component of the wealth on which the modern economies have to lean to finance their growth (Abdessamad, 2001). According to Lenseigne (1990) and the United Nations Conference on Trade and Development (UNCTAD, 2014), in Sub-Saharan Africa, the domestic savings remain insufficient, what would explain partially the strong rate of debts of these savings. For UNCTAD (2014, p.36), in 2012, the rate of domestic savings of the countries of Sub-Saharan Africa was 17.7% against 25.2% in the South Asian countries with intermediate income and 22.3% in Latin America and the Caribbean. This weakness would be understandable by the structural factors (age pyramid, level of income) and cyclical (low interest rate, existence of a vaste informal sector, weak development of the financial system).

In the countries of Sub-Saharan Africa, when the savings exist, she is not still mobilized effectively because of the inefficiency of the banking system. For lack of sufficient savings, the African countries have to resort to the outside loan or to the foreign financial support to finance their development, and Congo-Brazzaville does not escape this reality. Numerous works in the developed countries and in development, analyzed the determinants of the domestic savings. Harberger (1950) and Laursen and Meltzer (1950) have for example, studied in the rich countries, the incidence of the variations of the terms of the exchange on the domestic savings. These authors end in the results according to which the terms of the exchange influence positively the domestic savings.

McKinnon and Shaw (1973) in their works dedicated to the role of the deepening of the financial system in the impulse of the effort of savings, shows that the degree of financial deepening has a significant impact in the improvement of the domestic savings.

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The contribution of the domestic savings was widely approved, at the beginning of the years ninety, by the studies which concern the determinants of the national savings in Pakistan (Khan and *al.*, 1994). These studies find that the ratio debt on the gross national product and the ratio of dependence, affect negatively the national savings. However, some economists, such as Cardenas and Escobar (1998) suggested in Colombia, such as an increase of the ratio of dependence has an effect significantly negative on the rates of personal savings. Like many developing countries, the domestic savings in Congo-Brazzaville have remained low (UNDP, 2012) for the following reasons:

Indeed, the first two decades of the independence of Congo-Brazzaville were marked by the promotion of the economic and social development, with economic investments. During these decades, the domestic savings remained lower than gross investments. This situation continued until the decade 80 with the implementation by the government of reform economic and financial, in particular structural programs of adjustment and the membership of Congo on the Initiative of the Poor Countries Heavily Indebted (IPPTE). The situation overturned in the 1990s and 2000. In spite of the economic growth recorded by the country in the 2000s, the domestic savings are far from being superior to the gross national investment with an average rate of savings of the order of 3.5%² over the period from 1980 till 2014. This weakness of rate of savings would be understandable by the insecurity of the investments, the little incentive climate of the business, the attractiveness of the country for the foreign direct investments, the preference of the investors to expatriate in Europe or under other heavens (UNDP, 2012).

The objective of this study is to analyze from a vectorial model with correction of error, the determinants of the domestic savings in Congo-Brazzaville between the periods 1980-2014. To reach this objective, this work will be structured in four sections. In the first one, we analyze the literature review on the determinants of the domestic savings. In the second, we examine the evolution of the domestic savings in Congo-Brazzaville. In the third, we present the methodology of adopted analysis. In the fourth section, we estimate and interpret the obtained results. And finally, we shall try hard to clear some suggestions of economic policies.

1. Review of the literature

The question of the determinants of the domestic savings was the object of several theoretical and empirical works.

1.1. Theoretical review

The economic literature on the determinants of the domestic savings knew a development since the theories of the economic growth (Chicot Eboue, 1998; Koko Morou, 2007). Indeed, the theory which underlies the relation between the domestic savings and its determinants is based on the neoclassic model, in particular on the works of Fisher (1926) and Robertson (1966) who show that the savings influence the investment. The latter in turn, leads to economic growth that manifests itself in a positive effect on savings. From these works, an abundant literature on the determinants of the domestic savings [Keynes (1936), Friedman (1957), Modigliani and Brumberg (1954) and Ando and Modigliani (1963), Barro (1974) and Hayashi (1986), Ando and Kennichell and *al.*, (1987), Gersovitz (1988), Koulibaly (1997), Kotlikoff and Summers (1981), Masson (2010)] took shape.

Keynes (1936) for example, develop the myopic model. It shows that the horizon of the economic agent is limited and bounded in time. The individual lives from day to day and does not take into account events suthat may occur beyond this horizon. It also shows that the choices of consumption of the individual depend on his habits and his behavior towards the savings, that is, the way it directs its savings, or for motives for transactions or for the motives for precautions.

Friedman (1957) focuses on the permanent income. He finds that the economic agents make their consumption choices based on their permanent income. This means that it is their permanent income that constitutes their budget constraint. So, the temporary variations of their income have no significant impacts on the present consumption. This author concludes that the individuals make a smoothing of the use of their transitional income for purposes consumption over different periods of their life by means of the savings. Modigliani and Brumberg (1954) and Ando and Modigliani (1963), as for them, develop the model of life cycle. They show that the economic agents try to smooth the evolutions of their consumption on their whole life and plan that she will end by a period during which they will perceive no more income of activity.

² Rate calculated by the author, from the data of the World Bank (2016).

To do it, these agents take their capacities, in particular of savings and investment, during their active life to finance, during their pension a consumption that they wish to see growing during all the rest of their life or, in any case, that they do not wish to see decreasing for lack of sufficient financial means.

Barro (1974) and Hayashi (1986) focus on the hypothesis of intergenerational altruism. They find that the hypothesis of intergenerational altruism is a powerful motive for savings. Ando and Kennichell and *al.*, (1987) turn to the intergenerational solidarity, they assert that the inheritances are a shape of life annuity, the receiving elder sons help and care of their descendants in exchange for a promise of legacy. Besides, the works of Gersovitz (1988) propose an intergenerational approach to the savings on the relations of widened family. This author finds that the intergenerational links affect the behavior of consumption and savings through the preferences of the households and the extension of their actual horizon of schedule on which they make decisions of consumption and savings. On the other hand, Koulibaly (1997, p.396) deals with the interpersonal transfers in Black Africa. For him, in spite of the poverty which strikes this population, the individuals, in their great majority, proceed to transfers towards various social groups (parents, village, ethnic group, tribe ...). He concludes that transfers are rather expenses of insurances of all kinds and are of interprofessional or intergenerational economic calculations.

Kotlikoff and Summers (1981) insists on the dynastic or hyperopic model. They assert that the economic agent passes on resources to his children, because these transfers get for the household a certain utility. It means that the decision-making horizon of the household goes beyond its existence and that its present consumption depends on its intergenerational income which integrates the resources anticipated for the descent. By being inspired by works of Modigliani and Brumberg (1954) and Ando and Modigliani (1963), Masson (2010, p.119) explores the life of the saver. He highlights two approaches: the first approach which he qualifies as standard life cycle and economic psychology. This one finds that the saver can not adopt an outside and objective point of view towards his own existence. The second approach (known under the name of the existential approach of life cycle) on the other hand, show that the life of the saver is not reduced to a simple question of optimization. But, it is apprehended from its human subjectivity and from the situational context in which it is.

1.2. Empirical review

Much empirical works were realized on the determinants of the internal savings in a number of country presses and in development. In the rich countries, Deaton (1977) and Davidson and *al.*, (1979) studied in the United Kingdom the link between the internal savings and the inflation. They reveal a strong positive correlation between both variables. Bulkley (1981), Ouliaris (1981), Koskela and Viren (1982) in a study concerning the savings and inflation, confirm this result. Daly (1983) and Dicks-Mireaux (1988) in a study on the savings of the households and the public diet of pension, find that the savings of the households would decrease with the presence of a public diet pension. Horioka (1986) examines on the basis of the Japanese data, the relation between the age pyramid and the domestic savings. He argues that the transformation of the age pyramid reduces the rate of savings. These results will be corroborated later in the years 1988 and 1989, by the works of Heller (1988) for the case of seven countries of the O.C.D.E and Hageman and Nicoletti (1989) for the case of the Federal Republic of Germany.

Allard (1991) measures the behavior of the savings in France. For this author the increase of the life expectancy has the effect of increasing the rate of savings, every individual needing to accumulate a higher holdings. In the same study, Allard (1991) notices that the size of the households and the number of women in work play a positive role in the determination of the global rate of savings, by influencing the intertemporal profile of the consumption and the included incomes. On the basis of data concerning Canada, Bérubé and Côté (2000) wonders about the determinants of the rate of savings of the private individuals. For them, an increase of the population of more than 65 years old decreases the rate of savings by the fact that the retired people save less than the working population. At the level of the inactive young population, these authors find that an increase of this one decreases the rate of savings because of the relatives who save less to meet the needs for their family. Fournier and Vaillancourt (2011) explore the determinants of the savings of the households in Quebec. Their results show that the income of the household after tax, is influenced by socio-economic factors: the fact of being a tenant or an owner, the only employee of the household, the part-time worker, parent of children from 0 to 17 years old, and to hold the insurances in the household; so many factors are which impact negatively on the savings.

In a recent study (2012), Mara and Vaillancourt studies the macroeconomic determinants of the savings in Quebec and in Canada. They resorted to the techniques of cointegration and vectorial model with correction of error (VECM) of Johansen over the period of 1981-2010. These authors obtain in Quebec, positive effects of the net wealth, the mortgage and the real interest rate on the rate of savings. The contributions to the diet registered by retirement savings, the participation of the women in the labor market exercise negative and permanent effects on the savings. The consumer credit and the inflation, have effects respectively, negative and unimportant. In Canada, they find a positive incidence and a permanent employee of the net wealth, consumer credit, the mortgage and the interest rate on the rate of savings. In the long term, the participation of the women in the labor market impacts negatively on the rate of savings. On the other hand, in the short term, this participation influences positively the rate of savings.

In the little developed countries, several studies analyzed the determinants of the domestic savings. Kessler and Strauss Kahn (1984) was interested in the link between the domestic savings and the inflow of outer capital. These authors obtain negative effects between both variables. Gupta (1987) and Balassa (1992) find positive effects between the real credit interest rates and the savings. Dhaneshwar and *al.*, (1995), on the basis of the temporal data of 39 Sub-Saharan African countries, show that the gross domestic product per capita, the macroeconomic stability, the inflation, the ratio of the budget deficit, the currency and the foreign aid exercise a positive impact on the internal savings. The ratio of dependence has a negative and significant incidence on the savings. The increase of the ratio of the foreign debt with regard to the exports has a not linear relation on the internal savings. The variations of the terms of the exchange have none significant impact on the level of the savings. Edwards (1996) goes to the same sense when it studies from a panel of 25 developing countries for the period 1986-1992, the impact of the growth rate of the per capita income, the public savings, the ratio of monetization and the social security on the internal savings.

Hallaq (2003) in a study on the data Jordanian ends in a conclusion showing that the real interest rate, the inflation rate and the terms of trade have not significant effects on the level of private savings. Modigliani and Cao (2004) finds in their works realized in China, positive effects between the long-term growth rate, the inverse of the ratio dependence and the rate savings. As for Athukorala and Sen (2004), they lean on an econometric model to study in the case of India, the determinants of the private savings. They end in the results according to which the terms of the trade and the domestic funds transfers of national living abroad exercise a negative influence on the savings. They also notice a positive influence of the real interest rate, the growth of the per capita income, the deepening of the financial system and the inflation rate on the domestic savings.

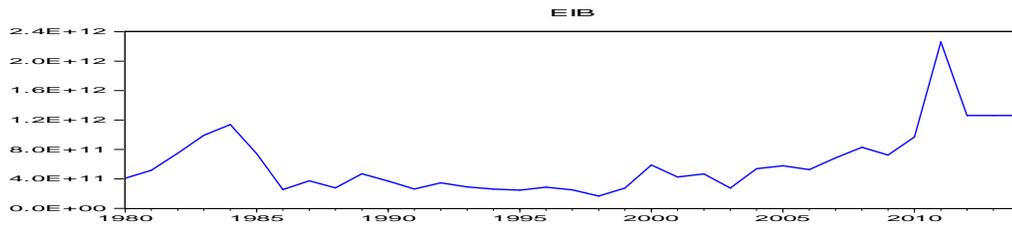
Kavatiri (2005) studies the determinants of the domestic savings in Rwanda. From the method the slightest ordinary squares, the author shows that the domestic savings impact in 96% on the credit real interest moved of period, on the variation of the interest real creditor, the difference of the inflation, the inflation delayed period, political instability and structural adjustment. On the other hand, the budgetary balance exercises a not significant negative influence on the savings. The gross domestic product per capita influences positively the domestic savings and the inflation in more impact on the internal savings with regard to other variables. Koko Morou analyzes in 2007, the determinants of the domestic savings in the Ivory Coast and ends in the following results. In the short term, the level of the domestic savings has a positive incidence on the current balance, the fluctuations in the price of the cocoa, the terms of the trade, the financial deepening, the inflation rate and the passing gross domestic product. On the other hand, the nominal interest rate, the budgetary balance and the rate of outside debts impact negatively on the savings. In the long term, the domestic savings have a positive effect on the current balance of the economic relations with the outside, the permanent income, the income per capita, the fluctuations in the international prices of the cocoa, the tax revenue and the inflation. The interest rate and the public spending do not influence the rate of internal savings.

This review of the literature suggests that in the developed countries, the theoretical works emphasize the neo-classic models, nearsighted, permanent income, life cycle and intergenerational solidarity to justify the determinants of the domestic savings, while in the little developed countries, the works insist on the macroeconomic variables, such as the inflation, the terms of the exchange, the ratio of dependence and the foreign aid. A study of the evolution of the domestic savings in Congo-Brazzaville is imperative to appreciate better these determinants.

2. Evolution of the domestic savings in Congo-Brazzaville

The analysis of the domestic savings in Congo-Brazzaville shows that this one knew an unstable growth on the whole studied period. In the light of the statistical data on which we lean, we can highlight three big periods to arrest better this evolution of the internal savings (Chart 1).

Chart 1: Evolution of the domestic savings in Congo-Brazzaville



Source: author from the data of the World Bank (2016).

The first period goes from 1980 till 1986, and is characterized among others from 1980 till 1982 by a strong movement of savings. This period is also marked by a peak of internal savings in 1983 followed by a strong reduction. This evolution is attributable in several factors:

In the first place, by the bright spell of the oil market which generates resources important for the State, thanks to its important recipes. Secondly, by the slump in prices of the barrel of oil, the US dollar, the inadequacy of the economic policy adopted in reaction to the stagnation of the economic activity with a worsening of the outer imbalance and the financial situation of the State. In it is added the increase of the debt servicing outside which reached unbearable levels (UNDP, 2012).

The second period goes from 1987 till 2003, it is marked by a strong fluctuation around a trend which is characterized by a low increase of the domestic savings. These fluctuations are attributable according to the United Nations Development Program (UNDP, 2012, p.38), to the devaluation of the Franc of the African Financial Community (FCFA) in 1994³. The negative effects of the devaluation were translated by an increase of the interest rates, a deterioration of the terms of the exchange, a reduction in the foreign direct investments, an increase of the growth rates of the gross domestic product and an increase generalized by consumer prices, reaching 29% at the end of the year on 1994, before falling again to 5.5% at the end of the year on 1995.

The third period goes from 2004 till 2014, it is characterized by an increase of the domestic savings until 2011. From 2009, we attend an exponential growth of the domestic savings accompanied with a peak in 2011, but which stabilizes over the period 2012-2014. The evolution of the domestic savings during this period holds the rise of the courts of the barrel of oil and the context of over-liquidity banking (UNDP, 2012, p.49). It emerges from the evolution of the domestic savings in Congo, that this one knew an irregular trend. An econometric model will allow us to confront the theoretical approaches with variables held in the Congolese case, in take out again some elements of economic policy.

3. Methodology of the research

3.1. Specification of the empirical model

The specificity of our model is inspired by the works of Kavatiri (2005) on Rwanda and the studies of Koko Morou (2007) on the Côte-D'ivoire. This model appears as follows:

$$EIB_t = \alpha_0 + \alpha_1TEC_t + \alpha_2TIF_t + \alpha_3TIR_t + \alpha_4PIB_Ht + \alpha_5APF_t + \epsilon_t \tag{1}$$

The explained variable is the domestic savings (EIB), which is the portion of the available domestic income not allocated to the spending of final consumption of the households, the companies or the state. The explanatory variables are the terms of trade (TEC). They express for a country the ratio between the prices of exports and the imports. The inflation rate (TIF), which is the phenomenon of the increase generalized by the prices. The real interest rates (TIR) indicate the prices of the public and semi-public bonds. The gross domestic product per capita (PIBH), it is considered as an indicator of the level of economic activity.

³ The theory teaches us that the devaluation has for objective of booster the competitiveness of the state economies, consequently the economic growth. It turns out that in Congo, this devaluation did not lead to the expected effects. It can be explained by the fact that the Congolese economy is an extrovert economy and mono exporting (oil, wood) which negotiates in Dollar. This devaluation was translated by a revaluation of its exports and an increase of the general level of the prices.

As for financial deepening (APF), represented by the ratio (M2/PIB), it indicates the accumulation of financial assets to a rhythm faster than the accumulation of non-financial assets (Shaw, 1973). The used data are stemming from the World Bank for the gross domestic savings and the financial deepening. Those concerning inflation rates result from the National Center of the Statistics and from the Economic Studies (CNSEE). As for the data on the terms of the exchange, the real interest rates and the gross domestic product per capita, they come from the site of Sherbrooke. The data cover the period going 1980 till 2014. We justify this choice by the unavailability of the statistical data in Congo-Brazzaville.

3.2. Results of the study

The study uses the econometrics of the temporal series. The used methodology is an approach in three stages. We begin the analysis with the tests of stationarity to determine the order of integration of variables, then the test of cointegration of Johansen to detect the cointegration, and when the best specification to analyze the domestic savings is held, we proceed to the estimate of the vectorial model of Johansen.

3.2.1. Tests of stationarity

A series is said still if its average and variance are constant in the time and if the value of the covariance between two periods of time depends only on the distance or the gap between these two periods. In this work, we chose the test of Dickey-Fuller Augmenté (ADF) and the test of Phillips and Perron (PP). The results of the tests are presented in the picture below.

Table 1: Stationarity test ADF and PP

Variables	Level		Difference First		Decisions	
	ADF	PP	ADF	PP	ADF	PP
D(EIB)	-2.121201	-1.984678	-7.288555	-8.436108	I(1)	I(1)
D(TEC)	0.045727	0.202471	-6.237560	-6.239706	I(1)	I(1)
D(TIF)	-4.598059	-4.586431	-6.644945	-9.792392	I(1)	I(1)
D(TIR)	-5.641071	-6.263155	-5.049619	-20.50982	I(1)	I(1)
D(PIBH)	-1.668262	-2.212036	-3.847565	-3.722935	I(1)	I(1)
D(APF)	-0.177472	-0.191995	-5.573335	5.573335	I(1)	I(1)

N.B. I (1) means the degree of integration of the series.

The results of the tests of stationarity ADF and PP obtained with Eviews 7, reveal that all the variables of the study are still in first difference, integrated by order 1. The degree of significance is 5%. Consequently, we can proceed to the test of cointegration to verify if these variables are cointegrated.

3.2.2. Tests of Cointegration of Johansen

Several tests (Engle-Granger test, Johansen test) are used to determine if there is or not of the cointegration between variables. In this study, we retain the test of Johansen which indicates the quantity of relation of cointegration. The results of the test are summarized in the tables below.

Table 2: Results of the Johansen cointegration test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob**
None *	0.892533	151.7057	95.75366	0.0000
At most 1 *	0.684768	80.32759	69.81889	0.0057
At most 2	0.485828	43.38526	47.85613	0.1235
At most 3	0.322879	22.09894	29.79707	0.2931
At most 4	0.256881	9.621967	15.49471	0.3109
At most 5	0.003780	0.121186	3.841466	0.7277

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values.

Table 3: Maximum Eigenvalue Test Results

Tableau 3 : Résultats du test de Maximum Eigenvalue

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob**
None *	0.892533	71.37814	40.07757	0.0000
At most 1 *	0.684768	36.94233	33.87687	0.0208
At most 2	0.485828	21.28632	27.58434	0.2593
At most 3	0.322879	12.47697	21.13162	0.5013
At most 4	0.256881	9.500781	14.26460	0.2468
At most 5	0.003780	0.121186	3.841466	0.7277

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values.

The results of the test of the trace and that of the maximum eigenvalue show that the reserved variables are cointegrated at the threshold of 5%. The no hypothesis of absence of cointegration is rejected because the test of the trace and the test of Max-eigenvalue indicate each two equations of cointegration. The existence of relation of cointegration so justifies the adoption of a model VECM.

4. Estimation and interpretation of the model VECM

4.1. Estimation

The results of the estimation of coefficients relative to the long term and the short term (equations of cointegration and speeds of adjustment) are presented in the table below. The model underwent the tests of autocorrelation of residues, of heteroskedasticity and causality.

Table 4: Long Term Model Estimation Results

Exogenous variables	Probability	Coefficients
EIB (-1)	1.000000	
TEC (-1)	-1.75E+10*	[-7.11974]
TIF (-1)	5.46E+10*	[3.45352]
TIR (-1)	7.83E+10*	[5.97155]
PIBH (-1)	3.92E+12*	[9.20804]
APF (-1)	-5.75E+10*	[-2.20856]

* indicates the significant coefficients at the 5% threshold.

Table 5: Results of short-term model estimation

Exogenous variables	Probability	Coefficients
D (EIB (-1))	-0.159625	[-1.16481]
D (EIB (-2))	0.089602	[0.67666]
D (TEC (-1))	-1.07E+10*	[-4.26867]
D (TEC (-2))	-1.66E+10*	[-7.12631]
D (TIF (-1))	8.61E+09*	[2.14384]
D (TIF (-2))	1.80E+09	[0.50214]
D (TIR (-1))	8.80E+09*	[3.38289]
D (TIR (-2))	-1.90E+09	[-0.97839]
D (PIBH (-1))	5.22E+11	[1.61026]
D (PIBH (-2))	1.57E+12*	[4.84710]
D (APF (-1))	-1.71E+10	[-1.09369]
D (APF (-2))	3.53E+10*	[2.03691]

* indicates the significant coefficients at the 5% threshold.

Table 6: Adjustment speed towards the long-term target

D(EIB)	D (TEC)	D(TIF)	D(TIR)	(PIBH)	D(APF)
(0.03898)	(5.6E-12)	(2.0E-12)	(5.0E-12)	(2.3E-14)	(5.8E-13)
[-6.02849]	[-1.78297]	[0.16300]	[-0.53975]	[-1.67675]	[-0.71690]

4.2. Interpretation and discussion of the results

4.2.1. Interpretation of the results

It emerges from results on the determinants of the long-term and short-term domestic savings, that the tests of autocorrelation and of heteroscedasticity made, suggest strongly that both models are homoscedastic and that there is no autocorrelation in the residues of the model (appendix tables 7 and 8). As for the test of causality (table 9 in appendix), the obtained results show that the terms of the exchange, the real interest rates and the gross domestic product per capita interact on the domestic savings. The financial deepening in turn, influences the inflation rate. These results so confirm those of the obtained model (tables 4 and 5).

In these results, the statistics of Fischer (F) are important. The explanatory power of these variables is estimated at 84% for the model of length and short term. These results show that the explanatory variables contribute to the explanation of the total variability. They reveal that the coefficients of determination are enough brought up. As a accordingly, the long-term and short-term models are globally satisfactory. In the short-term model, the coefficient assigned to the variable measuring the speed of adjustment (-6.02849) is statistically negative and significant at the threshold of 5% (table 6). This result confirms the existence of a long-term stable relation between the domestic savings and the explanatory variables.

So, in the long term, the analysis of the results indicates that in Congo-Brazzaville, five variables explain the domestic savings. These variables are the terms of the exchange, inflation rate, the real interest rates, the gross domestic product per capita and the financial development, moved of period. The empirical results of our study teach us that when the terms of trade increase by 1% over the studied period, any thing equals besides, it is translated by a decrease of 7.12% of the domestic savings. As regards the inflation rate, we notice that this one exercises a positive influence on the domestic savings. An increase of 1% of this rate, any equal thing besides, leads to an increase of 3.45% of the domestic savings. For the real interest rates, we observe that an increase of 1% of these rates implies an increase of the domestic savings of the order of 5.97%. On the other hand, for GDP per capita, an increase of 1% of this GDP leads an increase of the domestic savings of the order of 9.21%. As for the indicator of financial deepening, we observe that an increase of 1% of this development is translated by a reduction in the domestic savings of the order of 2.21%.

In the short term, the analysis of the coefficients shows that six variables exercise significant effects at the threshold of 5% on the domestic savings. The terms of the exchange moved by one and of two periods affect it negatively. An increase of these terms of the exchange of 1%, any thing equals besides, leads a reduction in the domestic savings of the order of 4.27% and 7.13%, respectively.

The inflation rate delayed period impacts positively on the domestic savings. An increase of this 1% rate, leads to an increase of the domestic savings of 2.14%. For the real interest rates delayed period, we notice that an increase of these 1% rates, leads to an increase of 3.38% of the internal savings. On the other hand, for the gross domestic product per capita moved of two periods, an increase of 1% of this GDP leads an increase of the domestic savings of the order of 4.85%. On the other hand, the financial deepening moved of two periods exercises positive effects on the internal savings. An increase of 1% of this development is translated by an increase of 2.04% of the internal savings.

4.2.2. Discussion of the results of the study

Over the studied period, this study shows that the terms of the exchange exercise a negative influence on the Congolese internal savings. According to the economic theory, the effects of the terms of the exchange on the domestic savings are ambiguous; they can be positive or negative. This result contradicts those of Harberger (1950), Laursen and Meltzer (1950), Ostry and Reinhart (1992), Azam (1996) and Koko Morou (2007) who show a positive relation between the terms of the exchange and the domestic savings. For the inflation rate, we notice that this one impacts positively on the domestic savings.

According to the economic theory, a variation of the inflation has two brought into conflict effects on the savings: a (positive) real effect of income or reconstruction of the cash in hand and a substitution effect or still an effect of flight in front of the currency where the savings are made less attractive (negative). In this study, the effect of real cash in hand takes it on the effect of flight in front of the currency. This result was demonstrated by Houthakker-Taylor (1970) in the United States, Deaton (1977) and Davidson and *al.*, (1979) in the United Kingdom, Howard (1978) in the big countries of the OECD and Shiba (1979) and Horioka (1986) in Japan. But also, by Gupta (1987) on a group of Asian country, Dhaneshwar and *al.*, (1995) for 39 Sub-Saharan African countries, Modigliani and Cao (2004) for China and Koko Morou (2007) for Côte d' Ivoire. This result means that the inflation contributes to the improvement of the internal savings in Congo-Brazzaville.

As regards the real interest rates, we notice that the interest rates exercise a positive influence on the internal savings. According to the economic theory, the incidence of the variations of the interest rates on the savings is debated. It presents at the same time an effect of (positive) income and a substitution effect (negative) who act opposite direction there. Within the framework of this research, these results oppose those of the substitution effects, Ouliaris (1981), Friend and Hasbrouck (1983) and Blinder (1987) in the United States which support the negative role of the interest rates on savings. But, go to the sense of the effects of income, in particular, Bulkley (1981), Koskela and Viren (1982), Gupta (1987), Dicks (1988), Balassa (1992) and Mara and Vaillancourt (2012) confirm the positive role of the interest rates on the savings. As regards Congo-Brazzaville where the effects of income dominate those substitution, this result means that an increase of the interest rates increases the present value of the future consumption. Better still, a positive variation of the real interest rates in the time generates a deterioration of the level of savings, reflecting a weakness of the effect income with regard to the substitution effects and the wealth.

This research indicates that the gross domestic product per capita moved of period and of two periods, exercises a positive and significant incidence on the domestic savings. This result seems to support the Keynesian hypothesis of the absolute income, according to which there is a positive relation between the product a head of inhabitant and the savings. Better still, it corroborates those of Friedman (1957), Modigliani (1966, 1970), Edwards (1996), Kavatiri (2005) and Koko Morou (2007) who support the hypothesis according to which a high rate of growth of the income, increases with an unchanged rate of savings in group of age. The aggregated savings improve the income aggregate by the workers with regard to those of the retired people and persons of private means. In the case of Congo-Brazzaville, this result shows the importance of the hand of work in the real domestic product. It means that any increase of the working population is beneficial in the growth.

As regards the degree of financial deepening, the observation of the results confirms in the long term, that of Pagano (1993) according to which the financial deepening reduces the rate of savings. In the case of Congo, this result suggests the erosion of the internal savings considering the growing distrust aroused by the financial system. What slows down the growth and the development of the economy of the country? In the short term, this research indicates that the degree of financial deepening exercises a positive impact on the domestic savings.

The positive effect of the degree of financial deepening was already highlighted by several empirical studies, in particular those of McKinnon and Shaw (1973), Athukorala and Sen (2004) and Koko Morou (2007) who confirm a positive relation between the financial deepening and the domestic savings. It means that in Congo-Brazzaville, in the short term, the financial deepening contributes to the development of the country.

Conclusion

The objective of this study is to analyze the determinants of the domestic savings in Congo-Brazzaville. The results obtained from the model VECM show that in the long term, the terms of the exchange, the inflation rate, the real interest rates, the gross domestic product per capita and the degree of financial deepening moved of a period, explain the domestic savings. Whereas in the short term, it is the terms of the exchange, the rate of inflation, the real interest rates delayed a period as well as terms of the exchange, the gross domestic product per capita and the degree of financial deepening delayed two periods which exercise effects on the domestic savings. It brings us to make some suggestions of economic policy. The first is relative to the negative influence of the terms of the exchange on the domestic savings. An improvement of the terms of the exchange involves that of the domestic savings. It means that public authorities have to play on this variable to stimulate the growth and thus the domestic savings.

To do it, the Congolese state has to diversify its resources, by favoring other sectors outside the oil and except the wood. The second concerns the positive effects of inflation rates on the domestic savings. According to the objectives of the monetary policy of the countries of the CEMAC, the inflation rate must be lower than 2%. In the case of Congo, this rate is upper to 2%, it thus returns to the Congolese State to set up a good monetary policy to return this rate to 2%.

The third relates to the positive incidence of the PIB per capita on the domestic savings. An increase in this GDP implies an improvement of the domestic savings. In the case of Congo-Brazzaville, this result underlies that any politics to promote the domestic savings would have limited effects if it did not come along a politics of stimulation of the growth. She could also pass by innovative projects (the digital technology, the strengthening of the investment in the human capital, the education, training, health and essential social services), thanks to a rationalization of the savings to boost the economic growth.

The fourth concerns the positive effects of the degree of financial deepening on the domestic savings. According to Levine (1997), there is financial development, when the financial instruments, the markets and the financial intermediaries reduce, the costs of obtaining of the information, the execution of contracts and the transactions. From this perspective, the Congolese public authorities have to improve the banking services and facilitate the access to financial services.

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Attachments

Table 7: Residue Test Result

Lags	LM-Stat	Prob
1	35.06744	0.5128
2	35.05613	0.5133
3	37.96551	0.3799
4	42.32048	0.2169
5	26.61691	0.8727
6	40.42574	0.2811
7	37.88039	0.3835
8	33.55490	0.5854
9	43.49892	0.1824
10	40.89096	0.2643
11	52.62963	0.0362
12	41.27523	0.2510

Probs from chi-square with 36 df.

Table 8: Heterocedasticity test results Sample: 1980 2014
Included observations :32 Joint test:

Individual components:						
Dependent	R-squared	F(26,5)	Prob.	Chi-sq(26)	Prob.	
res1*res1	0.769680	0.642649	0.7926	24.62975	0.5400	
res2*res2	0.592908	0.280086	0.9863	18.97306	0.8376	
res3*res3	0.800720	0.772706	0.7032	25.62305	0.4840	
res4*res4	0.813360	0.838062	0.6602	26.02753	0.4616	
res5*res5	0.852500	1.111473	0.5039	27.28000	0.3948	
res6*res6	0.489629	0.184492	0.9985	15.66813	0.943	
res2*res1	0.612790	0.304342	0.9803	19.60927	0.8097	
res3*res1	0.891429	1.578956	0.3239	28.52573	0.333	
res3*res2	0.857826	1.160315	0.4803	27.45043	0.386	
res4*res1	0.744397	0.560062	0.8490	23.82071	0.586	
res4*res2	0.710259	0.471415	0.9053	22.72829	0.648	
res4*res3	0.624449	0.319760	0.9757	19.98236	0.792	
res5*res1	0.738378	0.542752	0.8605	23.62810	0.597	
res5*res2	0.694280	0.436723	0.9249	22.21695	0.676	
res5*res3	0.890957	1.571279	0.3262	28.51061	0.333	
res5*res4	0.795347	0.747370	0.7204	25.45111	0.493	
res6*res1	0.758865	0.605203	0.8184	24.28368	0.559	
res6*res2	0.525746	0.213187	0.9965	16.82386	0.914	
res6*res3	0.490088	0.184831	0.9985	15.68282	0.943	
res6*res4	0.660800	0.374637	0.9553	21.14560	0.734	
res6*res5	0.759656	0.607827	0.8166	24.30899	0.558	

Table 9: Results of the Granger Causality Test

VEC Granger Causality/Block Exogeneity Wald Tests

Chi-sq	df	Prob.
546.8661	546	0.4815

Included observations: 32

Dependent variable: D(EIB)				
Excluded	Chi-sq	df	Prob.	
D(TEC)	53.18850		2	0.0000
D(TIF2)	4.713616		2	0.0947
D(TIR2)	21.88607		2	0.0000
D(PIBH)	38.98348		2	0.0000
D(APF)	4.939944		2	0.0846
All	76.60568		10	0.0000

Dependent variable: D(TIF)				
Excluded	Chi-sq	df	Prob.	
D(EIB)	2.263820		2	0.3224
D(TEC)	1.572877		2	0.4555
D(TIR2)	0.119207		2	0.9421
D(PIBH)	1.005974		2	0.6047
D(APF)	11.27702		2	0.0036
All	12.94529		10	0.2267

Dependent variable: D(TEC)			
D(EIB)	0.330485	2	0.8477
D(TIF2)	0.027483	2	0.9864
D(TIR2)	0.919856	2	0.6313
D(PIBH)	2.881431	2	0.2368
D(APF)	0.939650	2	0.6251
All	4.760316	10	0.9066

Dependent variable: D(TIR)			
D(EIB)	0.183413	2	0.9124
D(TEC)	0.193114	2	0.9080
D(TIF2)	0.278419	2	0.8700
D(PIBH)	0.384627	2	0.8250
D(APF)	2.792032	2	0.2476
All	4.947578	10	0.8947
Excluded	Chi-sq	df	Prob.

Dependent variable: D(APF)			
Excluded	Chi-sq	df	Prob.
D(EIB)	1.005320	2	0.6049
D(TEC)	1.682372	2	0.4312
D(TIF2)	0.212562	2	0.8992
D(TIR2)	1.277576	2	0.5279
D(PIBH)	1.423332	2	0.4908
All	5.572917	10	0.8498
Excluded	Chi-sq	df	Prob.

Dependent variable: D(PIBH)			
D(EI B)	2.309678	2	3151
D(T EC)	1.736733	2	4196
D(TI F2)	2.514115	2	2845
D(TI R2)	0.382676	2	8259
D(A PF)	2.945146	2	2293
Excluded	Chi-sq	df	Prob.
All	5.819450	10	0.8302