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Impact of Tax Structures on Growth in Congo, Brazzaville

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Abstract

This paper will do an empirical assessment of the impact of tax structures on economic growth. It is based on the effects of the transfers from the State to businesses and the distinction between the tax on the income of natural persons, corporate taxes and taxes on goods and services. The results obtained from the model of Dickey and Fuller show in the long term, the tax on the income of natural persons, taxes on goods and services, the total revenue of the State, transfers from the State to businesses and training gross capital fixed impact economic growth, Short term, taxes on corporations, revenue and transfers from the State to businesses are influencing this growth. In contrast to long term and short term, results show revenue and transfers from the State affect economic growth. These results helped to identify the limits of the economic policies implemented in Congo-Brazzaville.

Key words

External debt, economic growth, generalized method of moment, Sub-Saharan Africa, foreign savings

JEL Codes: F34, F35, H63, H68

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1. Introduction

Economists (Smith, 1776; Solow, 1956; Feldstein, 1974), argue that the tax structures, i.e. taxes, their level and how they are combined (OECD, 2009, 146) influence on the decisions of individuals about savings, work and the decisions of businesses to terms of production, employment, investment and innovation. Their effects on growth can be positive or negative. Many studies have shown the positive impact of tax structures on growth economic development. Corlett and Hague (1953) and Heady (1987) have for example, analyzed the impact the structure of taxes on economic growth. For these authors the structure of consumption is positively influences the Labour supply.

Tax structures, in the case of the Congo-Brazzaville based on Customs and taxes. Congolese taxation is declarative. It draws its resources from three main tax structures including: the income tax of physical persons (IRPP), taxes on the income of companies (ISS) and the value added tax (UNDP, 2012, 182). These taxes related to the State nearly 80% of tax revenues. In addition to these tax structures, there are one multitude of other taxes, such as taxes on income, taxes on property rights registration and stamp and other various tax structures of the Organization for the harmonization in Africa of the Law Affairs (OHADA).

In the light of the foregoing, the question is what were the effects of the tax structures on economic growth to the Congo Brazzaville over the period from 1980 to 2015? In this article, unlike the work of Padovano and Galli (2001), Wildmalm (2001), Johansson, (2008) and Vaillancourt and Mike (2012) that analyze the impact of the tax structure on growth, ignoring the other categories of structures tax, we will focus on the transfer of State businesses and on the distinction between taxes on personal income, corporate taxes and taxes on goods and services. We think there better understand what taxes affect positively or negatively economic growth and give ideas as to what should be a tax structure that is favorable to the development of Congo-Brazzaville.

2. Literature review

Many of the econometric models were used to study the impact of tax structures on economic growth, notably Mankiw and al., (1992), Islam (1995), Caselli et al, (1996), Barro (1996) and Widmalm (2001). These authors have used for most models in a panel. In this article we will rely on a Cobb-Douglas function to establish the relationship between the structure of taxes and economic growth. An improvement in productivity may be the result of a real policy of tax structures (STF) and reorganization of these structures based on a transfer of the tax burden of the tax to the tax on consumption, which would make the tax system more effective and favorable to economic growth (Vartia, 2008; Johansson, 2011). In Congo, this reorganization through better management of revenues of the State (RTE) and the transfer of a portion of these proceeds

to businesses (TRE). According to Grundey (2008) analysis, he conducted that outlined the development of infrastructure and the execution of sustainable development policies are one of the most vital aspects in the field of strategic planning for socio-economic development of a country.

3. Methodology of research

The data used are from the Bank of the States of Central Africa (BEAC) for taxes on the income of natural persons, corporate taxes and taxes on goods and services. Those relating to the revenue of the State, and the State to the real gross domestic product transfers come from the United Nations program for development (UNDP). Data on gross fixed capital formation and the workforce are drawn from the World Bank. The data cover the period from 1980 to 2015. We justify this choice by the unavailability of statistical data. Estimation of the model and interpretation of the results of the Estimation of the model the model estimate requires that we first study of cointegration and unit root tests. Unit root tests of unit root tests to detect the presence of unit roots in a series. In this work, we have chosen the Dickey and Fuller increased (ADF) and the test of Phillips and Perron (PP). The results of the tests are presented in the table below.

Table 1. Test of stationarity ADF and PP

Variables	level		1st difference		decisions	
	ADF	PP	ADF	PP	ADF	PP
LPIB	-0.6773	-0.6644	-5.9572	-6.4264	I(1)	I(1)
LIRP_PIB	-1.4972	-1.4566	-5.9664	-6.0117	I(1)	I(1)
LISS_PIB	-2.2932	-2.1351	-8.2048	-9.2872	I(1)	I(1)
LIBS_PIB	-0.1209	-1.1649	-7.9852	-10.059	I(1)	I(1)
LRTE_PIB	-1.1709	-1.9467	-8.2039	-9.0318	I(1)	I(1)
LTRE_PIB	-0.8891	-0.9739	-5.8918	-5.9078	I(1)	I(1)
LFBC_PIB	-2.4390	-2.4679	-6.3361	-6.3454	I(1)	I(1)
LPOA	-0.0257	0.5564	-2.8440	-3.3715	I(1)	Non

The results indicate that all variables of the study are stationary in first difference, except the POA. The level of significance is 5%. Since the variable POA is not stationary in first difference. The explained variable is real gross domestic product (GRDP), the explanatory variables are, the tax on the income of natural persons reported to GDP (IRP/GDP). They refer to the taxes levied on the net income and capital gains of individuals. Company tax reported to GDP (ISS/GDP), are taxes on the income of companies. Taxes on goods and services reported to GDP (IBS/GDP), which include all of the taxes levied on production, extraction, sale, transfer, delivery of goods, the provision of services, the use of property and authorization to use property or activities.

Total tax revenue as a percentage of GDP (RTE/GDP) indicate the share of a country's production imposed by the State in the form of taxes. Transfers from the State to businesses (TRE/GDP) show the resources that the State transfers to companies. Gross fixed capital formation (FBC/GDP) is the investment of various agents' economic residents in fixed capital. As for the active population (POA), it represents the amount of work in an economy. From this model, we can proceed to the cointegration test to check if these variables are cointegrated. Cointegration test and maximum eigenvalue test several tests (test of Engle-Granger, Johansen test...) are used to determine if there is or not the cointegration between the variables. In this study, we retain test Johansen and the own value maximum, indicating the amount of cointegration relationship. The results of these tests are summarized in the tables below.

Table 2. Results of the cointegration test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob**
None*	0.7795	150.23	125.61	0.000
At most1*	0.7753	98.819	95.754	0.030
At most2*	0.4658	48.056	69.819	0.719
At most3*	0.2600	26.738	47.856	0.864
At most4	0.2334	16.499	29.797	0.676
At most5	0.1397	7.4634	15.495	0.524
At most 6	0.0666	2.3436	3.8415	0.125

Trace test indicates 2 cointegrating Kajaani (s) at the 0.05 level * written rejection of the hypothesis at the 0.05 level

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

The Johansen test results and the own value maximum show that the variables are cointegrated at the threshold of 5%. The hypothesis of absence of cointegration, is rejected as a result of the track and the Max-eigenvalue test indicate each two equations of cointegration. It is therefore possible to identify (7-2) = 5 persistent impulses and others a source of hazards that have only a transient effect. These results suggest the existence of at least a long term relationship between the variables. The results of the estimation of long term and short term models obtained from the econometric model are presented in tables 3 and 4. Both models have suffered of heteroscedasticity and autocorrelation tests.

Table 3. Results of the estimation of the model of long-term

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.306448	0.863796	8.458538	0.0000
LIRP_PIB	-0.318674	0.104075	-3.061973	0.0047
LISS_PIB	0.008367	0.146051	0.057287	0.9547
LIBS_PIB	0.237126	0.110588	2.144225	0.0405
LRTE_PIB	0.845919	0.149347	5.664122	0.0000
LTRE_PIB	-0.431875	0.048097	-8.979218	0.0000
LFBC_PIB	-0.340655	0.102935	-3.309408	0.0025

R-squared	0.969951	Mean dependent var	7.425645
AdjustedR-squared	0.963734	S.D. dependent var	0.897463
S.E. of regression	0.170908	Akaike info criterion	-0.522712
Sum squaredresid	0.847081	Schwarz criterion	-0.214805
Log likelihood	16.40882	Hannan-Quinn criter.	-0.415244
F-statistic	156.0173	Durbin-Watson stat	1.163123
Prob(F-statistic)	0.000000		

Table 4. Estimate of the short-term model results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.0522	0.0175	2.9777	0.0061
D(LIRP_PIB)	-0.0919	0.0886	-1.0374	0.3087
D(LISS_PIB)	-0.1404	0.0701	-2.0027	0.0553
D(LIBS_PIB)	-0.0685	0.0684	-1.0008	0.3258
D(LRTE_PIB)	0.4291	0.0954	4.4973	0.0001
D(LTRE_PIB)	-0.254	0.0544	-4.7419	0.0001
D(LFBC_PIB)	-0.1149	0.0771	-1.4906	0.1476
RESID01(-1)	-0.4269	0.1169	-3.6513	0.0011

R-squared	0.7745	Mean dependent var	0.086 2
AdjustedR-squared	0.7160	S.D. dependent var	0.1729
S.E. of regression	0.0921	Akaike info criterion	-1.7335
Sum squaredresid	0.2291	Schwarz criterion	-1.3780
Log likelihood	38.336	Hannan-Quinn criter.	-1.6108
F-statistic	13.250	Durbin-Watson stat	2.0004
Prob(F-statistic)	0.0000		

3. Interpretation and discussion of results

Interpretation of results according to the results on the effects of tax structures on growth in the long and short terms, heteroscedasticity and autocorrelation tests, suggest strongly that the two models are homoscedastic and there is no autocorrelation in the tailings of the model. In these results, the statistics of Fischer (F) are important as well as probabilities associated with these are null. Also, the explanatory power of these variables is estimated to 97% for the long-term model and 77% for short term model. These results show that the explanatory variables contribute to the explanation of the total variability.

They reveal that, the coefficients of determination are high enough. As a result, long term and short term models are broadly satisfactory. In the short term model, the coefficient assigned to the variable measuring the speed of adjustment (-0.426994) is statistically significant and negative to the 5% threshold. This result confirms the existence of a stable long-term relationship between tax structures and the determinants of economic growth. Thus, long- term, the analysis of the results indicates that in Congo, five variables affect economic growth. These variables are the income tax of physical

persons, taxes on goods and services, the total revenue of the State, transfers from the State and fixed gross capital formation. They reveal that, the coefficients of determination are high enough. As a result, long term and short term models are broadly satisfactory. In the short term model, the coefficient assigned to the variable measuring the speed of adjustment (-0.426994) is statistically significant and negative to the 5% threshold. This result confirms the existence of a stable long-term relationship between tax structures and the determinants of economic growth. Thus, long- term, the analysis of the results indicates that in Congo, five variables affect economic growth. These variables are the income tax of physical persons, taxes on goods and services, the total revenue of the State, transfers from the State and fixed gross capital formation.

As for gross fixed capital formation, we observe that a 1% increase in physical capital translates into a reduction in growth of 0.34%. In the short term, the coefficients analysis shows that three variables have significant effects on the threshold of 5% on growth. Corporate taxes affect it negatively. An increase in these taxes by 1%, all things being equal, induced a decline in growth of 0.14%. The total revenue of the State affect positively the growth. An increase in these revenues by 1%, a rise of 0.42% growth. On the other hand, transfers from the State to businesses have negative effects on the growth. A 1% increase in these transfers, translates into a decline in growth in the order of 0.25%. Discussion of the results of study over the period studied, our study shows that the revenue of the State exercise a positive influence on economic growth Congolese.

This result has been highlighted by Widmalm (2001) according to which the share of government spending from the tax revenue helps improve productivity. Better yet, it reinforces the positions of Keen et al. (2010A) and Yaya Keho (2010) which confirm that in sub-Saharan Africa, the results of tax revenues are better than in rich countries, and therefore, would improve their growth. In Congo-Brazzaville, these results suggest that the increase in budgetary revenues is greater than distortions related to instruments of fundraising revenues.

This means that the State revenues are dependent on and related to oil resources, which shows that the oil has a positive impact in the growth of the Congolese economy. Long-term, this research opposes the results of Feisal and Saloua (2016) and Lakhdar, (2017). But confirms those of Tanzi and Zee (1997), Kneller, (1999), Widmalm (2001) and Johansson, (2008), according to which the progressivity of the tax on income of individuals creates a distortion in the work-leisure choice, resulting a reduction in growth. In the case of the Congo, this means that it would be better to limit the use of this lever if you want to promote growth (Ades, 2015).

Short term, this study indicates that corporate taxes have a negative impact on growth. The negative effect of taxes on growth has already been highlighted by several empirical studies, including those of Levine and Renelt (1992), Felix (2006), Bloom *et al*., (2007), Johansson, (2008), IMF (2010), Romer (2010) and Gemmel *et al*., (2011) who argue that an increase in the corporate income tax rates, discourages productivity. In the case of the Congo, this result suggests that corporate taxes do not contribute to the development of the country: made estimates, long-term, corporate taxes have no influence on economic growth.

This study also shows that contrary to what support Keller (2004), Griffith *et al.,* (2004), Criscuolo (2006), Felix (2006), Hasset and Mathur (2006) and Bloom *et al*., (2007), an increase in the rate of tax on goods and services, discourages not the productivity in the Congo or that at least, they contribute to economic growth. With regard to transfers from the State to businesses, the results oppose those Vartia (2008), OECD (2009) and Johansson (2011) which confirms that a reorganization of the tax structures based on the transfer of tax revenues are favourable to economic growth. This means that in Congo, transfers from the State to businesses are not quite well structured to allow companies to create wealth, it would be better to have the least possible remedies. With respect to gross fixed capital formation, the results show negative effects on economic growth. These results coincide with the work of the OECD (2009) and Poterba (1989) who found that physical capital as well as the decisions of investment and incentives for businesses to invest in innovative activities has consequences negative impact on productivity and economic growth. In the case of the Congo, the physical capital does not increase neither the production of companies and or the nation.

4. Conclusions

The goal of this article is to analyze the impacts of tax structures on economic growth in Congo-Brazzaville. It is based on the effects of the transfers from the State to businesses and the distinction between the tax on the income of natural persons, corporate taxes and taxes on goods and services. The results obtained from the model of Dickey and Fuller show in the long term, the tax on the income of natural persons, taxes on goods and services, the total revenue of the State, transfers from the State to businesses and training gross fixed capital, economic growth.

While in the short term, these are taxes on corporations, revenue and transfers from the State who exercise effects on economic growth. However, in the long term, taxes on goods and services, and total revenues of the State exercise a positive influence on growth. Short term, only the total revenue of the State affect positively the growth. But the observation of the results shows that the total revenue of the State positively affect economic growth in the short and long term. Furthermore, transfers from the State to businesses negatively impact growth in the short and long term. This brings us to a few suggestions of economic policy.

The first relates to the effects of taxes on the income of natural persons and the tax on economic growth. Initially an increase in these variables has a negative effect. So they seem to avoid. However they have a role in the distribution of wealth that we cannot completely ignore them. The second concerns the positive impact on growth of taxes on goods and services. An increase in taxes on goods and services increases growth. If the State wants there it, it may to some extent play on this lever. The third relates to the negative impact of the transfers from the State to the growth businesses. This result suggests that the Congolese authorities must limit these transfers, and review the details of the award to restrict them to only productive activities. As we observed, the State financial revenues have positive effects on the growth of Congolese, however the Congolese income is dependent on the export of oil. Thus, our last recommendation is the diversification of the Congolese economy. As this economy is mainly based on oil resources and wood industry, given the current turbulence on the oil market, it would be better that the Congolese State think to diversify its sources of income by promoting other areas of production, such as agriculture, wood, nascent manufacturing industry, etc.

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References

Adams, C S., Bevan, D. L. (2005). Fiscal deficits and growth in developing countries, *Journal of public economics*, 89, 571597.
Aghion, P., Howitt, P. (1988). Growth and cycles through creative destruction, Unpublished, University of Western Ontario.
Arulampalam, W., Devereux, M., Maffini, G. (2009). The direct incidence of corporate income tax on wages, Oxford university centre for business taxation, WP 09/17.
Barro, R. J. (1996). Determinants of economic growth: A cross country empirical study. NBER. Bracewell-Milnes B (1976) The camels' s back : an international comparison of tax burdens, Center for policy studies, London.
Caselli, F., Esquivel, G., Lefort, F. (1996). Reopening the convergence debate: a new look at cross- country growth empirics, *Journal of Economic Growth,* 1-40. 10.
Colm, G., Helzner, M. (1958). The structure of government revenue and expenditure in relation to the economic development of the U.S., In Brussels Congress of the I.I.F.P.
Corlett, W.J., Hague D C. (1953). Complementarity and the excess burden of taxation, Review of economic studies, n. 21.
Ebeke, C., Ehrhart, H. (2010). Tax revenue instability in Sub-Saharan Africa: Consequences and remedies, Working papers, 25, CERDI.
Engen, E. M., Skinner, J. (1996). Taxation and economic growth, *National tax Journal,* 49(4), 617-642.
Feldstein, M.S. (1974). Tax avoidance and the dead weight loss of the income tax, NBER Working Paper, 5055.
Felix, R.A. (2006). Passing the burden: Corporate tax incidence in open economics, University of Michigan.
FMI (2010). Will it hurt? The macroeconomic effects of fiscal consolidation, dans: World Economic Outlook: Recovery, Risk, and Rebalancing, 93-124.
Gemmel, N., Kneller, R., Sanz, I. (2011). The timing and persistence of fiscal policy impacts on growth: Evidence from OECD countries, Economic Journal 121 (550), 33-58.
Griffith, R., Redding, S., Simpson, H. (2004). foreign ownership and productivity: New evidence from the services sector and the R&D Lab, CEP Discussion Paper, n. 649, Centre for Economic.
Hasset K.A., Mathur A. (2006). Taxes and wages, American Entreprise Institute, Working Paper, 28.
Heady, C. (1987). A Diagrammatic approach to optimal commodity taxation, Public finance, 42.
Keen, M., Mansour, M. (2010). Revenue mobilization in sub-Saharan Africa: Challenges from globalization I-trade reform, Development policy review,28,552-571.
Kneller, R., Bleaney, M.F., Gemmell, N. (1999). Fiscal policy and growth: evidence from OECD countries, Journal of public economics, 74, 171-190.
Koester, J., Reinhard, B., Kormendi, R.C. (1989). Taxation, aggregate activity and economic growth: cross-country evidence, Journal of public economics, 80, 604-617.
Levine, R., Renelt, D. (1992). A sensitivity analysis of cross-country growth regression, American economic review, 82 (4), 942-963.

Lucas, R. (1988). On the mechanisms of economics development, Journal of monetary economics, 22, 3-42.
Mankiw, N. G., Romer, D., Weil, D. N. (1992). Contribution to the empirics of economic growth, *Quarterly Journal of economics* 107 (2), 407- 437.
Mendoza, E., Milesi-Ferretti, G., Asea, P. (1997). On the effectiveness of tax policy 26 in altering long-run growth: Harberger's super neutrality conjecture, *Journal of public economics,* 66 (1), 99-126.
Milesi-Ferretti, G. M., Roubini, N. (1998). Growth effects of income and consumption taxes, *Journal of Money, Credit and banking* 30 (4), 721-744.
Musgrave, R.A. (1969). Fiscal systems, Studies in comparative economics, New haven and London, Yale Univ. Press.
Padovano, F., Galli, E. (2001). Tax rates and economic growth in the OECD Countries (1950- 1990), Economic inquiry, January (39), 44-57.
Poterba, J.M. (1989). Capital gains tax policy towards entrepreneurship, *National tax journal*, 42.
Romer, P.M. (1986). Increasing returns and long-run growth, *Journal of political economy,* 94, 1002-1037.
Romer, C.D., Romer D.H. (2010). The macroeconomic effects of tax changes: estimates based on a new measure of fiscal shocks, American economic review, 100 (3), 763-801.
Slemrod, J. (1990). Optimal Taxation and Optimal Tax Systems, Journal of Economic Perspectives, 4 (1), 157-178.
Solow, R. (1956). A contribution to the theory of economic growth, *Quarterly journal of economics,* 65-94.
Vartia, L. (2008). Tax and economic growth, OECD Economics Department Working Papers. Young L., Gordon R H. (2004) Tax structure and economic growth*, Journal of public economics,* 89, 1027-1043.