International Journal of Development and Conflict
8(2018) 14–26

MILITARY EXPENSES: A BRAKE ON ECONOMIC GROWTH IN CHAD?

NJAMENKENGDO ARSÈNE AURÉLIEN*
Department of Economics
University of Dschang, Cameroon

KOULADOUM JEAN-CLAUDE
Department of Economics
University of Dschang, Cameroon

Abstract - The objective of this study is to assess the contribution of military expenditure on economic growth in Chad. The methodology used refers to VAR modeling over the period 1985-2015. Results show that military expenditure has a negative and significant effect on economic growth in Chad. In terms of recommendations,Chad must significantly reduce its defense budget. The country must also diversify its economy fully based on oil revenues.

Keywords: Military expenses, economic growth

JEL Classification: H56, O47

1. Introduction

For several years, the government of Chad has allocated significant parts of its budget to military and security spending. According to the CCFD-Terre solidaire report (2012), Chad's military expenditure over the period 2004-2008 increased eightfold from €53 million to €420 million, while the country ranks among the poorest in Africa and the world (186 out of 188 countries, according to the UNDP Human Development Index 2015). In addition, the defense sector is the second in terms of budget allocations, ahead of Infrastructure and Health.

According to World Bank statistics on the ranking of military spending by French-speaking countries in sub-Saharan Africa, Chad ranks first with more than 600 million USD spent on its army in 2013; far ahead of Ivory Coast and Cameroon, whose spending were respectively 453 million USD and 392 million USD. This large part of Chad's national wealth devoted to military spending raises the question of the economic impact of such expenditures.

*The authors are grateful to anonymous referee, to Professors Bruce Shearer and Maurice Catin for their comments and suggestions. They also thank KwatchoSteve and Njangang Henri for their orientations.

Corresponding author Email : arsenekengdo@yahoo.fr

The relationship between military spending and economic growth has been the subject of several empirical studies giving mixed conclusions since the work of Benoit (1973). Some authors conclude from Benoit (1973 and 1978) that military spending has a positive impact on the rate of economic growth (Arzellier and Nicolini, 2000; Malizard, 2013; Martin, 2013; Saroja and Eliyathamby, 2014; Masoud and Zaleha, 2015). But for other authors, the effect is insignificant or even negative (Berthelemy et al.1994; Dune and Mohammed 1995;Korkmaz, 2015).

These results contribute to the controversy surrounding the relationship between military spending and economic growth. The stylized facts about the Chadian economy intensify this controversy. Indeed, since the 2007 sub-prime crisis, the Chadian economy has experienced growth rates of -0.13% in 2007, +0.27% in 2008, +0.86% in 2009, -3.18% in 2011 and -1.46% in 2015. Faced with this moderate evolution of growth rates, military spending rose sharply from 4.5% of GDP in 2007 to 5.9% in 2008, 7.98% in 2009, 5.01% in 2011 and 2.02% in 2015[1].

Thus, on the basis of this theoretical and empirical controversy, taking into account the evolution of military spending and economic growth, one may question the capacity of military spending to promote economic growth in Chad. The principal aim of this paper is to assess the impact of military expenditure on economic growth in Chad.

This paper is organized as follows: After the introduction, Section 2 presents the stylized facts about military spending and the economic environment in Chad. Section 3 underscores the theoretical and empirical works. Section 4 depicts the methodology that leads to the results in Section 5. Finally, Section 6 deals with the conclusion and the economic implications.

2. STYLIZED FACTS

Republic of Chad is a landlocked country in Central Africa. It is bordered by Libya to the North, Sudan to the East, the Central Africa Republic to the South, Cameroon and Nigeria to the West. It is the fifth largest country in Africa in terms of surface area.

Chad is spending a lot of money on armaments. According to the SIPRI, in 2009, Chadian military expenditures represent 8.0% of its GDP. This puts the country ahead of the United States (4.6%), France (2.5%), Brazil (1.6%) and Great Britain (2.5%). For the entire period 1985-2015, an annual average of 2.82%of military spending is recorded. The highest value was recorded in 2009 (8%) as the country was in war with Sudan. In 2005 the lowest value was recorded (0.83). Figure 1 summarizes the evolution of military spending in Chad as a percentage of GDP.

[1]. Numbers quoted here are those of the World Development Indicators (2015). Economic growth is measured by per capita GDP growth rate.

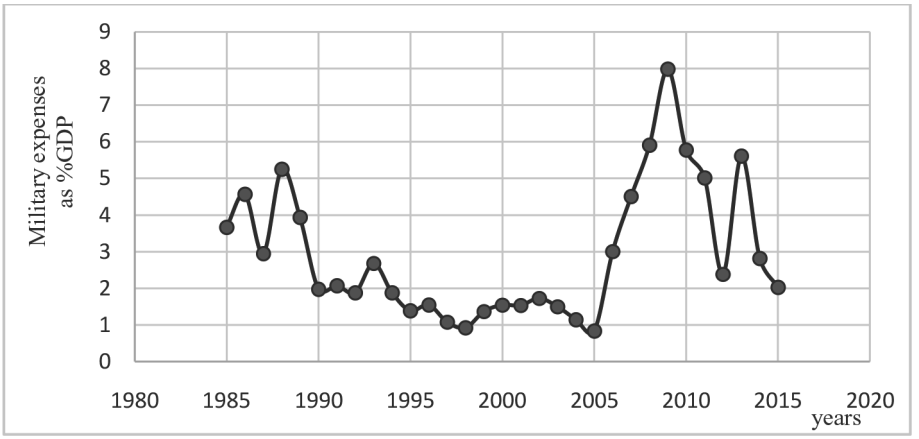

Figure 1: Military expenditure trends in Chad as %GDP

Source: authors, using SIPRI military expenditure Database (2017)

With this evolution of military spending, the spin-offs in terms of economic growth are not always felt. Indeed, the peaks of decline are very pronounced and recent growth rates are low (despite the peak of 28.71% in 2004 corresponding to the beginning of oil production), or even negative (-1.46% in 2015). This situation concerning the evolution of the growth rates in Chad is summarized in the Figure 2.

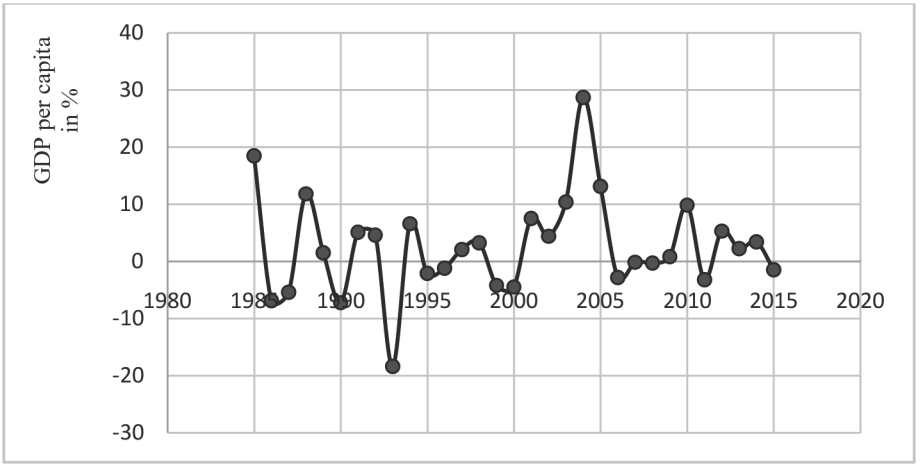

Figure 2: Trends in economic growth in Chad

Source: authors, using the World Bank database (2015)

It should be noted that these military expenditures are strongly linked to the country's oil resources. Since July 2003, the country has officially started the massive exports of its oil resources. However, the significant income from this activity has only slightly improved the living conditions of the Chadian population, as more than 50% live below the poverty line[2]. Figure 3 shows the evolution of Chad'soil revenues.

[2.] Source: CCFD-Terre solidaire report (2012).

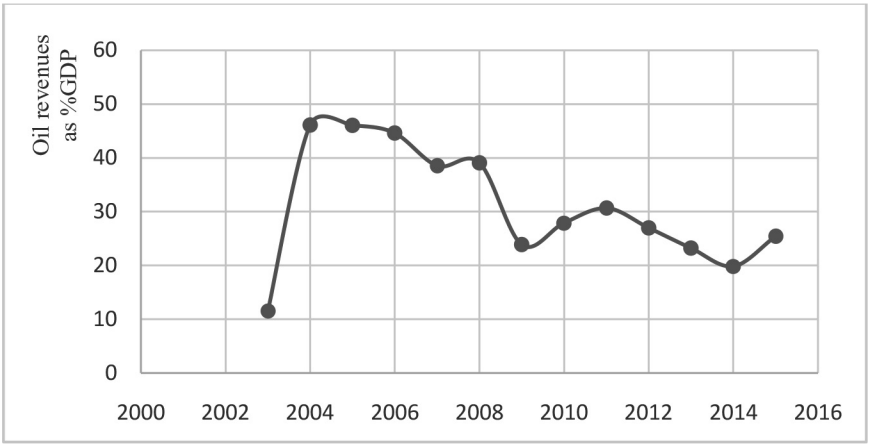

Figure 3: Evolution of oil revenues in Chad as %GDP

Source: authors, using the World Bank database (2015)

With the increase in oil revenues from 2003, the country is experiencing a period of strong economic growth. However, the trend is gradually taking shape with the financial crisis of 2008, followed by the fall in the price of oil from 2014.

The following section presents a review of the literature on military spending and economic growth.

3. Literature Review

We will hereby analyze the theoretical and empirical works between military spending and economic growth.

3.1. Review of theoretical work

Theoretical link between military spending and economic growth is summarized in the theoretical discussions between public spending and economic performance. The debate is divided between two schools of thought: the Keynesians and Neoclassical.

The first line of thought considers that public expenditure has a beneficial effect on economic growth. This assertion is part of the Keynesian logic and considers that the regulation of economic activity by the public authorities involves counter-cyclical actions. This perspective leads governments to support economic activities when it can no longer be self-regulated. So, in the short term, public spending can be used to stimulate aggregate demand and boost economic growth (Keynes, 1936). For the Keynesians, a policy of sustainable spending would help bring the national economy closer to full employment; and fiscal policy would be a powerful level of economic dynamism. By reviving the activity, the budget generates positive spill-over effects on the economy as a whole: we talk about the multiplier effect of public expenditure (Samuelson, 1992).

Therefore, in connection with our problem, the argument in favor of public spending is that the latter, in particular public investments in armaments but also in road networks,

electricity, transport, telecommunications, education and health generate externalities which improve the productivity of private factors and thus support economic growth (Malizard, 2013; Martin, 2013).

However, the second school, the neoclassical disputes the positive effect of the Keynesian multiplier and argues on the contrary that an expansionary fiscal policy does not have a favorable effect on economic activity. Negative effects arise from the fact that economic agents anticipate the future consequences of fiscal policy and adjust their consumption and savings behavior accordingly (Barro, 1990; Feldstein, 1982). In fact, the effect of public spending on growth depends on the source of financing used by the government. If this expenditure is financed by a rise in direct taxation, the net impact on growth may be negative despite a positive effect on the marginal productivity of private capital. If expenditures are financed by borrowing, then economic agents understand that today's non-taxation is a tax deferral in the future. As a result, instead of increasing their level of consumption, they save the surplus income due to today's non-taxation, to pay future taxes. This tends to reduce demand and the surplus of public expenditures is offset by the fall in private demand. In response, fiscal policy is weakening; which reduces the effects of the traditional Keynesian multiplier: this is the theory of Ricardian equivalence (Yapo, 2002).

The macroeconomic analysis of military spending has not attracted the enthusiasm of economists[3]. Aben (1992) shows that if the impact of military expenditures on economic activities is feasible, they do not have a decisive contribution and hence, do not appear to be a good vector of economic policy. According to Aben (op cit), the problem of the efficiency of military expenditures on the Economy stems from the multiplicity of channels by which these expenditures affect economic activity. Thus, according to Dunne et al. (2005), three channels can be considered.

First, the demand channel, based on the Keynesian theory, highlighting the positive effect of military spending on the macroeconomic environment through the multiplier effect illustrates the negative effect of military spending on private investment; which raises the interest rate.

Next is the supply channel. Here, the factors of production are in competition between civil and defense uses: it is the dilemma "guns-butter" illustrated by this quote of Dwight Eisenhower (1953): "*Every gun that is made, every warship launched, every rocket fired signifies, in the final sense, a theft from those who hunger and are not fed, those who are cold and are not clothed*". Nevertheless, we note positive spill-over effects such as the effects of technological spill-over (indirect spill-over effects) in the nuclear or aeronautical sectors, which are beneficial for the economic sphere (nuclear power plant, more efficient airliners).

Finally, we have the channel of security. It is widely accepted that military expenditures satisfy a need for security, a condition for a stable business climate. By analogy, an increase in military spending may be perceived as a sign of an imminent threat, delaying the process of growth.

---

3. Malizard (2013) nonetheless points out that the industrial aspects and the application of the public economy to the field of defense have received particular attention.

In short, there are two contradictory effects for each of the channels. Military spending certainly has a positive effect on economic activity (Keynesian thesis), but there would be a threshold beyond which these expenditures would jeopardize economic growth. The following section lists some empirical works related to our problem.

3.2. Review of empirical works

Several empirical studies have highlighted the effect of military spending on economic growth. Some of these studies tried to show the positive effect of military spending on growth, but for others the effect is rather negative or even insignificant.

On the one hand, Arzellier and Nicolini (2000) analyzed the effects of military eviction on the civilian sector. They have specified cases where spill-over effects from the military sector are sources of economic growth and have shown that the growth of a region is more driven by inter-sectoral and inter-regional spill-over effects.

Saroja and Eliyathamby (2014) specify the existence of a positive causal relationship between military spending and growth in Sri Lanka over the period 1975-2013. Indeed, the country has faced more than thirty years of civil war until 2009. According to the authors, investment in armaments in this framework was a way to redress the political situation of the country, in order to attract new foreign investors.

Going further, Jiang and Zhonghou (2014) on a study on China, show that the impact of military spending on growth is mixed and depends on the period of study. Over the period 1952-1978, the increase in military spending positively and significantly affected growth. Over the period 1978-2009, the effect of these expenditures on growth is rather negative and significant. But on a long-term study (1952-2009), the increase in military expenditure negatively affects growth.

Masoud and Zaleha (2015) in an analysis of a sample of 67 developed countries over the period 2002-2010 conclude that there is a positive and significant relationship between military spending and economic growth. In this context, investment in armaments appears as a strong signal that reinforces the position of investors.

On the other hand, Berthelemy et al. (1994) in a study of OECD countries show that for most developing countries, the decline in public armaments expenditure since the mid-1980s is dictated by financial constraints, by a radical change in political behavior towards military and security issues.

Dune and Mohammed (1995) show that, in a sample of 13 sub-Saharan African countries over the period 1967-1985, military spending negatively and significantly affects the economy due to the accumulation of human capital, the decline in productive investment and the balance of payments deficit.

Kollias et al. (2004) on a study of 15 European Union countries and on the basis of Granger causality test show that sustainable economic growth leads to an increase in military spending, but the opposite is not verified. Thus the effect of military spending on growth turns out to be negative.

Following the same line of reasoning, but this time on a sample of 10 countries in the Mediterranean over the period 2005-2012, Korkmaz (2015) shows that military spending negatively affects economic growth and increases unemployment.

We are therefore faced with an empirical controversy. In developed countries, military spending appears to be a factor of economic growth, but in developing countries, the opposite is true. In the next section, we will examine the specific case of the Chadian economy.

4. Methodology Of Analysis

This section aims at presenting the methodology used to conduct our econometric approach.

4.1. Nature and data source

The study focuses on Chad. The data used come from secondary sources obtained from the World Bank database (2015) and SIPRI Military Expenditure Database (2017) over a period of 1985 to 2015. We use the method of multiple imputation to fill missing data (Rubin, 1987; Njamen and Kwatcho, 2016). Estimates are made using the Stat a software.

4.2. Estimation Method and Econometric Specification

The method used refers to VAR modeling. This methodological choice is usedto determine the effectiveness of military spending on economic growth. The VAR specification retained by Sims (1980) is based on the idea that if the values of make it possible to explain the present values of , we can deduce that is the cause of .Theoretically, we consider a VAR(p) process with two variables. The model is as follows (Gossé and Guillaumin, 2011).

$$Y_{1,t} = a_1^0 + \sum_{i=1}^{p} a_{1,i}^1 Y_{1,t-i} + \sum_{i=1}^{p} a_{1,i}^2 Y_{2,t-i} + \sum_{i=1}^{p} b_i^2 Y_{1,t-i} + \varepsilon_{1,t} \quad (1)$$

$$Y_{2,t} = a_2^0 + \sum_{i=1}^{p} a_{2,i}^1 Y_{1,t-i} + \sum_{i=1}^{p} a_{2,i}^2 Y_{2,t-i} + \sum_{i=1}^{p} b_i^1 Y_{1,t-i} + \varepsilon_{1,t} \quad (2)$$

In the VAR specification, we take into account the number of delays induced by the unit root test. Thus, the choice of the maximum number of delays likely to bring information to the estimation of the model is based on the interpretation of the different information criteria. The optimal delay is the one which minimizes the Akaiike Information Criteria (AIC), Hannan-Quinn (HQIC) or Schwartz (SIC).

Thus, $y_t = (y_{1t}, y_{2t}, \ldots, y_{kt})$ obeys an auto regressive process Vector of order p if one has:

$$y_t = c + \phi_1 y_{t-1} + \phi_2 y_{t-2} + \ldots + \phi_p y_{t-p} + \int_t \quad (3)$$

This simple structure makes it possible to construct a number of tools that have been proven useful, in particular, for the construction of predictions and the study of dynamic relationships between variables (Colletaz, 2017).

The empirical model adopted is inspired by that of Benedict et al. (2005) on the modeling of economic growth. For these authors, the determinants of growth are : real GDP per capita lagged by a period (representative of the level of economic development), population growth rate, gross investment rate as % of GDP, Secondary school enrollment rate, changes in terms of trade (representative of external shocks), fiscal balance as % of GDP, and trade openness.

However, given the availability of data and taking into account Chad's economic environment, we take as explanatory variables: military expenditure as % of GDP (Milexp), oil revenues as% GDP (Oilrents), Human capital represented by the primary school enrollment rate (Khu), annual population growth rate (Txpop), an indicator of official development assistance for all donors in logarithm (Apd) and trade openness (Open). The expected signs for the various variables of the model are confined in Table 1.

Table 1: Expected Signs of Different Variables

Variables	Expected Signs	Justifications
Tcroist-1	+	Barro (1990).
Milexp	-	Korkmaz (2015)
Oilrents	+	Omraniand Toumache (2016)
Khu	+	Nembot et al (2013)
Txpop	+/-	Benedict et al. (2005)
Apd	+	Tafah et al (2012)
Open	+	Benedict et al. (2005)

Source: authors starting from a review of the literature

5. Results

We briefly present the results of the preliminary tests and the actual estimate.

The unit root test (ADF), in table 2, shows that all variables are stationary at level [I(0)], except for Tcrois, integrated first order [I(1)].

Table 2: Unit root test

Augmented Dickey-Fuller test for unit root (ADF)					
Variables	At level		In difference		Decision
	Pvalue	Statistic	Pvalue	statistic	
Tcrois	0.1826	-0.920	0.0867*	-1.399	I(1)
Milexp	0.0119**	-2.385			I(0)
Oilrents	0.0002***	-4.026			I(0)
Khu	0.0882*	-1.386			I(0)
Txpop	0.0003	-3.842			I(0)
Apd	0.0110**	-2.420			I(0)
Open	0.0480**	-1.171			I(0)

Source: authors starting from Stata

*Note: *denotes statistical significance at the 10% level, ** statistical significance at the 5% level, *** statistical significance at the 1% level.*

The absence of heteroscedasticity in the model is also observed. As shown in Table 3, Prob> chi2 = 0.7295 is observed below the threshold of 5%, hence the rejection of Ho. We can conclude that heteroscedasticity is absent.

Table 3: Heteroscasticity test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of tcrois
chi2(1) = 0.15
Prob> chi2 = 0.7015

Source: authorsstartingfrom Stata

The choice of the information criterion is made according to AIC and HQIC. Table 4 shows that the information related to modeling VAR is in the delay 1. The estimation therefore relates to a linear VAR of order P = 1.

Table 4: Choice of optimal delay number

Lag	AIC	HQIC
0	12.2637	12.3671
1	**11.5116***	**11.6297***
2	11.5803	11.7132

Source: authors starting from Stata

The results of the VAR (1) estimates are presented in table 5.

Table 5: Synthesis of the results of the basic VAR model

V .A . R	Tcrois	Milexp	Oilrents	Khu	Txpop	Apd	Open
L.Tcrois	0.817	0.202	18.314	-0.072	-0.171	-0.016	-0.305
	(5.78)**	(0.19)	(3.09)**	(3.01)**	(3.72)**	(0.10)	(1.85)
L.Milexp	0.029	0.358	-0.074	0.004	-0.004	0.041	0.019
	(1.34)	(2.14)*	(0.08)	(1.18)	(0.58)	(1.62)	(0.73)
L.Oilrents	0.001	0.042	0.107	0.002	-0.003	0.001	0.003
	(0.33)	(1.36)	(0.64)	(3.02)**	(2.32)*	(0.32)	(0.72)
L.Khu	-0.253	1.207	-86.627	1.131	0.541	-0.936	2.103
	(0.33)	(0.20)	(2.68)**	(8.65)**	(2.16)*	(1.05)	(2.34)*
L.Txpop	0.027	-3.518	34.015	-0.047	0.685	0.245	0.104
	(0.10)	(1.75)	(3.08)**	(1.04)	(7.98)**	(0.80)	(0.34)
L.Apd	-0.022	0.250	-6.435	0.017	0.095	0.931	0.116
	(0.38)	(0.55)	(3.60)**	(1.67)	(4.94)**	(13.57)**	(1.69)
L.Open	0.402	1.531	-5.397	0.030	0.010	0.276	0.414
	(2.71)*	(1.35)	(0.87)	(1.20)	(0.20)	(1.60)	(2.40)*
P>chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
No. of obs = 30							
Sample: 1985 - 2015							

Source: authorsstartingfrom Stata
*Note: *denotes statistical significance at the 10% level, ** statistical significance at the 5% level. Numbers in brackets represent the values associated to the statistic of the normal distribution.*

The above results show that the model is well specified. We observe the probability P > chi2 which is significant at 1%. This basic form of VAR modeling presents the

defect of only showing the interdependence between the variables of the model, given the number of delay according to Akaiike Information Criteria (AIC), Hannan-Quinn (HQIC) or Schwartz (SIC). In this case, it is for us to show the effect of military expenditure on economic growth. Thus, we consider the explanatory variables as entirely exogenous; which gives the following results in table 6.

Table 6: Synthesis of the results of the VAR model

	Tcrois
L.Tcrois	0.6430 ***
	(0.000)
Milexp	-0.01832 **
	(0.076)
Oilrents	0.00513
	(0.134)
Khu	1.3570 **
	(0.017)
Txpop	-0.6336***
	(0.009)
Apd	0.1218 **
	(0.018)
Open	0.2726 **
	(0.050)

Source: authorsstartingfrom Stata
*Note:** denotes statistical significance at the 5% level, *** statistical significance at the 1% level.* The probability values are in brackets

We perform two post-estimation tests to ensure the robustness of the results obtained: one to ensure that the residuals are not auto-correlated and the other to verify the stability of the VAR (1) model.

Table 7: Post-estimate Tests

Lagrange-multiplier test of Johansen (1995)	**Eigenvaluestability condition**
chi2 = 2.2866 prob> chi2 = 0.13050 H0 : no autocorrelation at lag 1	Eigenvalue = 0.6430855 Modulus = 0.643085

Source: authorsstartingfrom Stata

As shown in the table 7 above, these two tests reveal the absence of autocorrelation (Prob> chi2 is greater than 5%) and the proof of the stability of the VAR model. Lutkepohl (2005) and Hamilton (1994), both, show that if the modulus of each eigenvalue is strictly less than one, the estimated VAR is stable. Thus, we can make the following comments about the model variables.

The coefficient of the variable Tcrois, delayed by a period has a positive and significant effect at 1% on the current level of growth. This result is consistent with what was expected and is consistent with the convergence principle of Barro's growth models (1990).

Military spending has a negative and significant effect at 5% on economic growth. This result corresponds to what was expected and in line with the one obtained by Korkmaz (2015), given the size of the defense budget in Chad.

Oil revenues have a positive but non-significant impact on growth. The reason for this would be the fall in the export price of crude oil, which contributes to the fall in revenues.

The primary school enrollment rate significantly (at 5%) contributes to economic growth in Chad. This result is in agreement with the oneobtained by Hugon (2005), Nembotet al. (2013), which highlights the positive effect of knowledge dissemination on the level of productivity of the economy.

The estimated coefficient of the population growth rate has a negative and significant sign at 1%, which is consistent with the results obtained by Benedict et al. (2005). In this context, demographic pressure undermines growth in Chad.

The coefficient of official development assistance has a positive and significant sign at 5%. This result is consistent with that obtained by Tafah et al. (2012). Thus, an increase in government aid of one unit leads to the same change in growth of 0.12 units.

Trade openness has a positive and significant effect at 5% on growth. This result is in agreement with that obtained by Benedict et al. (2005) which suggest that the opening up of the economy is beneficial for economic growth.

6. Conclusion

This study allowed us to analyze the effect of military spending on economic growth in Chad. The results reveal that military spending negatively and significantly affects Chad's economic growth. There is therefore a negative linear relationship between military spending and economic growth in Chad.

The recommendations relate to the reduction of the budget for the defense sector. It is essential to place special emphasis on the hazards that could jeopardize growth efforts. First, the security situation remains a concern, particularly at the border with Nigeria and Cameroon. If the situations were to increase, this would have a considerable impact on trade and investment decisions. Secondly, there is a need for a recovery in public finances, which implies a fall in government expenditure as well as an increase in revenue. But this must be done with caution in order to control inflation. It is also necessary to increase the diversification of the economy so that it is no longer heavily dependent on oil revenues, given the decline in oil prices.

References

Aben, J. 1992. *Economie politique de la défense*. Editions Cujas : Paris.

Arzelier, M..P., and V.Nicolini. 2000. "L'impact d'une variation des dépenses militaires sur les économies régionales et nationale". *Région et Développement*, no. 11 : 83-118.

Barro, R. J. 1990. "Government Spending in a Simple Model of Endogeneous Growth". *Journal of Political Economy* 98(5):103-125.

Benedict, C., Bhattacharya, R. and Q.N.Toan.2005. "l'Allégement de la dette peut-il doper la croissance des pays pauvres ?". *dossier économique du FMI*,no.34: 5-9.

Benoit, E. 1973. *Defence and Economic Growth in Developing Countries*. Boston, MA: Lexington Books.

Benoit, E. 1978. "Growth and Defence in Developing Countries."*Economic Development and Cultural Change* 26(2): 271-280.

Berthelemy, J. C., Robert, S. and S. Sen.1994. "Les dividendes du désarmement : défis pour la politique de développement." *Cahier de Politique Economique n°8*, Centre de Développement de l'OCDE.

CCFD-Terre solidaire. 2012. *Le développement piégé : les transferts d'armes et le développement au Tchad (2005-2010)*. Ce rapport écrit par Zobel Behalal et Solene Margerit en collaboration avec le Comité de Suivi de l'Appel à la Paix et à la réconciliation Nationale au Tchad (CSAPR) et la Ligue tchadienne des droits de l'homme (LTDH).

Colletaz, G. 2017. "Les processus VAR." Cours de séries temporelles multivariées - Semestre 2 - Master ESA. *https://www.univ-orleans.fr/deg/masters/ESA*

Dune, J. P., and N. A. Mohammed.1995. "Military spending in sub-Saharan Africa: Some evidence for 1967-85." *Journal of Peace Research* 32(3): 331-343.

Dunne, J. P., Smith, R and D. WIillenbockel.2005. "Models of military expenditure and growth : A critical review." *Defence and Peace Economics* 16: 449-460.

Eisenhower, D. 1953.Speech to the American Society of Newspaper Editors. Washington D.C. April 16, 1953.

Feldstein, M. 1982. "Government deficits and aggregate demand." *Journal of Monetary Economics* 9(1): 01-20.

Gossé, J. B., and C. Guillaumin.2011. "Christopher A. Sims et la representation VAR", archives-ouvertes, <hal-00642920>.https://hal.archives-ouvertes.fr/hal00642920/document.

Hamilton, J. D. 1994. *Time series analysis*. Princeton University Press.

Hugon, P. 2005. "La scolarisation et l'éducation : facteurs de croissance ou catalyseurs du développement ?" *Mondes en Développement* 132: 13-28.

Jiang, Y., and G. Zhonghou.2014. "An empirical research on the relationship between defense spending and aggregate output of China." *Review of the Air Force Academy* 25(1): 5-10.

Keynes, J. M. 1936. *Théorie générale de l'emploi, de l'intérêt et de la monnaie, Livres I, II et III*. Translated and edited by Jean- de Largentaye (1942). Éditions Payot : Paris.

Kollias, C., Manolas, G and S. M. Paleologou.2004. "Defence expenditure and economic growth in the European Union: A causality analysis." *Journal of Policy Modeling* 26(5): 553-569.

Korkmaz, S. 2015. "The Effect of Military Spending on Economic Growth and Unemployment in Mediterranean Countries." *International Journal of Economics and Financial Issues* 5(1): 273-280.

Lutkepohl, H. 2005. "Structural Vector Autoregressive Analysis for Cointegrated Variables."*Working paper ECO no. 2*, European University Institute.

Malizard, J. 2013. "Dépenses de défense et activité économiques: quelles influences ?" *Les Cahiers de la Revue Défense Nationale*: 75-80.

Martin, O. 2013. "L'efficacité économique de la dépense de défense." *Les Cahiers de la Revue Defense Nationale*: 81-86.

Masoud, A.K., and M. N. Zaleha.2015. "Military Expenditure and Economic Growth in Developing Countries: Evidence from System GMM Estimates."*Journal of Emerging Trends in Economics and Management Sciences* 6(1): 31-39.

Nembot, D.L., Kamdem, D. and , N. R. Tsafack. 2013. "Foreign direct investments and economic growth in sub-saharan african countries: A comparative analysis between landlocked countries and countries having access to the sea."*International Journal of Economics and Finance* 5(6): 157-169.

Njamen, K.A.A. and, K.S. Kwatcho.2016.“Gestion des données manquantes dans les bases de données en sciences sociales: algorithme NIPALS ou imputation multiple ?” *European Scientific Journal* 12(35): 388-400.

Omrani, T and R. Toumache. 2016. “L’impact de la chute des prix du pétrole sur le financement de l’economie algereienne.” *Revue ElWahat pour les Recherches et les Etudes* 9(2): 755-768.

Samuelson, A. 1992.*Les grands courants de la pensée économique*. Presses universitaires de Grenoble : 5e édition.

Saroja, S., and S. **Eliyathamby.** 2014. “Defence expenditure and economic growth: A case study of sri lanka using causality analysis.”*International Journal of Development and Conflict*4: 69-76.

Sims, C. A. 1980. “Macroeconomics and Reality.”*Econometrica* 48: 1-48.

Sims, C. A. 1996. “Macroeconomics and Methodology.”*Journal of Economic Perspectives* 10(1): 105-120.

SIPRI. 2017. *SIPRI Military Expenditure Database*. www.sipri.org.

Tafah, E. E., Nembot, N. L. and K. A. Djampou.2012. “Endettement extérieur et performances économiques du Cameroun.”*Revue Camerounaise d’Economie et de Management* 1(4): 91-109.

WDI. 2015. *World Development Indicators Data*. www.worldbank.org/data.

Yapo, L. 2002. “Déterminants de l’endettement extérieur des PPTE.” *World Institute for Development Economics Research*. Discussion paper n° 2002/14.