

Debt and Growth in West African Economic and Monetary Union Countries (WAEMU): The Role of Institutional Quality

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Abstract

This paper examines the role of institutional quality in the relationship between debt and growth in the West African Economic and Monetary Union (WAEMU) over the period 1980-2019. We used a combination of models. The model of Hansen (1999) and the models of Brambor et al., (2006) and that of Esarey & Sumner (2018). The results of the direct relationship between debt and growth indicate a debt threshold of 54.50% of GDP. The results also show that, below this threshold, debt has a positive effect on growth, but, above that threshold, the effect is negative. The results also show that taking into account the quality of institutions in the relationship between debt and growth has a positive and significant net effect on growth. This result highlights the important and essential role of the quality of institutions in debt management.

Keywords

Debt, Institutions, Economic Growth, Threshold

1. Introduction

The post-colonial macroeconomic situation in most sub-Saharan African countries seemed to be a poor motivation for their economic take-off. It increased the weight of macroeconomic imbalances and undermined all initiatives for growth and inclusive development. See Ali & Son (2007); Asongu & Nwachukwu (2016); Barcola & Kevalo (2018). To compensate for these deleterious macroeconomic outcomes, these countries have put in place policies to diversify trading partners and development strategies to reorient development policies inherited from colonization and mitigate the impact of the economic crisis, Kasekende et al., (2010).

The use of debt to stabilize and revive the economy, [Krugman \(2012\)](#); [Campbell et al., \(2018\)](#) is becoming crucial for many developing countries including those in the WAEMU.

However, poor debt management and budgetary indiscipline did not achieve the expected results of this massive debt, which led to unsustainable debt levels, [Daniel & Shiamptanis \(2012\)](#). Misappropriation of public funds; poor quality of debt resource management institutions; financing of non-income generating projects; higher interest rates demanded by the markets; crowding-out effects having a negative impact on productivity; planned tax increases and inflation are contributing factors to the debt crisis and slower growth, [Cochrane \(2011\)](#); [Aghion & Kharroubi \(2008\)](#). To reduce the negative effect of debt on growth, demands have led international institutions and private creditors to tighten borrowing conditions. Among the measures, good governance and the establishment of quality institutions are considered to be primary criteria to help these countries remedy weaknesses in debt management and promote transparency, [Billet et al., \(2007\)](#); [El Ghouli et al., \(2017\)](#).

Despite the excessive weight of debt and its perverse effects on the economy, debt has helped generate income in the economies, [Chiu & Lee \(2017\)](#); [Owusu-Nantwi & Erickson \(2017\)](#) but research results state that good institutional quality contributes to undermining the negative effects of economic vulnerability on growth, [Balavac & Pugh \(2016\)](#); [Cadoret et al., \(2014\)](#). This observation reinforces the crucial role of institutional quality on growth, [Daud & Podivinsky \(2014\)](#). From the above, the role of quality institutions could be crucial and now, institutions are considered in the debate on the relationship between debt and growth, [Cadoret et al., \(2014\)](#); [Bernardo et al., \(2018\)](#); [Kourtellos et al., \(2013\)](#).

As far as we are concerned, at the level of the WAEMU space, most of the articles that have contributed to the debate on the relationship between debt and growth have focused solely, on the one hand, on the study of the non-linearity relationship between debt and growth and, on the other hand, on analysing the sense of causality between debt and growth. Our study differs from the previous ones as, beyond the classical analyses, this paper integrates the institutional approach in debt management to analyze its effect on growth. The objective of this paper is to analyze the role of institutional quality in the relationship between debt and economic growth in WAEMU countries. Specifically, the aim is to determine a debt threshold beyond which marginal debt has a negative effect on growth and, secondly, to examine the effect of debt on growth conditioned by the quality of institutions. The rest of this article is structured as follows. Section 2 presents the literature. Section 3 identifies the data sources and describes the study variables. Section 4 presents the methodology. Finally, Section 5 presents the results, their interpretations and a discussion of the main conclusions.

2. Literature Review

This section provides a brief overview of what theory and empirical studies say

about the relationship between debt and growth. Currents of thought have turned their attention to the theoretical debate on the relationship between debt and growth. We focus on two main currents of thought, namely the Keynesian theory, the classical theory and the neo-classical theory. The Keynesian theory regarding the relationship between debt and growth intervenes in an underemployment economy and considers that the impact of debt on growth is considered positive in the short term. For Keynesians, debt does not cause any burden for either future or current generations because of the investments it generates. However, according to the classical view of public debt, [Elmendorf & Mankiw \(1999\)](#) in the short term, output is determined by demand and public deficits (or higher debts) have been offset by a positive effect on disposable income, aggregate demand and aggregate output. This positive short-term effect of budget deficits (and higher debt) is likely to be significant when output is really below average. The negative effect of public debt could be much larger if high debt increases uncertainty or raises hopes of future confiscation, possibly through inflation and finance.

Higher debt could have a negative effect even in the short term. The conventional view between the short- and long-term effects of debt ignores the fact that prolonged economic recessions can reduce future potential output (because they increase the number of discouraged workers, leading to a loss of skills and having a negative effect on organizational capital and investment in new activities). In this case, current budget deficits (and rising indebtedness) can have a positive effect on output in the short and long run.

The neo-classicals do a different analysis than the Keynesians and the classics. Inspired by Ricardo, [Barro \(1989\)](#) helped to refute this thesis of the efficiency of budgetary action by the Ricardian equivalence principle, because for him, private agents integrate the State's intertemporal budgetary constraint into their calculation. For this follower of the new classical school, by reducing public expenditure today, the State creates the conditions for a subsequent reduction in the tax rate and vice versa in the event of an increase in expenditure. Anticipated by agents, budgetary policy will therefore have zero effects. In this case, therefore, there is an increase in private savings while public savings decline, so that the expansionary fiscal policy has no effect on the economy. If this policy is financed by borrowing, the government will therefore later levy taxes to repay the debt; rational agents, therefore, will save instead of increasing their consumption, thus making fiscal policy zero and therefore inefficient.

Although transaction costs are the starting point for institutional theory, [Coase \(1937\)](#); [North \(1990\)](#) work on the primacy of institutions in the development process gave new impetus to the relationship between institutions and growth. The theoretical contribution of institutions to the relationship between debt and growth is based on the theoretical foundations of the neoclassical approach to institutions, [Alchian \(1965\)](#); [Eberhardt \(2019\)](#); [Karadam \(2018\)](#). However, towards the end of the 1980s, international institutions put in place an institution-

al theoretical framework aimed at improving the efficiency of the State in the management of public affairs. This framework consisted of integrating institutional approaches such as good governance, taking into account specific institutional variables such as corruption, religion in politics, political stability, democracy, etc. in order to establish the relationship between debt and economic growth in developing economies.

Several empirical works conclude with contradictory results that the relationship between debt and growth is non-linear and characterized by the presence or absence of a threshold above which debt begins to have a negative effect on economic growth. While non-linearity and threshold effects could result from the presence of over-indebtedness [Krugman \(2012\)](#) develop a theoretical model whereby debt can only be contracted to finance public investment and the optimal level of debt is determined by the public/private capital ratio that maximises growth. These results show that the level of debt that maximizes growth is a function of the elasticity of production of the capital stock.

In a recent contribution, [Agbekponou & Kebalo \(2019\)](#) used the approach of [Hansen \(1999\)](#) and ECOWAS central government debt data over the period 2007-2016 to analyse the effect of debt on growth in ECOWAS. The results showed a debt threshold estimated at 30.71% of GDP, below which additional debt has a positive effect on growth. On the other hand, above 30.71% of GDP, central government debt has a negative effect on growth.

In recent years, studies on the debt/growth relationship have been added to the existing literature. One of these recent studies is that of [Brida et al., \(2017\)](#). Using a nonparametric approach based on data from 16 countries from 1977 to 2015, the study shows a negative relationship between debt and growth, in line with most previous publications such as the results of [Panizza & Presbitero \(2014\)](#). During the period studied, growth seems to be driven by debt levels relative to GDP, in particular around the 90% threshold of the debt/GDP ratio. Conversely, using a dynamic panel data model, [Chudik et al., \(2017\)](#) there is no common debt threshold for the countries observed. Likewise, observing data from 40 countries over a 45-year period provides no evidence of a universally applicable threshold effect in the relationship between debt and growth. However, regardless of the threshold, the authors note significant negative effects of the accumulation of debt on growth.

Recent studies have also stressed that country coverage is important for the threshold effect. [Karadam \(2018\)](#) studies threshold effects in the debt-growth relationship for different types of debt covering a large data set of 134 countries from 1970 to 2012. She finds that the non-linearity of the debt-growth relationship depends mainly on the debt structure. She concludes that the impact of debt on growth gradually shifts from positive to negative after a certain threshold has been reached [Pescatori et al., \(2014\)](#). While the negative effects on growth appear at a debt-to-GDP ratio of 106.6% for the whole sample, for developing countries these effects occur at a much lower level, namely 88% of debt to GDP.

In recent years, some studies on the effects of debt on growth have found no evidence of a causal relationship between debt and growth. [Jacobs et al., \(2020\)](#) study the causal link between debt-to-GDP ratios and growth rates for 31 EU and OECD countries. They find no causal link between debt and growth like, [Panizza & Presbitero \(2014\)](#) do, regardless of debt levels relative to GDP. In addition, he finds a causal relationship between growth and debt, suggesting that the negative effects of growth increase the level of debt by inflating real long-term interest rates. A second study, which corroborates the findings of [Jacobs et al., \(2020\)](#) was conducted by [Égert \(2015\)](#). He uses time-series data from 27 countries and finds no evidence of a long-term relationship between debt and growth.

The final study on the relationship between debt and growth may provide the most data-rich analysis. [Swamy \(2019\)](#) uses the World Bank and the IMF data from 252 countries from 1960 to 2009 to observe the causal relationship between debt and growth. The results show a negative relationship between debt and growth. Furthermore, a 10% increase in the debt-to-GDP ratio is associated with a 0.23% reduction in average growth. Also, he finds a threshold around 110 % of GDP, countries with ratios between 91 - 150 showing a downward trend in growth and countries with ratios of 151 or more showing a more pronounced downward trend.

Responding to the results of the study of the causality between debt and growth made by [Lof & Malinen \(2014\)](#); [Panizza & Presbitero \(2014\)](#) indicate that there is a negative correlation between debt and growth but their results show that when debt increases, growth tends to decrease as the results of [Checherita-Westphal & Rother \(2010\)](#). For debt levels below 60%, debt tends to have a positive effect on growth, while debt levels between 61% and 90% do not have a significant impact on growth and debt levels above 90% have increasingly negative effects on growth rates. This result corroborates that of [Reinhart & Rogoff \(2010\)](#).

Some years later, [Herndon et al., \(2013\)](#) have highlighted a certain number of faults in the calculations of the threshold of the works about the link between the debt and the growth; namely, that by [Reinhart & Rogoff \(2010\)](#) and have indicated that the growth did not decrease below 90% in the whole data by [Reinhart & Rogoff \(2010\)](#).

Nevertheless, the results of [Kourtellos et al., \(2013\)](#) showed that the debt-growth relationship can be profoundly modified by taking institutional variables into account. In a panel data study of 82 emerging and advanced economies between 1980 and 2009, the authors test the hypothesis that the effect of debt on growth is conditioned by a threshold effect, not on debt levels, but on country characteristics. The variables tested are: economic policy variables (openness to foreign trade, inflation, size of government); measures of the quality of institutions (degree of democracy, institutional constraints on decision-makers, ethnic and linguistic segmentation); geographical variables (temperate and exploitable zones); and, finally, demographic variables (life expectancy, fertility). The results obtained do not reveal a threshold effect on debt. On the other hand, the authors

do find significant threshold effects with several of the other variables tested. Among these variables, the level of democracy, considered as a measure of the quality of institutions, leads to the best results.

All other things being equal, high debt induces lower growth in countries with less democratic regimes compared to countries with higher-quality institutions (or the same level of debt no longer has a significant effect on growth). The authors argue that the quality of institutions can condition the effect of debt on growth in a number of ways. A better level of control over the allocation of borrowed resources to growth-enhancing projects (thus less crowding out); better management of debt dynamics; a favourable effect on the risk premium and more generally on the expectations of economic agents (reduction of uncertainty), which are less inclined to implement strategies of mistrust, which are unfavourable to growth.

3. Data and Sources

The data for our empirical analysis concerns the WAEMU countries over the period 1980-2019. With reference to the literature described above, data availability and the characteristics of the countries in our sample, the dependent variable of our model will be the growth rate of GDP per capita. The control variables concern the fixed capital formation rate; the degrees openness and population growth rate, and the variables debt as a percentage of GDP. These variables come from the World Development Indicators. As for the variables related to political institutions and economic institutions, they are taken from the CPIA (Country Policy and Institutional Assessment). For these two variables, a rating on a scale ranging from 1 (lowest rating) to 6 (highest rating) is assigned for each country. On this scale, a high value means very good institutional quality. We calculated an IQI institutional quality indicator which is the weighted average of the variables of political and economic institutions. **Table 1** describes and defines the variables retained for our study as well as the different data sources.

4. Methodology

This section describes the model specification. Then, presents and discusses the results. The model used is the one developed by Hansen (1999). The model specification, the non-linearity test, the procedure for estimating the debt threshold will be determined by the following Equation (1)

$$GDP_{it} = \alpha_i + \beta_1 * Debt/GDP_{it} * \Pi_{Debt/GDP_{it} \leq \lambda} + \beta_2 * Debt/GDP_{it} * \Pi_{Debt/GDP_{it} > \lambda} + \gamma X_{it} + \varepsilon_{it} \quad (1)$$

X is the vector of control variables ($X = POP, DO, IQI, FCB$), γ is the vector of parameters, $\Pi(\cdot)$ is an indicator function which takes the value 1 if the condition in brackets is met and 0 otherwise. This Equation (2) can be written as:

Table 1. Summary of variable description and data source.

Variables	Variable description	Feature	Data Sources
GDP	Cette variable capte la croissance du PIB par habitant comme variable dépendante pour tester la convergence vers un niveau de revenu réel par habitant au fil du temps.	Continuous	WDI, 2019
Eco_Inst	This variable captures all institutional actions with economic impact and their ability to support sustainable growth and reduce poverty; macroeconomic environment; working environment; investor confidence; governance cluster; financial regulation; global environment, transparency in the management of public affairs, accountability, economic freedom.	1: Weak, 6: High	CPIA, 2019
Pol_Ins	This variable captures fragile states; civil conflict; the quality of border posts; the electoral cycle; the social landscape; marginalized groups; the legal framework; democratic transition; security situation; civil wars, social unrest, ethnic tensions, pre- and post-election political violence and unpredictable changes in institutions and rules.	1: Weak, 6: High	CPIA, 2019
DO	This variable captures the external environment, measures the vulnerability of a country outside.	Continuous	
FCF	This variable translates private and public investment (in physical capital) and human capital. According to the endogenous growth model (Romer, 1986) this variable has a positive effect on the productivity of other firms due to technology transfers.	Continuous	WDI, 2019
Debt/GDP	This variable will be used to capture the vulnerability in the WAEMU countries. This indicator measures the level of debt in relation to the economic activity of a country. It is considered the most important to measure the level of debt.	Continuous	WDI, 2019
Pop_growth (annual %)	This variable is the growth rate of the total population at time t . It provides an overview of GDP per capita regarding future changes in the economy.	Continuous	WDI, 2019

Note: The data and their characteristics as well as the different sources that were used in the empirical analysis.

$$\begin{cases} GDP_{it} = \alpha_i + \beta_1 * Debt/GDP_{it} + \gamma X_{it} + \varepsilon_{it}; & \text{if, } Debt/GDP_{it} \leq \lambda \\ GDP_{it} = \alpha_i + \beta_2 * Debt/GDP_{it} + \gamma X_{it} + \varepsilon_{it}; & \text{if, } Debt/GDP_{it} > \lambda \end{cases} \quad (2)$$

GDP_{it} it represents the growth rate of gross domestic product (GDP) per capita at time t ; i is relative to the individuals represented by the WAEMU countries; t , represents the observation period; λ , is the threshold value to be estimated; α_i designates the country-specific effects which are considered as fixed effects and this assumes that all the unobservable heterogeneity between the countries of the WAEMU zone is of an additive nature; ε_{it} is the random deviation and, is assumed to be identically and independently distributed (iid) of ze-

ro mean and constant variance; $Debt/GDP_{it}$, the debt as a percentage of GDP , its square $Debt/GDP_{it}^2$, will also be introduced into the growth model to take into account the over-indebtedness thesis and to verify a Laffer-type relationship between debt and growth. X is the vector of control variables.

$$(X = POP, DO, FCF, POL_INS, ECO_INS).$$

DO_{it} is the degrees openness rate, it will allow to appreciate the dependence of WAEMU countries on the outside; FCF_{it} , the gross fixed capital formation rate which represents the total investment in relation to GDP ; POP_{it} , the population growth rate to take into account human capital in the growth process; ins_{it} , is the indicator of the quality of institutions; its presence in the growth model is relevant in the explanation of debt management as well as economic performance in developing countries. This indicator is composed of political institutions, POL_INS_{it} and economic institutions, ECO_INS_{it} . Equation (2) which reflects the positive effect that debt would have on growth before the threshold and the negative effect beyond the threshold, can be combined into a single equation with a redefinition of the interest variable, $DSGDP_{it}$.

As for: $Inf.DSGDP_{it}$ and $Sup.DSGDP_{it}$; so that at Equation (3)

$$Inf.Debt/GDP_{it} = \begin{cases} Debt/GDP_{it}, & siDebt/GDP_{it} \leq \lambda \\ 0, & OTHERWISE \end{cases} \quad (3)$$

$$Sup.Debt/GDP_{it} = \begin{cases} Debt/GDP_{it}, & siDebt/GDP_{it} \leq \lambda \\ 0, & OTHERWISE \end{cases} \quad (4)$$

Thus, Equation (4) is as follows

$$GDP_{it} = \alpha_i + \gamma X_{it} + \delta InfDebt/GDP + \varphi SupDebt/GDP + \varepsilon_{it} \quad (5)$$

δ and φ represents the marginal effects of debt on growth. Equation (5) allows us to determine the conditioned effect of institutions in the debt-growth relationship as well as different debt-to-GDP ratio thresholds. However, to determine the thresholds of institutional quality that condition the effect of debt on growth, we used estimates of Equation (6) of the following form:

$$GDP = \alpha + \beta INS + \varphi_1 Debt/GDP + \varphi_2 Debt/GDP * INS + X + \varepsilon \quad (6)$$

To analyse how the quality of institutions affects the relationship between debt and growth, the marginal effect of debt on growth is calculated as follows in Equation (7)

$$\frac{\partial GDP}{\partial DSGDP} = \varphi_1 + \varphi_2 INS \quad (7)$$

Equation (7) shows that the marginal effect of debt on growth depends on the quality of institutions. φ_2 , is expected to be positive, reflecting the fact that institutions improve the marginal effect of debt on growth. In order to analyse the existence of the effect of institutions, we only need to look at the sign of the interaction coefficient φ_2 .

If $\varphi_1\varphi_2$ are all positive (or all negative), then debt has a positive (negative) effect on growth in WAEMU countries and institutional factors favourably affect

(or aggravate) this impact.

If $\varphi_1 > 0$ and $\varphi_2 < 0$; then debt has a positive effect on growth but institutional variables reduce this positive impact.

If $\varphi_1 < 0$ and $\varphi_2 > 0$; then debt has a negative effect on economic activity and institutional conditions mitigate this negative impact. The threshold level of the institutional variable beyond which the effects of debt are felt on the level of growth is given by Equation (8) et Equation (9)

$$\frac{\partial GDP}{\partial Debt/GDP} \geq 0 \Rightarrow \varphi_1 + \varphi_2 * INS \geq 0 \quad (8)$$

Hence, the threshold level is:

$$INS^* = -\frac{\varphi_1}{\varphi_2} \quad (9)$$

5. Empirical Results

This section presents the results of the various econometric tests in our study. But, before starting the estimates, we will test for the existence of a unit root in the series. For this purpose, we use the tests of Levin et al., (2002); Im et al., (2003) and the tests of Phillips & Sul (2003). The results of these tests are presented in the **Table 2**.

Table 2 indicates that only the variables *DO* and *Debt/GDP* are stationary in difference (*i.e.* the presence of a unit root in the level series). We can move on to estimating the model identified by Equation (1), by the Hansen method. The results reported in **Table 3**.

Table 2. Stationarity.

Variables	Test	LLC	IPS	PP	Order of integration
DO	In level	0.95024 (0.8290)	0.44093 (0.6704)	13.2578 (0.5063)	I(1)
	In difference	-15.1515* (0.0000)	-13.9436* (0.0000)	154.274* (0.0000)	
Debt	In level	0.58223 (0.7198)	0.89229 (0.8139)	8.52095 (0.8605)	I(1)
	In difference	-13.1280* (0.0000)	-12.8841* (0.0000)	151.062* (0.0000)	
FCF	In level	-3.12685* (0.0009)	-3.36214* (0.0004)	48.3958* (0.0000)	I(0)
POP	In level	-4.56051* (0.0000)	-1.23358* (0.1087)	19.2046* (0.1573)	I(0)
GDP	In level	-11.7474* (0.0000)	-12.8229* (0.0000)	151.698* (0.0000)	I(0)

Notes: Values in parentheses are p-values. *means the rejection of the unit root hypothesis at the 5% threshold.

Table 3. Results without institutions.

GDP	Coef
POP	1.259*** (2.49)
FCF D1,	0.383*** (5.67)
Debt/GDP 1 (<54)	0.0304*** (2.41)
Debt/GDP 2 (>54)	-0.0224*** (-2.53)
Constant	0.0291 (2.20)
Threshold	54.50
Confidence interval	[53.71, 54.74]
Sigma_u	0.881
Sigma_e	3.694
Rho	0.0538
Nb of countries	7
Nb of observations	273

Note: ** (*) represents the significance of the coefficient at the 5% (10%) D1 threshold. Represents the symbol for differentiation in order 1. The (.) indicates the t-statistics.

The result of the Hausman specification test shown in **Table 4**.

Now, to analyze the inclusion of institutions in the debt-growth relationship, we will use Equation (10). below and vary the control variable X :

$$GDP_{it} = \alpha_i + \beta_1 * Debt/GDP_{it} * \Pi_{Debt/GDP_{it} \leq \lambda} + \beta_2 * Debt/GDP_{it} * \Pi_{Debt/GDP_{it} > \lambda} + \gamma X_{it} + \varepsilon_{it} \quad (10)$$

Interpretations and Discussion of Results

This paragraph discusses the interpretations and discussions of the main results of the different empirical tests related to the relationship between debt and growth conditioned by institutions. These results are reported in **Table 3** and **Table 5**. The **Table 3** presents the results of Hansen's method estimates for the determination of the threshold between debt and growth.

The results in **Table 3** indicate a debt-to-GDP threshold equal to 54.5%. The presence of the threshold indicates that debt has a double effect on growth. Below the threshold, debt promotes growth. The sign of the debt-to-GDP ratio above the threshold is negative and significant. Therefore, we can say that any new debt above the threshold has a negative effect and hinders growth. This result in **Table 3** is consistent with that of Patillo (2002); Kumar & Woo (2010);

Table 4. Test of Hausman.

Test: Ho: difference in coefficients not systematic						
$\chi^2(2) = (b-B)'[(V_b-V_B)^{-1}](b-B)$ $= 1.24$						
Prob > $\chi^2 = 0.5369$						
Note: Hausmann result gives a probability of 0.5369, this probability is greater than 5%, the specification of fixed effects is therefore chosen over random effects.						

Table 5. Results with institutional variables.

Variables	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
D2. DO	0.0068*** (0.00)	0.0067*** (0.000)	0.0069*** (0.000)	0.0064*** (0.000)	0.0067*** (0.000)	0.0064*** (0.000)
Debt/GDP	0.0022** (0.04)	0.0022** (0.047)	0.0022* (0.062)	0.0022** (0.024)	0.0022* (0.044)	0.0024** (0.027)
(Debt/GDP) ²	-0.0022 (0.22)	-0.0020 (0.246)	-0.0022** (0.024)	-0.0009* (0.068)	-0.0002* (0.060)	-0.0022** (0.022)
D2. FCF	6.0e-4 (0.24)	6.22e-4* (0.046)	4.99e-4* (0.072)	8.94e-4*** (0.007)	9.29e-4*** (0.008)	8.86e-4*** (0.008)
POP	0.0224** (0.027)	0.0220** (0.042)	0.0228** (0.024)	0.0092 (0.440)	0.0274 (0.222)	0.0222 (0.242)
POL_INS	-0.0282 (0.244)	-	-	-0.0042 (0.440)	-	-
ECO_INS	-	0.0082*** (0.006)	-	-	0.0047 (0.722)	-
IQI	-	-	0.0276* (0.072)	-	-	-0.0044 (0.624)
(Debt/GDP)* POL_INS	-	-	-	0.0002*** (0.002)	-	-
(Debt/GDP)* ECO_INS	-	-	-	-	0.00009** (0.024)	-
Spdpib*IQI	-	-	-	-	-	0.0002*** (0.002)
Cons	-0.0002 (0.996)	-0.0002 (0.998)	-0.0024 (0.966)	0.0042 (0.872)	-0.0222 (0.424)	-0.0090 (0.779)
F-stat	0.000	0.000	0.000	0.000	0.000	0.000

Note: Values in parentheses are p-values. ***, ** and * mean that the coefficient is statistically significant at the 1% threshold; at the 5% threshold and at the 10% threshold.

Karadam (2018) which shows the existence of an inverted U-shaped relationship between growth and the debt burden. The positive impact of debt on growth in WAEMU countries differs more or less from one country to another; however, in most of these countries, an excessive accumulation of the debt stock has a depressing effect on their growth. The negative effect of additional debt on growth is all the more important since the establishment of quality institutions (quality

institutional reforms) and a reduction in the debt burden could raise the level of growth. Good management of resources resulting from debt reduction initiatives of heavily indebted poor countries could be beneficial in stimulating growth in these countries. However, more recently, the results of [Herndon et al., \(2013\)](#) have reopened the debate on the existence or not of a single debt threshold beyond which debt could harm growth.

On the other hand, analyzing the results in [Table 5](#) which represent the results of taking institutions into account in the debt-growth relationship, that is, the results of the cross-effect of institutional variables to debt on growth, we find that the coefficients of these variables reported in columns 4, 5, and 6 are positive and significant, respectively. That is to say, the effect of the interaction of political and economic institutions as well as the institutional quality indicator and debt on growth is positive and significant. These results mean that the effect of debt on growth is conditioned by the quality of political and economic institutions in WAEMU countries. More specifically, the results in [Table 5](#) show that debt, even above the 54.5% threshold, has a positive and significant net effect on growth.

In fact, column (4) of [Table 5](#) describes the effect of the interaction of political institutions and debt on growth. We note that in the same [Table 5](#) in column (4), the results show that the coefficient of the political institution uncrossed variable to debt is insignificant. But, when the same variable is cross-tabulated with debt, its effect on growth is positive and significant. We can conclude that the consideration of the political institutional environment such as the respect of rules and laws, an efficient judicial system and a less cumbersome and corrupt administration are channels that influence debt management and reassure creditors for sustainable growth; which allowed to have this positive and significant result. Our results corroborate those of [Alesina et al., \(1996\)](#).

These channels increase the confidence that financial partners and banks have in governments. When the political environment improves, banks and donors see this as a sign of states' credibility, i.e., their ability to meet their commitments. This encourages banks and households to subscribe to government securities to crowd out government coffers for productive project financing. The establishment of political and democratic institutions, the participation of civil society and the accountability of public management have a positive and significant impact on the marginal effect of debt on growth. Efficient debt management requires a stable political environment, a less corrupt human resource base and the establishment of public debt management structures or bodies like those in industrial countries.

Column (5) of [Table 5](#) reflects the role of economic institutions in the relationship between debt and growth. The first results of this column (5) indicate that the coefficients of the economic institution variable are insignificant on GDP when they are not cross-tabulated with the debt. However, when the same economic institutions variable is cross-tabulated with the debt variable, the esti-

mates show that the effect of economic institutions and debt on economic activity in WAEMU countries is significantly positive. For a better economic outcome, these channels should allow resources to be invested in productive and income-generating projects. When economic institutions are good, debt resources invested in productive projects stimulate growth, Cadoret et al., (2014). Finally, the column (6) of **Table 5** reflects the results of the combined effect of political institutions, economic institutions and public debt on growth. In addition to taking the effect of political and economic institutions separately with debt, we calculated an index of institutional quality that takes into account both types of institutions in order to see the effect of this index and debt on growth. The results of the model estimates in the **Table 5** at column (6) indicate that the combined effect of political and economic institutions through a synthetic index of the quality of institutions and public debt has a positive and significant impact on growth in WAEMU countries. The results of the estimations presented in **Table 5** at column (4), (5) and (6) respectively indicate that institutions play a positive and significant role in the relationship between debt and growth. Our results corroborate those of Kourtellos et al., (2013).

6. Conclusion

The objective of this article was to determine the role of the quality of institutions in the relationship between debt and growth in the WAEMU. To achieve this objective, we used the Hansen threshold effect model (Hansen, 1999) as well as the marginal effects interaction models of Brambor et al., (2006) and Esarey & Sumner (2018). Our sample covered the countries of the WAEMU zone covering the period 1980 to 2019. The results reveal the existence of a debt threshold of 54.5% of GDP which corroborates those of Karadam (2018); Lee et al., (2017); Égert (2015). Below a debt level, debt has a positive effect on growth. But above this threshold, marginal debt has a negative effect on growth. This result is also consistent with Patillo (2002); Kumar & Woo (2010) who show the existence of an inverted U relationship between growth and the debt burden. This threshold is really lower than 70% of the debt/GDP ratio recommended by the criteria of the WAEMU convergence, stability, growth and solidarity pact. The negative effect of additional debt on growth could be explained, on the one hand, by the fact that the resources of the external debt are not allocated to the financing of projects generating income and value added in the short and middle term; on the other hand, corruption, embezzlement of public funds, the quality of external debt management structures and the repayment of old debts which have matured and whose interests and services have become a burden for the economy could explain thereby.

However, taking institutions into account in the relationship between debt and growth indicates that beyond the debt threshold of 54.5% of GDP, debt has a positive and significant net effect on the growth of the WAEMU. This result is consistent with those of Kourtellos et al., (2013); Cadoret et al., (2014). It shows

the importance of institutional quality in debt management for inclusive growth (see, Okoh & Ebi (2013); Ali & Son (2007). When institutions improve, economic effects have a positive impact on growth, Aubeeluck (2014).

These countries should seek to strengthen fiscal discipline and fiscal consolidation measures, as the occurrence of a strong external or internal shock could cause an increase in the level of debt; improve the efficiency of debt management by implementing a programme to strengthen the capacity of the entity in charge of debt management; maintain strong growth by moderating the pace of debt and encourage the private sector to increase investment; and reduce the budget deficit by controlling expenditure: continue efforts to control operating expenses by giving priority to structural and productive public investment expenditure and pro-poor expenditure; Increase tax revenues by broadening the tax base; Furthermore, for greater efficiency in the governance process, there should be greater accountability in public management; an adequate legal framework should be developed to regulate the exercise and role of civil society in debt management for greater transparency; civil society should be more involved in public resource management bodies in order to speed up policies to combat corruption and poverty; and a civil society charter should be drawn up setting out the powers, competences and real role in economic governance in the WAEMU. However, in order to better understand how institutions can affect the relationship between debt and growth, it would be more logical to continue the analysis by making improvements thanks to the expansion of econometric technical tools and the refinement of the methodology. Therefore, it would be imperative that future analyzes focus more on the channels through which the quality of institutions influences the effect of debt on growth.

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Conflict of Interest

On behalf of all authors, the corresponding author declares that there are no conflicts of interest.

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