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## **Effects of political institutions on the external debt-economic growth nexus in Africa**

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**Effects of political institutions on the external debt-economic growth nexus in Africa****Yann Nounamo, Simplicé A. Asongu, Henri Njangang & Sosson Tadadjeu**

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**Abstract:**

The main contribution of this study is the determination of an endogenous threshold of institutional quality, beyond which external debt would affect economic growth differently. The focus is on 14 countries of the African Franc zone over the period 1985-2015. Based on the panel Smooth Threshold Regression model, the results reveal that the relationship between external debt and economic growth is based on institutional quality. It is found that the level of indebtedness at which the effect of external debt on economic growth becomes negative is higher in countries with lower levels of corruption and high levels of democracy. This means that poor institutional quality prevents a country from taking full advantage of its credit opportunities. Thus, the more countries become democratic, the more debt helps finance economic growth. These results are robust to sensitivity analysis and Generalized Method of Moments estimation.

**Keywords:** external debt, political institutions, economic growth

**1. Introduction**

The external debt of developing economies has always been one of the main concerns of the international economy. Its generalization, the constant trend towards its increase and the number of actors involved in the problem are indeed a source of great concern. This is due to the consequences that can result from a crisis affecting debtor countries or some of the largest borrowers.

For several decades, the economic literature on the subject has focused on the correlation between external debt and economic growth, identifying threshold effects of the level of external debt (Kourtellos et al., 2013). Several authors, including Krugman (1988) and Sachs (1989) have long supported the thesis that there is a critical debt threshold, beyond which a country's external debt generates adverse effects on its overall economy. In other words, when debt levels are above critical debt thresholds, economic growth is likely to be negatively impacted due to a depression in private and public investment. The work of Pattillo et al. (2002) in a cross-sectional study of 93 developing countries from 1969 to 1998 showed that, on average, a country's external debt had negative effects on economic growth when it exceeded a critical threshold of 160-170 percent of exports, or 35-40 percent of its GDP. Before reaching this threshold, public debt generates a priori positive externalities on economic growth.

Most recent economic studies agree that the level of debt is a key variable in the analysis of the debt-economic growth relationship. However, given the heterogeneity of countries' levels of development (industrialized countries, middle-income countries, low-income countries), we propose to analyze the role of the quality of their political institutions on the debt-economic growth relationship. We defend the idea that institutional factors (democracy, political stability) can prove to be determining factors and themselves become sources of threshold effects (Cadoret et al., 2014).

Thus, the objective of this paper is to analyze the effect of external debt on economic growth, conditional on the quality of political institutions. We seek to estimate the threshold of the quality of political institutions at which external debt would contribute more to economic growth in the African Franc zone, a zone characterized (a priori) by a low quality of democracy (Polity IV, Freedom House) and privileged from the point of view of financing (Beah, 2015). The originality of this study lies in the simultaneous consideration of political-institutional variables (democracy, political stability, etc.), but also in the use of one of the techniques of non-linear model econometrics in the specific context of African countries in the Franc zone. No study, to our knowledge, provides information on this issue as suggested by Kourtellos et al. (2013).

The rest of the paper is organized as follows. Section 2 presents the methodology and an exploratory analysis of the data, Section 3 discloses the results, and Section 4 concludes.

## 2. Methodology and data

### 2.1. Methodology

For our estimates, we will use the Panel Smooth Threshold Regression (PSTR) method of Gonzalez et al. (2005). This is a generalization of threshold effects of Hansen (1999). In our case, the transition variable is the quality of political institutions and the specification of the model to be estimated takes the following form:

$$GROWTH_{it} = \mu_i + a_1 Debt_{it} + a_2 Debt_{it} \Gamma(q_{it}, c) + a_3 X_{it} + \varepsilon_{it}$$

### 2.2. data

The data used come from the World Development Indicators Database (WDI, 2017), with the exception of data on institutional quality from the Polity IV, Freedom House and ICRG databases. The sample covers the period 1985-2015 (31 years) and includes 10 countries in the African Franc zone<sup>1</sup>.

## 3. Presentation of the results of the PSTR model

The results of the PSTR estimation of the relationship between external debt and economic growth using institutional quality as a transition variable are presented below. First, we present the results of the non-linearity and number of regimes tests. Next, we present the results of the estimates followed by our comments. Finally, we proceed with the robustness check. For the linearity test, we use the Fisher LM test. The results are presented in Table 1.

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<sup>1</sup>Burkina Faso, Cameroon, Congo, Ivory Coast, Gabon, Guinea, Mali, Niger, Senegal, Togo.

**Table 1: Fisher's LM Test**

| Transitional variables    | LM <sub>F</sub> Test | P-Value  |
|---------------------------|----------------------|----------|
| Political stability       | 11.911               | 0.001*** |
| Corruption                | 2.170                | 0.04**   |
| Socio-economic conditions | 11.911               | 0.001*** |
| Democracy (ICRG)          | 3.212                | 0.001**  |
| Quality of laws           | 0.628                | 0.05*    |
| Democracy (Polity IV)     | 0.379                | 0.76     |
| Democracy (Polity 2)      | 4.466                | 0.001*** |

Source: authors from WinRats. H0: linear model VsH1: PSTR model with at least one threshold.  
 \*\*\*Significance at 1%; \*\* Significance at 5% and \* Significance at 10%.

The null hypothesis that the model is linear is rejected for the transition variables, with the exception of the Polity IV democracy variable. The alternative hypothesis of a non-linear relationship is therefore accepted. Thus, a PSTR model can be used to estimate this relationship, after choosing between the PESTR (Panel Exponential Smooth Transition Regression) and PLSTR (Panel Logistic Smooth Transition Regression) model families. The selection test is presented in Table 2.

**Table 2: Fisher Selection Test: Choice between PESTR and PLSTR**

| Transitional variables    | PLSTR         |                  | PESTR         |                         |
|---------------------------|---------------|------------------|---------------|-------------------------|
|                           | F stat        | P-value          | F stat        | P-value                 |
| Corruption                | H01           | 0.4754279        | 0.6224        |                         |
|                           | <b>H02</b>    | <b>1.2163263</b> | <b>0.2986</b> |                         |
|                           | H03           | 4.8418839        | 0.0089        |                         |
| Political Stability       |               |                  | <b>F stat</b> | <b>P-value</b>          |
|                           |               |                  | H01           | 4.684942 0.0100         |
|                           |               |                  | <b>H02</b>    | <b>9.247581 0.0001</b>  |
| Socio-economic conditions |               |                  | <b>F stat</b> | <b>P-value</b>          |
|                           |               |                  | H01           | 2.8199100 0.0616        |
|                           |               |                  | <b>H02</b>    | <b>5.0352773 0.0072</b> |
| Democracy (ICRG)          |               |                  | <b>F stat</b> | <b>P-value</b>          |
|                           |               |                  | H01           | 8.035633 0.0000         |
|                           |               |                  | <b>H02</b>    | <b>20.910370 0.0000</b> |
| Quality Of Laws           | <b>F stat</b> | <b>P-value</b>   |               |                         |
|                           | H01           | 0.8549131        | 0.3560        |                         |
|                           | <b>H02</b>    | <b>0.5589963</b> | <b>0.4553</b> |                         |
| Democracy (Polity 2)      | <b>F stat</b> | <b>P-value</b>   |               |                         |
|                           | H01           | 10.488013        | 0.0014        |                         |
|                           | <b>H02</b>    | <b>1.356550</b>  | <b>0.2454</b> |                         |
|                           | H03           | 1.434187         | 0.2323        |                         |

Source: authors from WinRats.

Once the linearity test and the test of the choice between PESTR and PLSTR have been performed, we identify the number of transition functions. The methodology of the F-statistic LMF sequential test is generally used for the residual non-linearity test (Number of regimes test). We find that the one-threshold model (two regimes) adequately captures the non-linear relationship. Table 3 presents the estimates of the PSTR model using the non-linear least squares method.

**Table 3:** External Debt, Institutions, and Economic Growth

|   | Model              | Model 2             | Model 3                   | Model 4               | Model 5             | Model 6            |
|---|--------------------|---------------------|---------------------------|-----------------------|---------------------|--------------------|
|   | Corruption         | Political stability | Socioeconomic conditions. | Democracy (ICRG)      | Quality of laws     | Democracy Polity   |
| Constant                                | -0.49<br>(-0.987)  | 0.0366<br>(0.789)   | -520.074<br>(0.009)       | -7.49***<br>(-0.7599) | 26.002<br>(0.00885) | 0.28*<br>(1.787)   |
| Government Expenditures                 | 0.59***<br>(3.278) | 0.48**<br>(2.393)   | -3.494<br>(-0.008)        | 3.7103***<br>(9.533)  | -54.92<br>(0.008)   | -0.386<br>(-0.255) |
| Domestic Credits                        | 0.10<br>(0.565)    | 0.98***<br>(16.994) | 348.97<br>(0.009)         | 0.2395***<br>(3.2056) | 0.341***<br>(3.864) | -0.09<br>(-1.032)  |
| Population growth                       | 0.97*<br>(1.871)   | 19.356<br>(0.004)   | 520.04<br>(0.009)         | 7.838***<br>(7.948)   | -25.78<br>(-0.008)  | 0.139<br>(0.682)   |
| $Debt_{it}$                             | 0.11<br>(0.580)    | -0.059<br>(-0.780)  | 4.125<br>(0.010)          | -3.166***<br>(-8.135) | 55.321<br>(0.008)   | -0.033<br>(0.325)  |
| $Debt_{it} * f(q_{it}; \gamma, c): a_2$ | -0.04<br>(-0.219)  | -0.0755<br>(-1.202) | -348.59<br>(-0.009)       | 0.0799<br>(1.225)     | 0.163*<br>(1.579)   | 0.051<br>(0.507)   |
| $\gamma$                                | 134.56*<br>(1.772) | 0.881<br>(0.890)    | 0.810<br>(0.066)          | 285.94<br>(0.001)     | 0.806<br>(0.768)    | 0.281<br>(0.576)   |
| C                                       | 1.92<br>(2.384)    | 0.777**<br>(2.458)  | -0.63<br>(-0.0147)        | 3.308***<br>(6.158)   | -6.206<br>(-0.041)  | 1.768<br>(1.442)   |

Source: authors from WinRats.

The slope appears to be low for 04 transition variables (the highest value is 0.881 for political stability). It is concluded that there is a gradual transition, implying that a PSTR model is well suited. This means that depending on these variables, the relationship between external debt and growth cannot be reduced to a limited number of regimes. We find that the lag between the two extreme regimes occurs around the location parameter c (the four location parameters seem far from their respective mean values). We conclude that only countries with good institutions can effectively exploit the benefits of external debt for economic growth. However, the slope seems to be high for 2 transition variables (Corruption: 134.56 and democracy: 285.94).

These results show that economic growth is less sensitive to external debt in countries with weak institutions. We find a direct negative and unstable impact (with values between -348.59, and -0.04) of public debt on growth, measured by  $a_2$  and insignificant in 3 regressions (corruption, political stability and socioeconomic conditions). This result is consistent with the empirical literature which shows that there is a negative relationship between external debt and economic growth for highly corrupt and/or politically unstable countries (Shleifer and Vishny, 1993; Cadoret et al., 2014).

However, we find a positive and unstable direct impact (with values between 0.05 and 0.16) of the external debt on growth in 3 regressions (democracy, quality of laws and political regime). This result suggests that the more the country becomes more democratic, the better the debt finances economic growth. Overall, these results show that the level at which the effect of debt on growth becomes negative is higher in countries with less corruption and a high level of democracy, meaning that poor institutional quality prevents a country from taking full advantage of its credit opportunities. This result is similar to the findings of the Jalles (2011). Moreover, for all transition variables, we find that the external debt ratio  $a_1$  is unstable. This implies that an increase in the transition variables leads to an increase in the external debt coefficient. Thus, in countries with a high institutional level, there is a positive effect of public debt on economic growth. This result, so far, confirms the idea that good institutions (e.g. a high level of democracy and governmental stability) are considered one of the main factors for maximizing growth in African countries in the Franc zone. It is emphasized that the quality of institutions influences the level of external debt and, consequently, economic growth.

For robustness control, a dynamic panel model using the generalized moment method (GMM) seems appropriate. However, one of the conditions for using GMM is that  $N > T$ , for this purpose, this study uses the five-year average of each of the variables listed above except for the initial level of real per capita income (first year of five years). The robustness control confirms the results obtained from the PSTR Model in terms of sign and significance of all the control variables (see Table 4). With regard to our variable of interest, i.e. the external debt, the GMM estimate shows on the one hand that it is significant and positive. On the other hand, the combined effect is negative and significant for the institutional variables, with the exception of government stability, which means that the influence of external debt on economic growth depends on the quality of institutions.



**Table 4: Estimated GMM Model coefficients**

| Variables                 | Model 1               | Model 2              | Model 3                   | Model 4               | Model 5               | Model 6               |
|---------------------------|-----------------------|----------------------|---------------------------|-----------------------|-----------------------|-----------------------|
|                           | Corruption            | Political stability  | Socioeconomic conditions. | Democracy (ICRG)      | Quality of laws       | Democracy (Polity)    |
| GDP <sub>(t-1)</sub>      | 0.102<br>(0.459)      | -0.861***<br>(0.000) | 0.265*<br>(0.076)         | 0.165<br>(0.252)      | 0.138<br>(0.333)      | 0.398*<br>(0.055)     |
| External Debt.            | 2.428**<br>(0.019)    | 1.081<br>(0.244)     | 2.956**<br>(0.034)        | 2.758**<br>(0.026)    | 2.35**<br>(0.049)     | 2.916*<br>(0.097)     |
| (Debt*Inst.) <sup>2</sup> | -0.1614***<br>(0.004) | -0.005<br>(0.335)    | -0.048**<br>(0.025)       | -0.299**<br>(0.012)   | -0.271**<br>(0.030)   | -0.022*<br>(0.097)    |
| Government Expenditures   | -1.355***<br>(0.0001) | -0.225<br>(0.202)    | -1.446***<br>(0.0001)     | -1.625***<br>(0.0001) | -1.551***<br>(0.000)  | -1.542***<br>(0.0001) |
| Domestic Credits          | 0.2355**<br>(0.016)   | 0.032<br>(0.656)     | 0.308***<br>(0.008)       | 0.249**<br>(0.019)    | 0.231**<br>(0.024)    | 0.378**<br>(0.021)    |
| Institutions              | 0.2355**<br>(0.7877)  | 0.236<br>(0.561)     | 0.831***<br>(0.767)       | 0.998**<br>(0.199)    | 0.145**<br>(0.467)    | 0.957**<br>(0.009)    |
| Population growth         | 15.08***<br>(0.001)   | 7.235**<br>(0.041)   | 16.614***<br>(0.0001)     | 21.93<br>(0.0001)     | 17.087***<br>(0.0001) | 19.855<br>(0.0001)    |
| Constant                  | 18.58<br>(0.0001)     | -0.832<br>(0.546)    | 17.764<br>(0.001)         | 23.09<br>(0.0001)     | 21.79***<br>(0.0001)  | 17.50***<br>(0.007)   |
| Number of countries       | 10                    | 10                   | 10                        | 10                    | 10                    | 10                    |
| Instruments               | 5                     | 5                    | 5                         | 5                     | 5                     | 5                     |
| AR(2)                     | 0.573                 | 0.473                | 0.936                     | 0.475                 | 0.610                 | 0.994                 |
| Sargan test               | 0.267                 | 0.136                | 0.284                     | 0.355                 | 0.200                 | 0.438                 |

Source: authors from Stata 15. Note: The dependent variable is the real GDP growth rate. \*\*\*Significance at 1%; \*\* Significance at 5% and \* Significance at 10%. The p-values are shown in brackets.

#### **4. Conclusion**

This paper analyzed the impact of political institutions on the external debt-economic growth relationship in the African Franc zone using the PSTR Model (Panel Smooth Threshold Regression), completed by the GMM in system to control the robustness of the results. The results obtained show that the institutional environment affects the external debt-economic growth relationship. The effect of external debt is negative for countries with low quality institutions. Moreover, the more countries become more democratic, the more debt tends to finance economic growth. Estimation by the GMM method confirms the results obtained and these results are in line with several empirical works.

## Appendices

Appendix 1: descriptive statistics of the variables (1985-2015)

| Variable                  | Obs | Mean  | Std. Dev. | Min    | Max    |
|---------------------------|-----|-------|-----------|--------|--------|
| Political stability       | 310 | 7,41  | 2.206     | 2.33   | 11.08  |
| Corruption                | 310 | 6.57  | 1.57      | 2      | 9.5    |
| Socio-economic conditions | 310 | 2.535 | 4.742     | -8.703 | 49.998 |
| Democracy (ICRG)          | 310 | 2.83  | 2.818     | 0      | 8      |
| Quality of laws           | 310 | 2.57  | 0.705     | 1      | 4      |
| Democracy (Polity)        | 310 | -1,03 | 5.225     | -9     | 8      |

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