



# **IMPACT OF MACROECONOMIC AND INSTITUTIONAL FACTORS ON TAX REVENUES: NEW EVIDENCE FROM TOGO**

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## **Abstract**

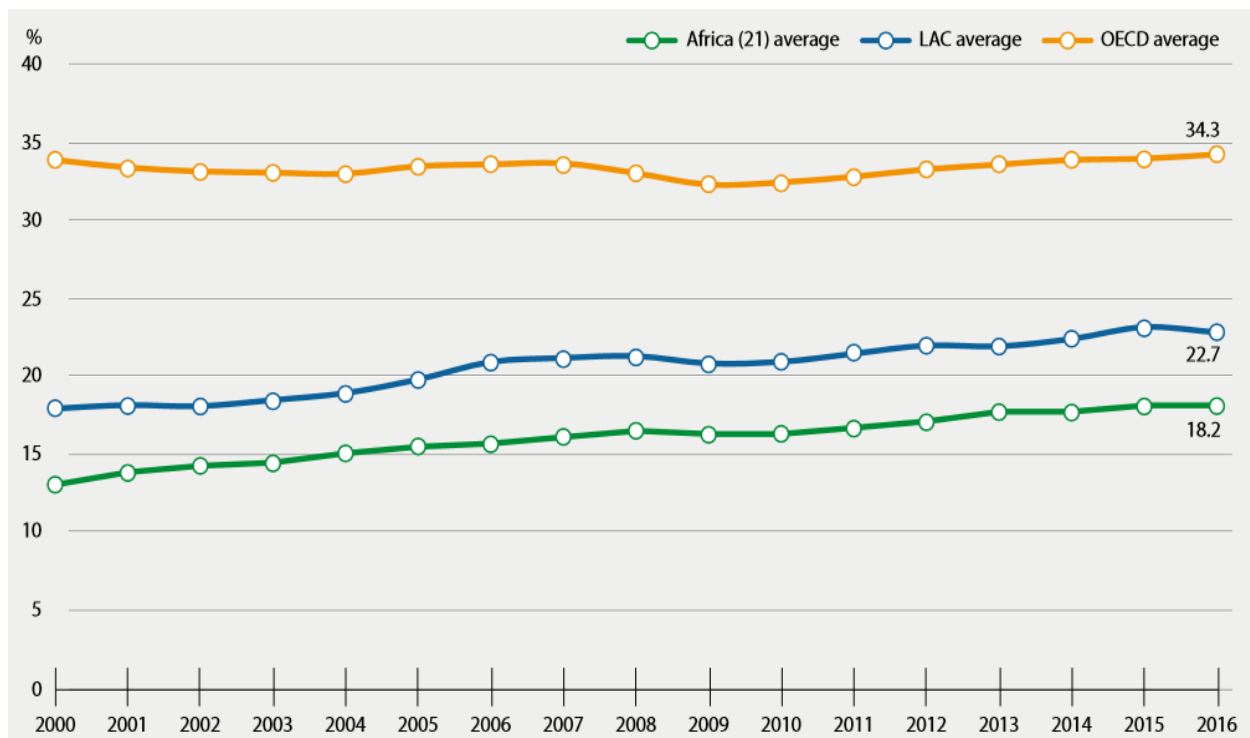
*By using data from time series (1988 to 2017), this study aims to examine the impact of macroeconomic and institutional factors on public revenues in Togo empirically. The data were statistically treated using Johansen Co-Integration Approach and Vector Error Correction Model (VECM). A set of factors that can potentially impact tax revenue, such as the tax rate, per capita GDP, trade openness, political instability, and corruption, is considered in the econometric analysis. The results obtained signify that structural factors such as per capita GDP, trade openness impact significantly tax revenue in Togo. In addition to that, tax rate and reforms aiming at reducing corruption also contribute to raising tax revenue performance. Moreover, we found evidence that political instability impact negatively tax revenue in Togo. Based on these results, we recommend several policies in the direction of better tax revenue mobilization.*

*Keywords: Tax revenues, Johansen co-integration approach, vector error correction term, macroeconomic factors, institutional factors, Togo*

## INTRODUCTION

The issue of tax revenue determinants remains an interesting topic for researchers, given the importance of tax revenues in the financing of public policies but also in the capacity building of the state. This is even more important for developing countries, which are in great need of their resources to finance their development since foreign financing is a source of indebtedness. In 2015, the General Assembly of the United Nations set 17 international targets (also called the Sustainable Development Goals) for the year 2030, to achieve a better and more sustainable future for the world. Reaching the Sustainable Development Goals (SDGs) involve a level of revenue mobilization capacity in developing countries (Addison, Niño-Zarazúa, & Pirttilä, 2018). This remains a significant issue for many developing countries that are facing a budget deficit almost every year. Since 2000, Tax Revenue has increased significantly globally, driven by Taxes on income and profits, and from Value Added Tax (VAT) (Organisation of Economic and Co-operative Development, 2017). In 2016, in OECD countries, tax revenues on GDP averaged 34.3%. Despite this global rise, Africa remains the continent where this average was below 20% (see figure 1).

Figure 1: Tax-to-GDP ratios, 2000-2016

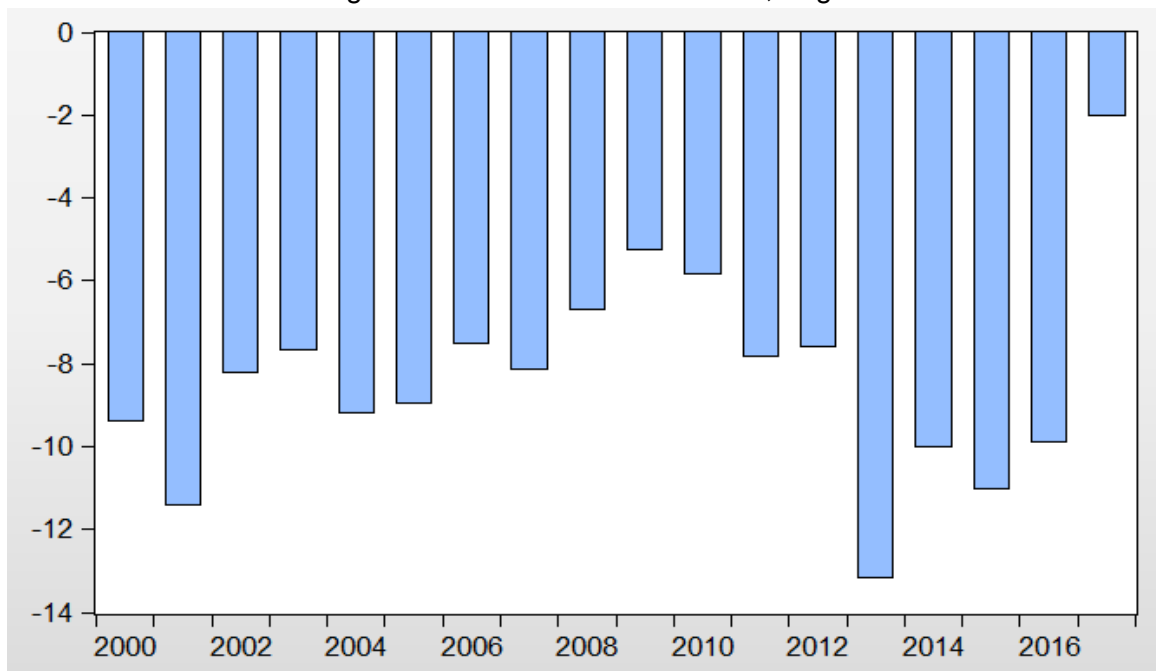


Source: OECD/ATAF/AUC (2018),

Revenue Statistics in Africa 2018, <http://oe.cd/revenue-statistics-in-africa>.

In Togo, despite a significant increase in tax revenues, which went from 15.88% of GDP in 2012 to 19.05% in 2016, with a deceleration in 2017 (17.45%), the macroeconomic environment is characterized by a structural deficit of current accounts as a share of GDP. From 5.25% in 2009, this deficit rose to 11% in 2015, with a marked improvement between 2016 and 2017 (see Figure 2). The GDP has fluctuated around 5% since 2014, from 5.87% to 5.57% in 2017 (World Bank, n.d.). With a projected population growth rate of 2.5% and where 40% of the population is under 15 years of age, the Togolese State needs financial means to meet the needs of the people. For several years, the Togolese Government has put in place some development programs aimed at strengthening development, and reducing poverty estimated at 55.1%. We can mention, among others, the Poverty Reduction Strategy Paper (DSRP), the Strategy for Accelerated Growth and Employment Promotion (SCAPE), and the National Development Program (PND). All these development programs, which are ambitious, need to be funded by endogenous resources for better performance. For this reason, the government needs to improve tax revenues collection, which is the primary source of government revenue.

Figure 2: Current account balance, Togo



Source: Author's-processed based on data from the World Bank

This paper attempts to find out the impact of macroeconomic and institutional factors such as tax rate, per capita GDP, trade openness, political instability, and corruption on tax revenue in

Togo by using time series data over the period 1988 - 2017. This study is one of the few studies which have investigated the key factors that determine tax revenue in Togo. It contributes to the existing literature in the research on tax revenue in Togo by updating the study period and exploring the relationship between economic and institutional variables with tax revenue in Togo. The rest of this article will be organized as follows: Section 2 presents the literature review. Section 3 captures the Johansen's Co-Integration analysis and the vector error correction model, used to explore the existence of both short-run and long-run relationships between tax revenue and the independent variables. Section 4 discusses the empirical results, demonstrating how tax rate, per capita GDP, trade openness, Political stability, and Corruption impact tax revenue in this study. The study's conclusions and policy implications are summarized in section 5.

## LITERATURE REVIEW

The issue of the determinants of tax revenues has always been a subject of great importance in academia, considering the importance of public revenue in the implementation of policies, the provision of public goods, in short, to finance economic development. The works of (Williamson, 1961), (Plasschaert, 1962), (Hinrichs, 1966), (Thorn, 1967), (Lotz, J. R., & Morss, 1967) usually referred to as the first works on this theme of the determinants of tax revenues. In an examination of Tax Effort in Developing Countries, (Lotz, J. R., & Morss, 1967) focused mainly on per capita income and trade openness, as main factors. Since then, many scholars have contributed much to this topic, especially with the work of (Fenochietto & Pessino, 2013). This study found that the main factors on which depend countries tax effort and tax capacity are the level of development, trade, education, inflation, income distribution, corruption, and ease of tax collection. This study uses a panel data analysis gathering about 101 countries using a stochastic frontier methodology. On this line of inquiry, (Garg, Goyal, & Pal, 2016) posit that per capita gross state domestic product, literacy rate, and labor force participation have positive association with tax capacity, whereas a more significant share of agriculture has a negative association. Moreover, according to (Garg et al., 2016), intergovernmental transfers, given tax capacity, have a negative relationship with the tax effort of Indian states.

Using static and dynamic panel data methods, (Castro & Ramírez, 2014) analyze the effect on tax revenues of financial, political, institutional, and social factors in 34 countries from the Organization for Economic Co-operation and Development (OECD). The study revealed that Gross domestic product per capita, the industrial sector, and civil liberties have a positive impact on tax revenue, while the agricultural sector and the share of foreign direct investment gross

fixed capital formation have a negative effect. Before this study, (Gupta, 2007), (Chaudhry, 2010), (Mahdavi, Antonio, & Westerlund, 2008) also found that factors such as agriculture sector, foreign aid, literacy rates, openness, political stability, and a broadening tax base can boost tax revenue performance.

(Alabede, 2017) has undertaken an analysis of economic freedom and tax revenue performance in sub-Saharan Africa for the period 2005 to 2012. The empirical findings of this study stressed that economic freedom promotes tax revenue performance. More precisely, results indicate that property rights freedom, freedom from corruption and investment freedom, as well as the composite economic freedom, exerted a positive and significant impact on tax revenue performance. Furthermore, the study also revealed that agriculture share in GDP and per capita income indicate a negative and significant relationship with tax revenue performance. A similar study on sub-Saharan Africa by (Addison & Jörgen, 2012) demonstrated that tax revenue performance in more open economies is higher. The study also added that countries that are less agricultural reliant, and politically stable also improve tax revenue. Moreover, the study points out the positive impact of value-added tax (VAT) on tax revenue performance.

In a study on Corruption and Tax Structure in American States, (Liu & Mikesell, 2018) report that, states with greater measured public corruption have more complicated tax systems, have higher tax burdens, rely more heavily on regressive indirect taxes, and have smaller shares of their tax burdens with initial impact on business. This result is consistent with previous studies such as (Odd-Helge, F., & Lise, 2003), (Bird, Martinez-vazquez, & Torgler, 2008), (Attila & Combes, 2006) which found a strong relationship between tax revenue performance and corruption.

A recent empirical study by (Ikhatua & Ibadin, 2019) applied an empirical model to measure Tax Revenue Effort in Nigeria. The study adopted a longitudinal research design and used the Autoregressive Distributed Lag (ARDL) method to evaluate the model. Results have shown that Agricultural Sector Productivity, Tourism Sector Productivity, Trade Openness, and Human Capital Development had significant and positive impacts on Tax Revenue Effort in Nigeria. Furthermore, the study also discovered that The Manufacturing Sector Productivity, Telecommunication Sector Productivity, and Capital Flight had significant but negative effects on Tax Revenue Effort in Nigeria.

Through this literature review, we can conclude that macroeconomic, institutional, and social variables are the most determining factors in the mobilization of tax revenues in both developed and developing countries.

## RESEARCH METHODOLOGY

This study uses secondary time series data from World Development Indicators and Government Finance Statistics Year Books of the International Monetary Fund observed over the period 1988-2017. The choice of this study period is motivated by data availability and the need to use consistently measured variables. First, we verify the stationarity of the variables by performing the unit root test. In time-series data analysis, the unit root test makes it possible to check the stationarity of the variables. Indeed, non-stationary times series can lead to spurious correlation when using econometric modeling (Phillips & Perron, 1988). To perform the unit root test, we will use the Augmented Dickey-Fuller (ADF), and Phillips-Perron (PP) approaches. Next, we come up with the optimal Lag Length Selection. The importance of choosing the optimal number of lag comes from the fact that Johansen's Co-Integration model is sensitive to the number of lags (Gordon, 1995), (Hacker & Hatemi-J, 2008). Then, we run the Johansen Co-Integration test, and finally, the Vector Error Correction Model (VECM) which is the restricted VAR model.

The model of this study is specified as follow:

$$TRE_t = f(TRA_t, GDP_t, OPE_t, INS_t, COR_t) \quad (1)$$

Where:

$TRE_t$  = Tax revenue (%GDP) at time t

$TRA_t$  = Tax Rate at time t

$GDP_t$  = Gross Domestic Product per capita at time t

$OPE_t$  = Trade openness at time t

$INS_t$  = Political Instability at time t

$COR_t$  = Corruption Index at time t

In its linear form, the model is specified as follows:

$$TRE_t = \alpha_0 + \alpha_1 TRA_t + \alpha_2 GDP_t + \alpha_3 OPE_t + \alpha_4 INS_t + \alpha_5 COR_t \quad (2)$$

## RESULTS

Before proceeding with the Co-Integration test, we performed a unit root test on each of the variables to be certain they are all integrated of the same order; in our case, I (1). The results of Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root test shows that all the variables of our study are stationary at first difference. The finding that all variables are stationary after first differencing leads us to believe that any long-run relationship if it exists, could not merely be the result of a spurious correlation between tax revenue and its independent variables (Obi, Anarfo, & Obi, 2019). All two tests generated consistent results in

that each series was found to be stationary after first differencing; the results reported in Table 1 are from the Augmented Dickey-Fuller (ADF) test.

Table 1: ADF Unit root test results.

	Level		1 <sup>st</sup> Difference	
	t-statistic	p-value	t-statistic	p-value
TRE	-0.6781	0.7121	-21.3776***	0.0002
TRA	-0.8366	0.6213	-11.8903***	0.0000
GDP	-0.9077	0.9107	-14.9221***	0.0000
OPE	-5.2387	0.8325	-15.0327***	0.0007
INS	-11.030	0.9537	-10.2735***	0.0000
COR	-2.3917	0.8817	-18.3302***	0.0010

H0: Series has unit root (non-stationary). Series assumption: Drift but no trend.

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level.

TRE = Tax Revenue, TRA = Tax Rate, GDP = Per capita GDP, OPE = Openness, INS = Political instability, COR = Corruption

Consequently, we continued with the Johansen co-integration test to determine if the variables unveil a long-run equilibrium relationship. The results of this test indicate the existence of one (1) cointegration equations for the Trace test and one (1) cointegration equation for the Max-eigenvalue test at the 5% level of significance, as shown in Table 3. Before the Johansen co-integration test, we had determined the optimal lag, summarized in Table 2.

Table 2: Optimal Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-864.0148	NA	1.14e+15	60.20792	60.63225	60.34081
1	-689.6381	228.4936*	2.37e+12*	53.76814*	58.01148*	55.09710*

\* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 3: Johansen Co-Integration Test Result  
Target Variable: Tax revenue

H0: No cointegration between Tax revenue and each of the Independent variables				
Hypothesized	Trace Stat	5% Critical value	Eigenvalue	5% Critical value
No. of CE(s)				
None	<b>109.187</b>	<b>93.675</b>	<b>72.982</b>	<b>44.731</b>
At most 1	44.737	77.923	33.553	47.932
At most 2	37.938	49.037	26.322	41.023
At most 3	16.927	27.277	8.433	23.732
At most 4	7.411	14.338	6.923	12.759
At most 5	0.981	4,322	1.391	3.257

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level.

With the presence of cointegration equation, a vector error correction model (VECM) is then estimated. In our study, we use a two-step error correction model approach.

The results (see Table 4 & 5) show that, in the long run, as in the short run, per Capita GDP has a positive effect on Tax revenue, with a 1% level of significance in the long –run and 5% in the short-run. This result is in perfect agreement with economic theory. Indeed, economic activity in a country is a real drive for economic growth, and therefore a factor that has a positive impact on tax revenues. These results are consistent with (Drummond, Daal, Srivastava, & Oliveira, 2012).

Tax rate is positively correlated to tax revenue at 1% of significance in the short-run. Indeed, as stipulated in Laffer's optimal tax theory, there is an optimal level of taxation that allows the state to increase tax revenues. However, in the long run, this coefficient is negative, with a non-significant probability (0.1208). This result indicates that raising the tax rate in the long term would discourage investors, thereby reducing the tax revenue mobilization performance.

The estimated coefficient of the trade openness variable is positive and significant in the short run and the long run. The tax on imports and exports represents a large part of tax revenue in many sub-Saharan African countries. This result confirms the importance of open trade for a country in its process of improving tax revenues. Trade openness in an appropriate economic environment can boost tax revenue performance (Agbeyegbe, Stotsky, & WoldeMariam, 2006).



The results on the institutional variables, Political Stability and Corruption Perception Index, also met our expectations. In the short run, as in the long term, Political Stability has a negative impact on tax revenues. Indeed, an economic environment characterized by political crises that become almost structural discourages economic activity and investment — thus fleeing foreign direct investment. This situation has repercussions on public revenues, which are consequently struggling to increase. Corruption, as measured by the perception of corruption index, has a positive effect on Tax revenue. Indeed, the higher this index, the lower the corruption in the country. The short-term and long-term results demonstrate it.

Overall, the model of this study shows stability as the coefficient of the error correction term is statistically significant. According to econometrics theory, the error correction term (ECT), which is the speed of adjustment in the long-run dynamics equation, must be negative and significant. In the case of our study, the error correction term (ECT) is -0.075074, with a probability of 0.0007 (see Table 4). This coefficient means that about 7.5% of departures from long-run equilibrium is corrected in each period. In other words, 7,5% of disequilibrium in Tax Revenue is corrected in each period. The model also passed diagnostic tests of no heteroscedasticity, serial correlation test, reset test, and the results are shown in Table 6.

Table 4: Long-run dynamic result

Target Variable: Tax Revenue Methods: Least Squared				
	Coefficient	Std. Error	t-Statistic	Prob.
C	1.638721	6.922011	0.397715	0.7892
TRA (-1)	- 2.926733	0.331960	17.83442	0.1208
GDP (-1)	1.114980	0.324592	1.794165	0.0005***
OPE (-1)	0.097255	0.037851	2.758601	0.0149**
INS (-1)	- 0.003122	0.054903	0.159203	0.0257**
COR (-1)	0.523711	0.049217	1.637522	0.0498**
R-Squared	0.973071			
Adjusted R-squared	0.946867			
Durbin-Watson stat	2.535581			
F-statistic	102.2563			0.000000

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level.

Table 5: Short-run dynamic result

Target Variable: Tax Revenue				
Methods: Least Squared				
	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003917	0.890132	0.011799	0.8310
DTRE(-1)	-1.321975	0.041933	-4.466544	0.0001***
DTRA	3.105379	0.169925	24.50311	0.0000***
DGDP	0.574094	0.103512	3.934316	0.0227**
DOPE	9.108032	1.443547	2.710368	0.0086***
DINS	- 0.063071	0.039501	0.972450	0.0397**
DCOR	0.021937	0.051833	0.234603	0.0403**
R-Squared	0.981076			
Adjusted R-squared	0.961138			
Durbin-Watson stat	1.570213			
F-statistic	145.4192			0.000000

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level.

Table 6: Diagnostic Tests

Heteroscedasticity test: Breusch-Pagan-Godfrey			
F-Statistic	0.670925	Prob. F (7,58)	0.6853
Obs*R-squared	5.830911	Prob. Chi-Squared (6)	0.6210
Scaled explained SS	4.209534	Prob. Chi-Squared (7)	0.7801
Heteroscedasticity test: ARCH			
F-Statistic	1.073205	Prob. F (5,91)	0.3309
Obs*R-squared	7.689221	Prob. Chi-Squared (7)	0.4533
Heteroscedasticity test: White			
F-Statistic	0.721089	Prob. F (7,82)	0.6953
Obs*R-squared	5.915501	Prob. Chi-Squared (7)	0.6793
Scaled explained SS	4.881174	Prob. Chi-Squared (7)	0.7319

## Ramsey RESET Test

Table 6....

F-Statistic	0.031922	Prob. F (1,53)	0.8219
Log likelihood ratio	0.030458	Prob. Chi-Squared (1)	0.8057
Heteroscedasticity test: Breusch-Pagan-Godfrey			
F-Statistic	0.670925	Prob. F (7,58)	0.6853
Obs*R-squared	5.830911	Prob. Chi-Squared (6)	0.6210
Scaled explained SS	4.209534	Prob. Chi-Squared (7)	0.7801

## CONCLUSION AND POLICY IMPLICATIONS

Based on the widely documented factors affecting tax revenue, this study sought to determine the impact of the Tax rate, per capita GDP, Trade openness, Political instability, and Corruption on Tax Revenue in Togo over the period 1988 2017. Overall, the empirical results show that all the macroeconomic variables such as Tax rate, per capita GDP, Trade openness are positively correlated with Tax revenue. Besides, the variable measuring political instability negatively impacts the mobilization of tax revenues whereas the fight against corruption has a positive effect on tax revenues.

This research advocates a substantial decentralization of tax administration in the regions of the country, which will allow people to better understand the issue of taxation because the more people participate in decisions, the more they accept local tax, which enables the promotion of local financial governance. The question of the implementation of tax reforms induces that of good governance. Sub-Saharan African countries are often characterized by a deficit of good governance and an increased presence of corruption within the public administration, which has a negative impact on the economy and thus, the mobilization of tax revenues. Our study recommends reforms aimed at establishing good governance and actively fighting against corruption.

Tax reforms aimed at alleviating or eliminating taxes for new local businesses in their first months of activity, especially Small and Medium Enterprises (SMEs), are to be encouraged to promote the creation of enterprises to solve the issue of youth unemployment and also to increase Tax revenues. This measure should focus mainly on local businesses.

The policy of increasing the GDP growth rate could, for example, involve increasing the production of goods and services, especially agricultural production. Parallel to this measure, the government should continue its policy of construction of roads in urban and remote areas. Indeed, it is clear that Togolese peasants have great difficulty in selling their agricultural produce because of the disastrous state of roads in and rural areas.

Increasing the GDP growth rate also means supporting small industries and crafts. Industrialization is one of the policies that rapidly accelerate GDP growth. Sub-Saharan Africa is unfortunately characterized by a low rate of industrialization. Togo, in particular, has seen most of its post-colonial industries ruined and plunged into bankruptcy. The revival of manufacturing is more than ever essential to allow the transformation of certain agricultural products in Togo, which will create a lot of jobs and added value. All of this will result in increased GDP and better mobilization of tax revenues.

Increasing the production of goods and services is often the responsibility of the public sector and the private sector. Indeed, in most modern or developed economies, the private sector is the primary provider of employment. A policy aimed at improving the private sector is strongly encouraged. The development of Small and Medium Enterprises must be at the core of public policies.

The development of a country cannot be done by being in autarky. Every country necessarily needs to build bilateral and multilateral economic relations. This involves the implementation of political and economic reforms aimed at improving the attractiveness of the economy. This measure will allow the increase of Foreign Direct Investments in the country. FDI is vital in the development of any country because it is an investment that does not generate public debt.

Sub-Saharan Africa and West Africa, in particular, is characterized by chronic political instability, which tends to become structural. The economic environment of a country is very much related to its political context. In other words, a state characterized by repeated political crises has great difficulty in attracting investors, and even fleeing its citizens who are the first investors and the central workforce. From the perspective of better mobilization of tax revenues, the government must at all costs stabilize the political climate by strengthening the institutions of the republic, but also by ensuring respect for the separation of powers.

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