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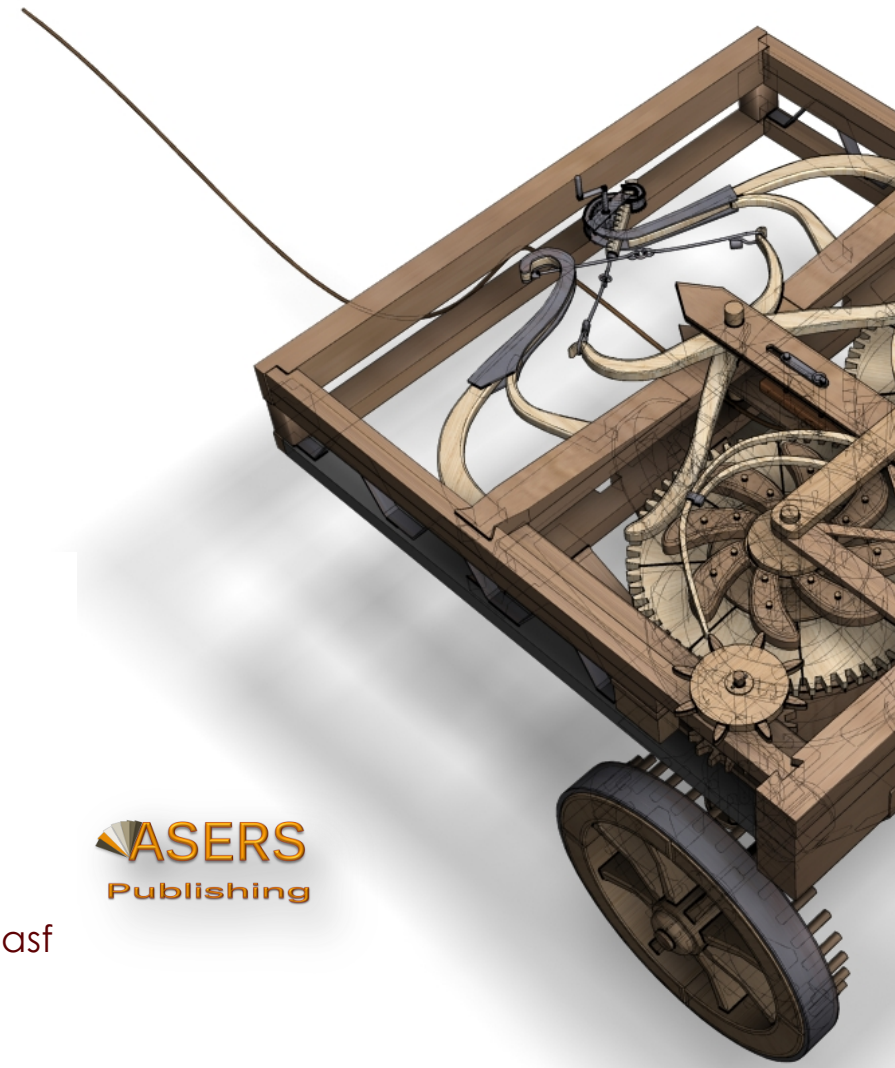

Biannually

Volume VIII
Issue 2(16)
Winter 2017

ISSN 2068 – 8393
Journal **DOI**
https://doi.org/10.14505/jasf

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Journal of Advanced Studies in Finance

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Winter 2017
Volume VIII
Issue 2(16)

Contents:

ASERS Publishing
http://www.asers.eu/asers-publishing

ISSN 2068-8393

Journal's Issue **DOI**:
https://doi.org/10.14505/jasf.v8.2(16).0

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Volume IX, Issue 1(17), Summer 2018

Journal of Advanced Studies in Finance

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Journal of Advanced Studies in Finance

DOI: http://dx.doi.org/10.14505/jasf.v8.2(16).03

Effect of Tax Revenues on Economic Growth in Benin: The Role of Investment

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Suggested Citation:

Nonvide, G. M. A., and Amegnaglo, C. J. 2017. Effect of Tax Revenues on Economic Growth in Benin: The Role of Investment. *Journal of Advanced Studies in Finance*, Volume VIII, Winter, 2(16): 139-145. DOI:10.14505/jasf.v8.2(16).03

Article's History:

Received November, 2017; *Revised* November, 2017; *Published* December, 2017.

Abstract:

Benin's economy relies mainly on tax revenues. This paper analyses the role of investment in the relation between tax revenue and economic growth in Benin. It employed the Fully Modified Ordinary Least Squares technique to estimate the long run relationship among the variables of the model. Results indicate positive effect of tax revenues on economic growth. This effect is improved by the private investment while deteriorated by public investments which level remains low. This result emphasizes the problem of public resources allocation in Benin. Other determinants of economic growth include investment, annual population growth rate, and trade. The study recommends that fiscal policy must promote private investments. Tax revenues must be directed to more productive investments. The results also favour trade open policy.

Keywords: tax revenues; economic growth; investment; Benin

JEL Classification: C32; E62; H21

Introduction

Like majority of developing countries, Benin's economy relies mainly on tax revenues. Public expenditure in Benin is financed at 90% by tax revenues, of which 67% is derived from indirect taxes (Ministry of Economy and Finance (MEF), 2013). Since 2000, Benin has undertaken a series of tax reforms in order to exploit the public resources potential and to improve the level of government revenues. These reforms include incentives for business start-ups, informal formalization, companies' registration for Single Tax Identification (IFU), monitoring of taxpayers and taxable matters with a view to broadening the tax base or easing the tax burden. Despite easing measures, often contradictory, and difficulties in making the tax system more transparent, the reforms initiated have increased the ratio of tax revenues to gross domestic product (GDP), which had risen from 10.2% in 2000 to 15.7% in 2010 and 17% in 2015 (Central Bank of West African States (BCEAO), 2017).

The mobilization of domestic resources has therefore become a necessity for the economic growth of countries. Thus, in most developing countries, including Benin, the tax levy is seen as a secure way for the state to clean up its budgetary revenues. Fiscal policy is a key factor in economic policy decisions, which involve an increase in tax revenues. The positive effects of fiscal policy were highlighted by endogenous growth models. These models show that when taxes are used to finance public investment in infrastructure, education and health, they can be favourable to growth (Lucas 1988, Barro 1990).

However, policies to increase tax revenues cannot be effective in an unlimited way, since economic agents can alter their production, consumption or savings decisions, falling into "inactivity traps" or even tax evasion (Saez *et al.* 2012). This corroborates Laffer's theory, which states that "too much tax kills tax". This led to the search of a taxation system based on the maximization of a social welfare function (Beleau 2013). It is therefore, important to find tax rates that reflect the goals of equity and efficiency without losing sight of the health of the public finances (Mirrless 1971). As noted by Bird (2003), the most effective tax for developing countries is one that produces the largest amount with a lower cost.

The aims of this paper is to analyze the role of investment in the relation between tax revenue and economic growth in Benin. This study is in line with works that have shown the importance of domestic resources in the growth of developing economies. It adds to knowledge, the role of investment in the effects of tax revenue on economic growth. It therefore proposes answers to the following main research questions: What is the effect of tax revenues on economic growth in Benin? Is this effect conditioned by investment? Is there a complementarity or substitution relationship between tax revenues and investment? These are questions whose answers will contribute to the economic transformation in Benin.

1. Literature review

In new theories of growth, taxation affects the supply of labor and technological progress, endogenous growth factors that depend on the behavior of economic agents (Romer 1986, Lucas 1988) and determine the growth rate in the steady state. Taxation affects not only the transitional growth rate but also the long-term growth rate. Thus, taxation on income from work affects the allocation of time between work and leisure. According to Lucas and Rapping (1969), when the real wage is temporarily lower the amount of labor supplied tends to decrease (substitution effect) as agents that anticipate higher wages will temporarily increase their leisure time. However, a lower wage impoverishes the holder, hence a reduction in the demand for leisure (income effect). Faisal and Salwa (2016) showed that tax can be an important tool to contribute to long-term growth in. Based on the endogenous growth model of Barro (1990), Hamzaoui and Bousselhami (2017) showed that there is a positive relationship between taxation and economic growth in Morocco, through its impact on public capital. Because of taxation, households contribute to the financing of public capital, which leads to improved economic growth. Using ordinary least square (OLS) regression technique, Ofoegbu *et al*. (2016) have shown positive relationship between tax revenue and economic development in Nigeria. They concluded that tax revenue can be an instrument of economic growth. These results confirm previous studies in Nigeria by Success *et al.* (2012) and Bukie and Adejumo (2013). Aamir et al. (2011) found significant impact of taxation on the total revenue of the economy of India.

However, an increase in the tax burden does not always lead to a revival of economic activity. According to Laffer (1981), the increase in the tax burden would discourage productive activity and hence would have a negative influence on economic growth. Firstly, high taxes can affect the physical capital stock directly by discouraging private investment (Chambas 1994, Arthur 1997). Secondly, when the income tax rate is too high, economic agents reduce their working time and spend more time on recreational activities. Thirdly, fiscal policy can dampen overall labor and capital productivity growth by reducing research, innovation and development activities. Fourthly, fiscal policy can also affect the marginal productivity of capital by causing a diversion of private investment in productive sectors "heavily" taxed to the activities subject to a more advantageous tax but with low productivity (Harberger 1962, Skinner 1988). Fifthly, an increase in the tax burden could lead to detours taken to avoid taxes and a flowering of the underground economy (Kesselman 1989, Engen and Skinner 1992, Garagata and Giles 1998, Trandel and Snow 1999).

2. Methodology

Theoretical framework

This study uses a neoclassical growth model which is based on the aggregate production function of the entire economy. The theory pointed out the importance of physical and human capital growth and growth of labour productivity as main factors of economic growth. This is stated as follows:

$$Y = f(K, L) \quad (3.1)$$

where: Y is the level of economic output measured by the Gross Domestic Product (GDP). K denotes the physical capital stock and L the labour force.

Assuming a Cobb-Douglas functional form, equation (3.1) can be expressed as:

$$Y = AK^{\alpha}L^{\beta} \quad (3.2)$$

Traditionally, in Solow's (1956) model, changes in A are thought to captures technological progress. Access to technology may in turn accelerate economic growth.

Model specification

To model the effect of tax revenue on economic growth, the study adopts the following economic growth function:

$$GDP = f\ (PI, PUI, AP, TO, TR) \quad (3.3)$$

From equation (3.3), GDP denotes the dependent variable; PI is the private investment, PUI denotes the public investment, AP the annual population growth rate, TO the trade opening, and TR the tax revenues.

Equation (3) was finally specified as:

$$\log GDP = \alpha_0 + \alpha_1 PI + \alpha_2 PUI + \alpha_3 TO + \alpha_4 AP + \alpha_5 TR + \alpha_6 (PI * TR) + \alpha_7 (PUI * TR) + u_i \quad (3.4)$$

From equation (3.4), α_0 is the constant term, $\alpha_1 \ldots, \alpha_7$ represent the parameters to be estimated relative to the explanatory variables, while u_i is the error term.

Economic theory have shown the crucial role of investments in economic growth. Both private and public investments are considered in this study. The expected signs are positive. Trade opening has been used in the literature as a main determinant of economic growth. It was included in the model to test its effect on economic growth. Trade opening is measured by exports and imports to GDP ratio. Following the works of Artelaris et al. (2007) and Tumwebaze and Ijjo (2015), it is expected positive sign for the coefficient of this variable. Population growth rate was included in the model to test if economic growth in Benin was driven by an increase in the population growth. The literature is divided in this subject. According to Tartiyus et al. (2015) and Tumwebaze and Ijjo (2015) an increase in the population growth rate contributed to the economic growth. Others studies (Easterlin 1967, Jhingan 2005, Todaro and Smith 2006, Klasen and Lawson 2007) have shown negative effects such as pressure on natural resources and reduction of public and private capital formation. The Malthusian population trap is the main argument for theories that support negative impact of population growth on economic development. The works of Aamir *et al.* (2011), Ofoegbu *et al.* (2016), and Hamzaoui and Bousselhami (2017) have found positive relationship between tax revenues and economic growth. Tax revenues are used for financing public expenditure. Therefore, they are expected to have positive effect on economic growth. Interactions terms between private investment and tax revenues, and public investment and tax revenues were included in the model to test for the complementarity or substitution effect between tax revenues and the different types of investments.

Data and estimation technique

The study uses times series data covering the period 1980 to 2015. All the data are obtained from the BCEAO databases. The Fully modified Ordinary Least Squares (FM-OLS) estimation technique was used. It is a semi-parametric model developed by Phillips and Hansen (1990), providing optimal estimates of co-integrating regressors. It has an advantage over the Engle and Granger techniques by introducing appropriate correction to overcome the inference problem in Engle and Granger method and hence, the t-test for long-run estimates are valid (Himansu and Hunt 2007, Bashier and Siam 2014). The FM-OLS modifies the OLS method to account for serial correlation effects and is robust to endogeneity, and both stationary and non-stationary series (Phillips 1995, Mamingi 1997, Wang and Wu 2012, Adom *et al.* 2015).

3. Results and discussion

Unit root and Co-integration tests

The study uses the Augmented Dickey Fuller (ADF) test. The ADF fails to reject the null hypothesis of unit root for the gross domestic product, private investment, public investments, active population, tax revenue and trade opening in levels (Table 1). After first difference, however, the results indicates that all the variables are integrated of order one, I (1) process.

Table 1. Unit root test

Variables	Level	First difference	Order of integration
Gross domestic product	-0.640	-5.512***	I (1)
Private Investment	1.044	-3.576***	I (1)
Public Investment	1.543	-2.856**	I (1)
Active population	1.663	-5.494***	I (1)
Tax revenue	3.400	-3.351**	I (1)
Trade opening	-2.044	-5.143***	I (1)

Note: ***, ** significant respectively at 1% and 5%.

Since the variables used in the model are I (1), then the Johansen's co-integration test was run to test for long run equilibrium. The null hypothesis is that there is at least one linear combination of the variables that is I (0). For this test, when the trace statistic is less than its critical value at 5%, the null hypothesis cannot be rejected. The results confirm that there exists two (2) co-integrating relations (Table 2). Therefore, the regressors of the model might be treated as the "long run forcing" variables (Adom *et al.* 2015) explaining economic growth in Benin.

Table 2. Johansen tests for co-integration

Maximum rank	Trace statistic	5% critical value
0	116.66*	94.15
1	75.81*	68.52
2	40.93	47.21
3	18.68	29.68
4	08.83	15.41
5	00.93	03.76

Note: * denotes rejection of null hypothesis

Determinants of economic growth

When non-stationary variables are found to be co-integrated, the full modified ordinary least square method can be used to estimate the long run relationship among the variables of the model. Table 3 presents the results of the long run equation of economic growth. The R^2 value shows that the explanatory variables explain about 80 % of variation in the economic growth. All the variables comply with the expected signs.

Table 3. The estimated long run equation

Dependent Variable: ln GDP	Coefficient	Std. errors	Prob
Private Investment	0.030***	0.003	0.000
Public Investment	0.036***	0.004	0.000
Population growth	- 0.197*	0.101	0.053
Trade opening	0.017***	0.003	0.000
Tax revenue	0.006***	0.001	0.000
Tax revenue * Private investment	0.0001***	0.00001	0.000
Tax revenue * Public investment	- 0.0001***	0.0002	0.000
Constant	8.427***	0.331	0.000
R^2 = 0.80			n = 35

Note: ***, * indicate 1% and 5% significance levels respectively.

In line with the economic theory, private and public investments have positive and significant effect on economic growth. This confirms that economic growth in Benin is driven by investments. The effect of population growth was found to be negative and significant at 10%. This suggests that population growth led to lower economic growth in Benin. This result is in line with some theoretical analyses (Easterlin 1967, Jhingan 2005, Todaro and Smith 2006, Klasen and Lawson 2007) which proved that high population growth increases pressure on limited natural resources and reduce public and private capital formation. Trade openness also has positive effect on economic growth. The effect is significant at 1% significance level. This implies that more open trade policies contribute to increasing economic growth. Trade liberalization, therefore promotes economic growth. This result is consistent with the works of Artelaris *et al.* (2007) and Tumwebaze and Ijjo (2015).

As expected the results also indicated positive and significant effect of tax revenue on economic growth. This is consistent with the works of Aamir *et al.* (2011), Ofoegbu *et al.* (2016), and Hamzaoui and Bousselhami (2017). However, the relationship depends on investments. Indeed the coefficient of interaction between tax revenue and private investment is significant and positive, implying a complementarity relationship between tax revenue and private investment. This suggests that the effect of tax revenue on economic growth depends positively on private investment. The private investment improves the relationship between tax revenue and growth. Therefore, government authorities must set a tax rate favourably to private investment. A negative and significant coefficient was observed for the interaction between tax revenue and public investment, suggesting a substitution effect between tax revenue and public investment in Benin. This means that the public investment deteriorates the correlation between tax revenue and growth. This result may be explained by the low ratio of public investment to public expenditure in Benin, which oscillates around 30% (MEF 2016). For instance, between 2011 and 2016, it rose from 31.4% in 2011 to 27.23% in 2014 and to 30.1% in 2016 (MEF 2016). This finding emphasizes the problem of public resources allocation in Benin.

Conclusion

The primary objective of this paper was to analyze the role of investment in the relation between tax revenue and economic growth in Benin. The study uses time series data obtained from BCEAO over the period from 1980 to 2015. The Augmented Dickey Fuller (ADF) test shows that all the variables are integrated of order one. Analysis of co-integration using Johansen test reveals two integrating equations. Then, the Fully modified Ordinary Least Squares estimation technique was used. The results indicate that tax revenues have positive effect on economic growth in Benin. However this relationship is improved on one hand by the private investment, suggesting a complementarity effect between tax revenues and private investment. On the other hand, the relationship is deteriorated by public investment which remains low in Benin. Other variables explaining economic growth in Benin include public and private investments, population growth rate, and trade. The main implication of these findings is that fiscal policy must promote private investments. Also, tax revenues must be directed to more productive investments. The level of public investments should be improved. This can be realized through the reduction of government's administrative expenditures. The findings also favour trade open policy. This can be done by lowering barriers between Benin and the rest of the world.

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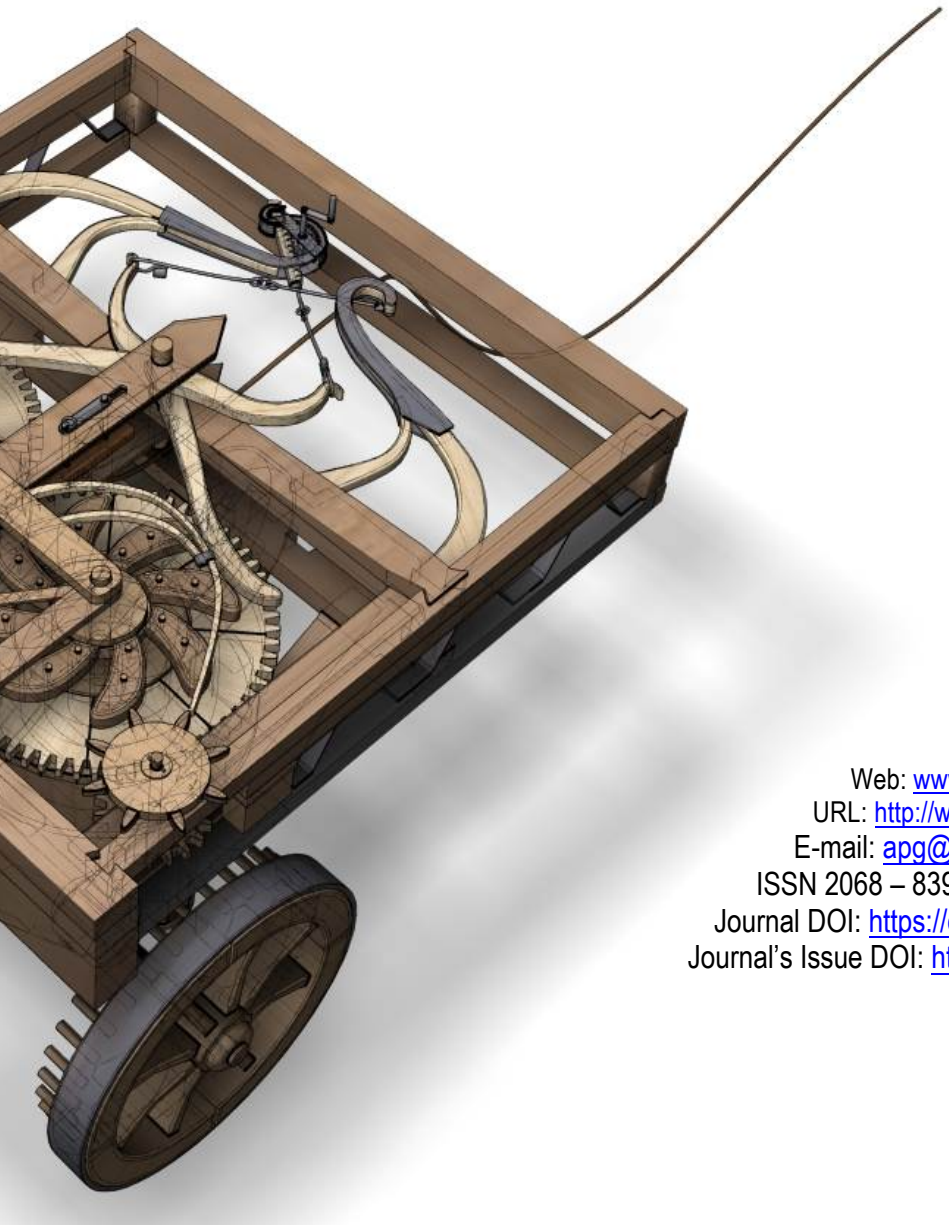

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ISSN 2068 – 8393
Journal DOI: https://doi.org/10.14505/jasf
Journal's Issue DOI: https://doi.org/10.14505/jasf.v8.2(16).00