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Abstract:

The aim of this article is to study empirically the nexus between tax revenue, domestic investment and economic growth in France, since it's never been done before. In addition, there were many problems and repercussions that criticized France's tax policy and its danger to the economic structure, which encourages us to do this research. To attempt this objective, annual data for the period 1972 - 2016 was tested by using correlation analysis and estimation based on vector error correction model. Our results suggest that in the long run there is a negative relationship between tax revenue, domestic investment and economic growth. It is seen that the strategy tax policy of France is not safe for domestic investment and economic growth. For this reason, immediate intervention should be encouraged to carry out the necessary measures before the situation becomes more disastrous.

JEL Classification: E62, H21, O47, O52

Keywords: Tax revenue, Domestic investment, Economic Growth, France

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[1] Former President of the University of Nice Sophia-Antipolis - France (2004 - 2012) and Director of the Higher Institute of Social Work in Nice - France.

I. Introduction

The application of fiscal taxes, in countries is fraught with several theoretical criticisms, since most taxes can change prices voluntarily or involuntarily. Some economists believe that taxes can disrupt the market, which leads to a reduction in economic efficiency (especially Austrian economists or inspired by the Austrian school, who recommend that taxes must be independent of income). Otherwise, liberal economists squeak on the fact that sustainable market efficiency is based on the incentive to innovate and undertake to make a strong profit. And when we submit heavily tax, profits will decrease this incentive, so the efficiency of the market will reduce. Otherwise, there are other critics who argue about labor taxation. Almost in most countries, the capital factor is taxed less than labor, the tax also encourages the substitution of capital for work (by moving workers by machinery), which indicates that taxes are a drain of unemployment. Finally, when taxes are heavier in a country than in neighboring countries, higher costs may make production in this country less competitive. Heavy taxes can also lead to capital flight.

According to the 2016 annual survey by the Organization for Economic Cooperation and Development (OECD), France is vice-champion of the world of tax pressure of all kinds2. This tax burden represents 45.28% of GDP, while the OECD average is below 35%. In France, tax revenues represented 34% in 1965, 41% in 1990 and 45% in 2016 (OECD figures). Despite these high levels, French government budgets are constantly in deficit. Otherwise, we must always remember that the French Revolution happened because of excessive taxation.

Does France want to fall again under this pressure or is it a new strategy for the advancement of the country?

Furthermore, such an empirical exercise has never been done in the context of France. In this research, we try to bridge these gaps by using function production include tax revenue, domestic investment and economic growth, and which are estimated by applying correlation analysis, co-integration analysis and vector error correction model for the period 1972 to 2016. The rest of the article is organized as follows. Section 2 instituted on a survey of literature. Section 3 elucidates the data

[2] Leading Denmark, world champion with a rate of 45.95% of GDP

characterization and methodological structure. Empirical results and analysis are taken into account in next coming Section 4. Section 5 terminates the study along with recommendations.

II. Literature Survey

Several empirical studies which investigated the relationship between domestic investment, tax revenue and economic growth, found that there is different, results and that this link is different from country to another. Skinner (1988) inspected the effect of corporate tax on the economic growth in 31 African countries. He found that corporate tax has negative impact on economic growth. Avila and Strauch (2008) concluded that taxation will negatively affect the economic growth. Their explication tells that when government imposes a higher tax rate, it will reduce the private investment and worsen the economic growth. Zhang and Ya (2011) studied the impact of the Carbon tax on economic growth in China. In their analysis, they used a panel data of 29 provinces from 1999 to 2008 and they adopted Generalized Least Squares estimation (GLS) to analyze this linkage. Empirical results show that the Carbon tax could stimulate economic growth of most eastern regions, while it can hinder some provinces' in middle and western areas. Bukie and Adejumo (2013) studied the impact of tax revenue on economic growth in Nigeria for the period 1970 to 2011 by including domestic investment, labor force, and foreign direct investment as control variables. By using the OLS method they have found that domestic investment and tax revenue have a positive effect on economic growth. Takumah (2014) examined the influence of tax revenue for economic growth in Ghana using quarterly data for the period 1986 to 2010 within the VAR framework. The result suggests that tax revenue exerted a positive and statistically significant effect on economic growth both in the long run and short-run implying that tax revenue enhances economic growth in Ghana. Ben Ammar and Ben Ammou (2016) examined the impact of fiscal rulers on economic growth in large countries and tax havens for the period 2000-2012. They used panel co-integration. The findings of this study suggest that the different fiscal policies of major countries and tax havens have had a long-term effect on the economic indicators between these groups of countries. In addition, this study concludes that the tax can be an important tool to recover the current recession or economic downturn and contribute to long-term growth in both groups of countries.

Tanchev (2016) examined the impact of the personal income tax on the economic growth in Bulgaria for the period 2004 - 2012 by using the OLS method. He found that the personal income tax has a positive effect on economic growth. In the case of South Eastern Europe countries, Bakari and Mabrouki (2017) found that domestic investment has a positive impact on economic growth for the period 2006 – 2016 by using static gravity model. Mbulawa (2017) explored the impact of economic infrastructure on long term economic growth in Botswana by using Vector Error Correction Model and Ordinary Least Squares during the period of 1985 – 2015. Empirical results show that domestic investment influence positively economic growth. Bakari (2017) studied the nexus between domestic investment and economic growth in Egypt for the period 1965 – 2015. He used co-integration analysis and vector error correction model. Empirical results show that domestic investment has a negative effect on economic growth in the long run. Hamzaoui and Bousselhami (2017) inspected the nexus between tax revenue and economic growth in Morocco. After recalculating a new series of public capital and private capital and based on simultaneous equations model, has been estimated with data covering the period 1980-2015. The idea is to measure the effect of taxation on economic growth through its impact on public capital. The results find that the relationship between the two variables is positive. The householders can finance the public capital by taxes. And the public capital improves the economic growth. Takumah and Iyke (2017) explored the causal influence of tax revenue on economic growth in Ghana by using the Toda-Yamamoto test instead of the conventional Granger causality test to avoid pre-testing bias. They used a quarterly dataset which spans the period 1986 - 2014. This finding agrees that taxation can influence economic growth.

III. Data, methodology and model specification

1) Data

To inspect the relationship among tax revenue, domestic investment and economic growth in France, we will use a time series database that will cover the period 1972 - 2016, and take and collect from annual statistical reports of World Bank. The succinct depiction of variables is given as below in Table 1

Table 1: Description of variables

No	Variable	Description	Source
1	Y	Gross domestic product (constant US$)	The World Bank
2	DI	Gross fixed capital formation (constant US$)	The World Bank
3	T	Tax revenue (constant US$)	The World Bank

2) Methodology

To search the relationship among tax revenue, domestic investment and economic growth in France, we will use correlation analysis and an estimation base on the Sims Model. The empirical methodology of this analysis is as follows:

- Correlation analysis by using test correlation of Pearson.
- Determination of the order of integration of all variables by using Augmented Dickey Fuller test.
- Determination the number of lags by using a set of information selection criteria such as AIC, SC and HQ.
- Use the Johansen Test to verify the co-integration between variables.
- Estimation the Sims Model (VAR if there is no co-integration; VECM if there is co-integration).
- Applying stability test to verify the robustness and credibility of the model and the empirical results.

3) Model specification

The augmented production function including domestic investment, tax revenue and economic growth is expressed as:

$$\mathbf{Y} = \mathbf{F}(\mathbf{DI}, \mathbf{T})$$

Where Y, DI and T depict respectively: Gross domestic product (constant US$); Gross fixed capital formation (constant US$) and Tax revenue (constant US$).

The function can also be represented in a log-linear econometric format thus:

$$\mathbf{Log}(\mathbf{Y}) = \boldsymbol{\beta_0} + \boldsymbol{\beta_1}\,\mathbf{Log}(\mathbf{DI})_t + \boldsymbol{\beta_2}\,\mathbf{Log}(\mathbf{T})_t + \boldsymbol{\varepsilon_t}$$

Where: β_0 : The constant term; β_1: coefficient of variable (Domestic Investment); β_2: coefficient of variables (Tax Revenue); t: The time trend. ε : The random error term assumed to be normally, identically and independently distributed.

IV. Empirical Analysis

1) Correlation Analysis

This Pearson correlation coefficient 'r' makes it possible to detect the presence or absence of a linear relationship between two continuous quantitative characters. It can be shown that this coefficient varies between -1 and +1. His interpretation is as follows:

- ✓ If 'r' is close to 0, there is no linear relationship between X and Y;
- ✓ If 'r' is close to -1, there is a strong negative linear relationship between X and Y;
- ✓ If 'r' is close to 1, there is a strong positive linear relationship between X and Y;

Table 2: Correlation analysis: Pearson Correlation Test

	Y	**DI**	**T**
Y	**1**		
DI	0.9826	**1**	
T	0.9881	0.9741	**1**

According to results in the table 1, it is seen that the correlation coefficient is close to 1 between all variables. This means that there is a strong positive linear relationship between:

- ✓ Y and DI (a 1% increase in domestic investment leads to a 0.9826% increase in economic growth).
- ✓ Y and T (a 1% increase in tax revenue leads to a 0.9881% increase in economic growth).
- ✓ DI and T (a 1% increase in tax revenue leads to a 0.9741% increase in domestic investment).

2) ADF Test

ADF Test (Augmented Dickey-Fuller Test) is a statistical test that aims to know if a time series is stationary that is to say if its statistical properties vary or not in time.

Table 3: Augmented Dickey-Fuller Test

Unit Root Test	ADF	
	Constant	***Constant, Linear Trend***
Y	(2.010600)	(0.801363)
	[5.207358]***	[5.664935]***
DI	(0.468829)	(3.417813)
	[4.427223]***	[4.354191]***
T	(1.304607)	(1.749157)
	[7.384613]***	[7.532659]***

*****; ** and * denote significances at 1%; 5% and 10% levels respectively**
( ) denotes stationarity in level
[ ] denotes stationarity in first difference

The results of the ADF test are shown in Table 2, it is clear that all the variables are integrated in order 1.

3) Lag order selection

The verification of the number of optimal delays that will be applied in our model estimation is very important. To achieve this goal, we will base on a set of selection criteria that are FPE, AIC, SC, and HQ.

Table 3: Lag Order Selection Criteria

VAR Lag Order Selection Criteria						
Lag	***Log L***	***LR***	***FPE***	***AIC***	***SC***	***HQ***
0	307.9009	NA	6.97e-11	-14.87321	-14.74783	-14.82756
1	326.5768	33.70776*	4.36e-11*	-15.34521*	-14.84368*	-15.16258*
2	333.6444	11.72183	4.83e-11	-15.25095	-14.37326	-14.93134
3	338.5339	7.393850	6.02e-11	-15.05043	-13.79660	-14.59386

*** 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

The results of Table 3 show us that the number of lags has been equal to 1 since the criteria FPE, AIC, SC and HQ select that the number of lags is equal to 1.

4) Co-integration Analysis

JOHANSEN's co-integration test sheds light on the number of co-integration relationships and its functional form by following different criteria. In our case we will apply the criterion of the trace.

Table 4: Johansen Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	***Eigenvalue***	***Trace Statistic***	***0.05 Critical Value***	***Prob.*****
None *	0.446650	45.83711	29.79707	0.0003
At most 1 *	0.235667	20.98297	15.49471	0.0067
At most 2 *	0.206136	9.695400	3.841466	0.0018

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
*** denotes rejection of the hypothesis at the 0.05 level**
****MacKinnon-Haug-Michelis (1999) p-values**

There are three co-integration relationships, so the error-correction model can be retained. Otherwise, the equation of long-term equilibrium is written as follows:

$$\text{Log (Y)} = 0.065085 - 1.213073\ \text{Log (DI)} - 1.046442\ \text{Log (T)}$$

According to the co-integrating relation of the long-run equilibrium, we can conclude that there exists:

- ✓ negative relationship between DI and Y;
- ✓ negative relationship between T and Y;
- ✓ negative relationship between T and DI;

The next step consisted to test the significance of the long-term relationship to justify its robustness. To attempt this goal, we will apply the Vector Error Correction Model (VECM).

5) Estimation of VECM

The purpose of the vector error correction model is to determine the causal links between the different variables, whether in the long-term or in the short-term

Table 5: Estimation of VECM (Results of causality in Long run and short run)

	Y	DI	T
Y	-	(0.8814)	(0.9074)
DI	(0.0241)**	-	(0.0419)**
T	(0.2754)	(0.2623)	-
ECT	[-0.156294]***	[-0.319578]***	[-0.424885]***

*****; ** and * indicate significance at 1%, 5% and 10%, respectively**

( ) denotes the value of the probability of the variables in the short term

[ ] denotes the significance of long-term co-integration equations

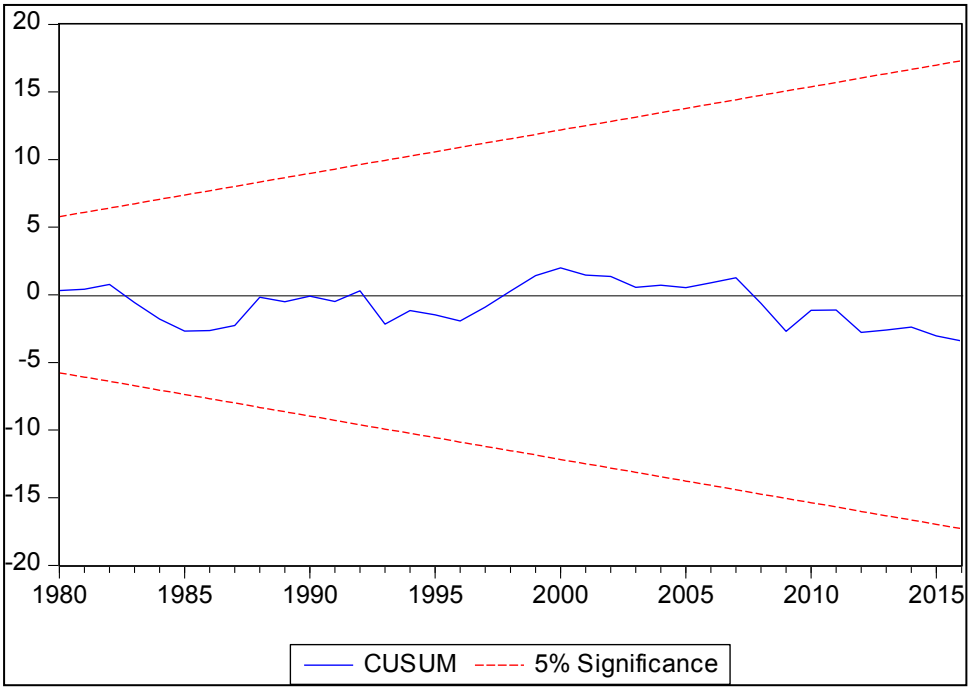
The estimation of the vector error correction model shows the following results:

- ✓ The existence of a negative relationship between Y, DI and T in the long term;
  - negative relationship of bidirectional causality between Y and DI
  - negative relationship of bidirectional causality between Y and T
  - Negative relationship of bidirectional causality between DI and T
- ✓ DI causes Y and T in the short run;
  - Positive relationship of unidirectional causality from DI to Y
  - Positive relationship of unidirectional causality from DI to T

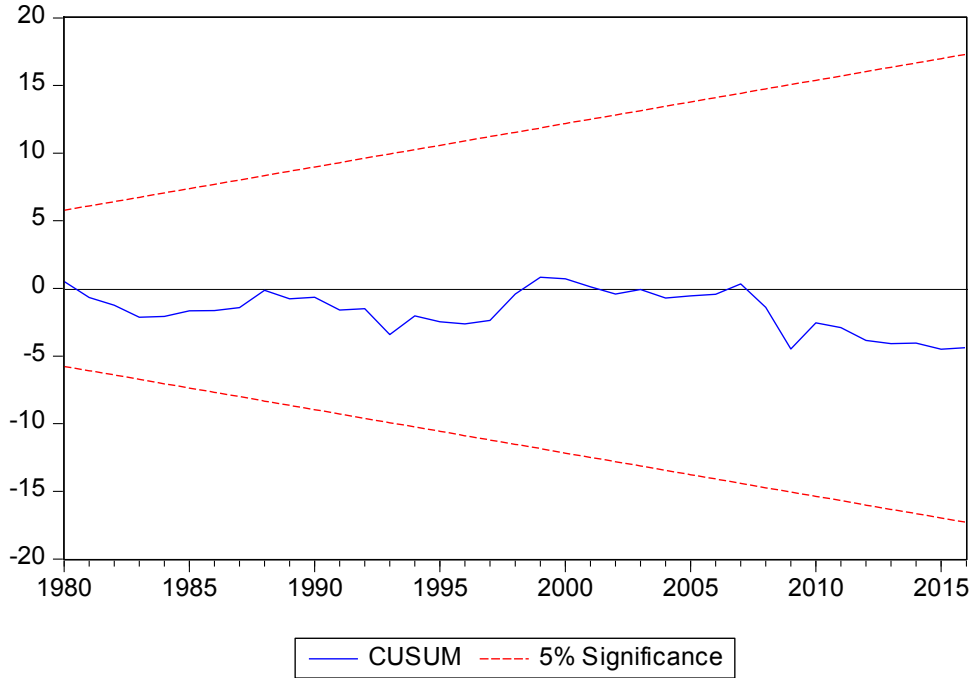
6) Stability Model

Finally we will apply to use the test CUSUM, this test makes it possible to study the stability of the model estimated over time. Since we have estimated three co-integrated equations, we will apply the CUSUM test on these three equations.

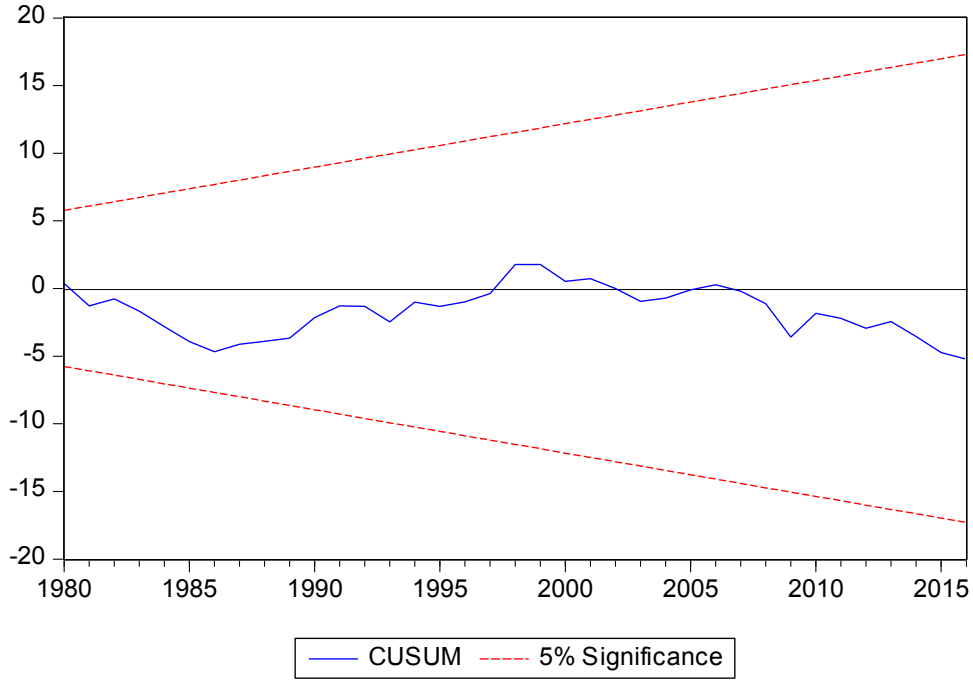
a- Model Y



b- Model DI



c- Model T



The test result of the stability VAR (CUSUM Test) show that the Modulus of all roots is less than unity and lie within the unit circle. Accordingly we can conclude that our model the estimated VAR is stable and stationary.

V. Conclusion

In this Study, we inspected the direct and the indirect relationship among tax revenue, domestic investment and economic growth for France in the period 1972 – 2016. To attempt this objective, we use correlation analysis and estimation based on vector error correction model. Empirical results confirm that domestic investment, tax revenue and economic growth are positively correlated with each other. In addition, the results of the estimation of Sims model prove that the Johansen test show that variables are negatively co-integrated in the long term. Our results suggest that in the long run (i) there is a negative bi-directional causal relationship between tax revenue and economic growth; (ii) there is a negative bi-directional causal relationship between domestic investment and economic growth; and (iii) there is a negative bidirectional causal relationship between tax revenue and economic growth. Also our results suggest that in the short run (1) there is a positive uni-directional causal relationship from domestic investment to economic growth; and (2) there is a positive uni-directional causal relationship from domestic investment to tax revenue.

This can be explained by some reasons and which they are: the increase in the value of taxes, which has led to the escape of domestic and foreign investors to other countries, especially developing countries. Similarly, developing countries are characterized by low taxes and in some cases the absence, thanks to a large number of agreements aimed at reducing the level of unemployment and displacing the economy in developing countries. In addition, these countries are characterized by low labor costs and a low fee paid to them. All of these encourage investors to close their projects in France and to invest in other countries. France is characterized by the complexity and instability of the legislative and regulatory environment, by a lack of flexibility of labor law, by complex, long and uncertain procedures in restructuring, by higher costs than elsewhere and, more generally, by a cultural mistrust of the market economy.

We cannot ignore that France is a developed country. It is also characterized by a strong economy and innovative investments that have helped it overcome in many crises and create an economic force that is one of the best forces in the world. But France should look for new strategies to improve the relationship between tax revenue, domestic investment and economic growth through administrative simplification and fiscal stability to boost investment and encourage investors to develop their investments.

References:

Avila, D. R., and Strauch, R. (2008). “Public finances and long term growth in Eu-rope: Evidence from a panel data analysis”. *European Journal of Political Economy,* 24, 172-191.

Bakari, S (2017). “The Relationship between Export, Import, Domestic Investment and Economic Growth in Egypt: Empirical Analysis.” *EuroEconomica*. Issue 2(36)/2017.

Bakari, S and Mabrouki, M (2017). "The Effect of Agricultural Exports on Economic Growth in South-Eastern Europe: An Empirical Investigation Using Panel Data". *Journal of Smart Economic Growth.* Volume 2, Number 4, Year 2017.

Ben Ammar, F and Ben Ammou Saloua (2016). "Impact des recettes fiscales sur la croissance économique (Cas des grands pays et des paradis fiscaux)". *International Journal of Business & Economic Strategy* (IJBES), Vol.4, 2016 - pp. 1-6.

Bukie, H.O. and Adejumo, T (2013). "The effect of tax revenue on economic growth in Nigeria". *International Journal of Humanities and Social Invention,* 2(6): 16 – 26.

Dickey, D. A. and W. A. Fuller (1979). Distribution of Estimators of Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association,* 74, 427-31.

Dickey, D. and Fuller W. (1981). Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root. *Econometrica*, 49, 1057-1072.

Hamzaoui, M and Bousselhami, N (2017). "Impact De La Fiscalite Sur La Croissance Economique Du Maroc". *European Scientific Journal* February 2017 edition Vol.13, No.4 ISSN: 1857 – 7881 (Print) e - ISSN 1857- 7431. http://dx.doi.org/10.19044/esj.2017.v13n4p104

Johansen, S and Juselius, K (1990). "Maximum likelihood estimation and inference on cointegration, with applications to the demand for money." *Oxford Bulletin of Economics and Statistics,* 52, 169 – 210.

Johansen, S. (1988). "Statistical analysis of cointegration vectors." *Journal of Economic Dynamics and Control*, 12 (2–3): 231 – 254.

Johansen, S. (1991). "Estimation and hypothesis testing of cointegration vectors in gaussian vector autoregressive models", *Econometrica*, 59, 1551 – 1580.

Mbulawa, S. (2017). "The impact of economic infrastructure on long term economic growth in Botswana." *Journal of Smart Economic Growth.* Volume 2, Number 1, Year 2017.

Sims, C (1980), "Macroeconomics and Reality", *Econometrica*, 48, pp. 1-48.

Sims, C (1996), "Macroeconomics and Methodology", *Journal of Economic Perspectives*, vol. 10 (1), pp. 105-120.

Skinner, J. (1988). "Taxation and output growth in Africa". *International Economics Department,* The World Bank, Working Paper Series 73.

Takumah, W. (2014). "Tax Revenue and Economic Growth in Ghana: A Cointegration Approach". *MPRA Paper* No. 58532. Retrieved from https://mpra.ub.uni-muenchen.de/58532/1/MPRA_paper_58532.pdf

Takumah, W. and Iyke, B. N. (2017). "The links between economic growth and tax revenue in Ghana: an empirical investigation". *International Journal of Sustainable Economy*, 9(1), 34–55.

Tanchev, S. (2016). "The role of the proportional income tax on economic growth of Bulgaria". *Ikonomicheski Izsledvania*, 25(4), 66–77.

Zhang, Z., Li, Y., 2011. "The impact of carbon tax on economic growth in China". *Energy Procedia* 5, 1757–1761.