KNOWLEDGE – International Journal
Vol. 28.1
December, 2018

EMPIRICAL ANALYSIS OF EFFECTS OF INCOME TAX ON ECONOMIC GROWTH OF WESTERN BALKAN COUNTRIES

Luljeta Sadiku
Faculty of Economics and Administrative Sciences, International Balkan University- Skopje
l.sadiku@ibu.edu.mk
Merale Fetahi-Vehapi
Faculty of Economy, University of Tetovo, merale_fetahu@yahoo.com
Murat Sadiku
Faculty of Business and Economics, South East European University,m.sadiku@seeu.edu.mk

Abstract: The existing theoretical literature advocates that tax policy plays a vital role on the economic development, principally policy that include a reduction in the rate of taxation is a dominant incentive of economic growth. In this regard, almost all Western Balkan countries cut the income tax and move to a flat tax rate in order to stimulate the employment and investment which in turn will spur the economic growth. Thus, the purpose of this research paper is to empirically examine how changes of income tax affect the economic growth of Western Balkan countries. For analysing this issue, panel econometric models are employed using yearly data for the time period 2005-2016. The estimation results reveal that the personal income tax has positive and significant impact on growth. While corporate tax has negative impact on growth in almost all models, but the coefficient is statistically insignificant. This implies that the current corporate tax rates couldn't endow with sustainable economic growth in the sample countries.
Keywords: Tax changes, economic growth, effects, long run, Western Balkan

I. INTRODUCTION

The existing literature makes available persuasive arguments of prominence of tax policy and its effects on the economic development. Accordingly, in the last two decades, this topic has become a subject of much debate, both in governments' policy and research community. The theoretical literature on this issue reveals that a high taxation burden is the greatest obstacle to economic growth, whereas policies that include the reduction in the tax rates and a broadening of tax base can stimulate growth (Johnson et a, (2008); OECD,2010). The idea is that lower tax rates will give people more after-tax income that could be used to buy more goods and services. This is a demand-side argument to support a tax reduction as an expansionary fiscal stimulus. Further, reduced tax rates could boost saving and investment, which would increase the productive capacity of the economy and productivity. In this regard, Western Balkan countries undertook substantial tax reforms and almost all countries cut the income tax and some of them move to a flat tax rate in order to stimulate the investment and employment, which in turn will spur the economic growth. Accordingly, the intention of this research paper is to empirically examine how changes of income tax affected the economic growth of the sample countries in the last 10 years.

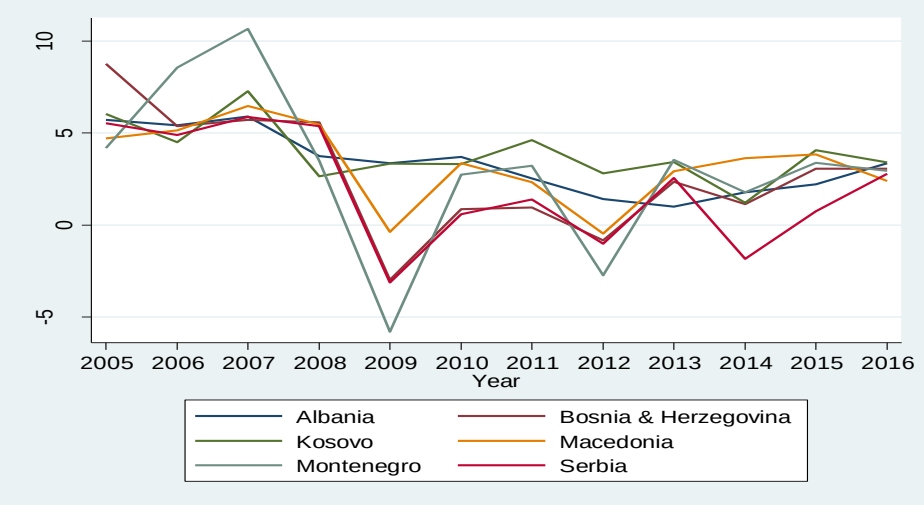
While there are numerous studies analysing the effects of tax policy and structure on the economic development for developed and OECD countries, the empirical evidences for cross sectional panel data for developing countries are limited. Moreover, the available empirical results reveal significant negative effects of taxes on economic growth, even after controlling for various other factors. For instance, Padovano and Galli (2002) find that marginal effective tax rates and tax progressivity have a negative influence on economic growth, whereas average tax rates don't affect output dynamics. Also, Lee and Gordon (2005) for a sample of 70 developed and developing countries from 1970- 1997, find that statutory corporate tax rates are significantly negatively correlated with cross-sectional differences in average economic growth rates, controlling for various other determinants of economic growth. They argue that the top statutory corporate income tax rates mostly affect economic growth. From their estimation, they found that only the CIT rate had a significant negative impact on economic growth in all their regressions by controlling the endogeneity of tax measures. Conversely, the PIT rate and its progressivity did not significantly affect economic growth. Similarly, Arnold (2008) supports the results of Lee and Gordon (2005). He found that an increase of CIT and PIT rates could reduce the economic performance of a country.

The paper is structured in five sections. Thus, in the next section is given a brief on the income tax rates of Western Balkan countries, the third section explains the data and methodology, the fourth part provides the empirical results and lastly some conclusions and policy implications of the paper are given.

2. ECONOMIC GROWTH AND INCOME TAXES IN WESTERN BALKAN COUNTRIES

In the period of 2005-2008, the average annual growth rate of Western Balkan countries was around 6% that was higher than that of the EU countries. However, the global financial crisis affected the economy of the region, causing severe negative consequences such that, increase in public debt levels, decline in European and international market demand for products and raw materials (lower exports), decrease of foreign direct investment (FDI), and a decline of remittance inflows. As a result of above repercussions, in 2009 year, all countries of Western Balkan except Albania fell into recession (see Chart 1 below). Even Albania had a decline of economic output, although was less impacted compare to other countries of the region. The economies slowly started to recover in 2010 and 2011 year, as real GDP grew by an average of 2.2 and 2.1 percent, respectively. However, the negative effects of the euro zone debt crisis were felt in 2012 year, as the economies of countries fell again in recession. Almost a decade after the global financial crisis, the pre-crisis growth levels are not still restored. Based on Western Balkan Regular Economic Report (World Bank, 2017), regional growth in 2016 was 2.9 percent, whereas in 2017 year it was estimated to be 2.4 percent, and it is projected to rise to 3.3 percent in 2018 and 3.6 percent in 2019.

Chart 1. Economic growth of Western Balkan Countries



Source: World Development Indicators, World Bank

The Western Balkan countries have experienced major tax reforms over the past two decades. The tax reforms were undertaken with the aim to boost investment and employment, so most of countries have adopted the flat tax rates on income. The comparison of corporate income tax (CIT) and personal income taxes (PIT) of Western Balkan countries is provided in Table 1 below. Observing at the piece of evidence, the countries of the region have lower income tax rates compare to EU member countries' tax rates.

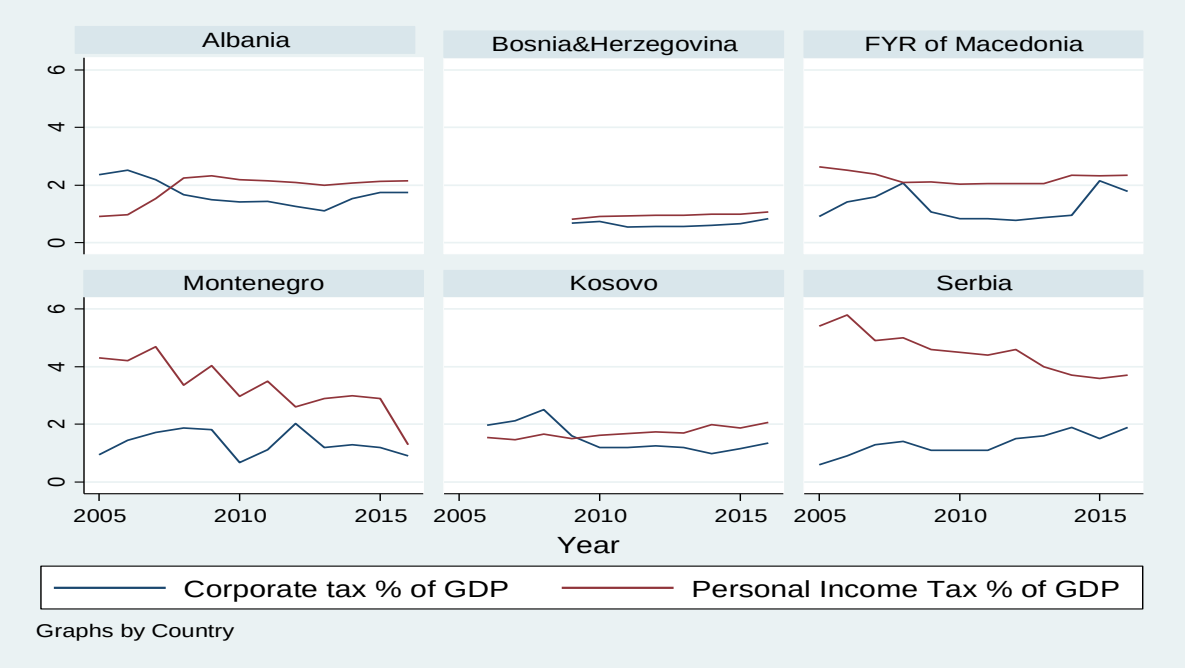
Table 1. Personal Income taxes and corporate income tax of Western Balkan countries

Country	**Personal Income Tax**	**Corporate Income Tax**
Albania	Preliminary 6 rates - from 5% to 30%. From 1 January 2014, gross *monthly* salaries and other remuneration in connection with employment are taxable at the following progressive rates; 0% (of the amount under Albanian Lek (ALL) 30,000),-13% (of the amount over ALL 30,000),-ALL 13,000 plus 23% of the amount over ALL 130,000.	Before 2014, the rate was 10%.
Bosnia&Herzegovina	10%	10%
Kosovo	2002: 4 rates 0%, 5%, 10% and 20% Since 1 January 2009 reduced progressive rates 0%, 4%, 8% and 10%	2002: 20% rates for big companies and of course for small business. Since 1 January 2009, 10% for companies with gross income over EUR 50,000(for companies

		with income below EUR 50,000, the system is scheduler, although they may opt for a 10% rate)
FYR of Macedonia	Earlier 2 rates: 15% and 18%, 2002; rates from 0% to 38%; then there were progressive rates 15%,18% and 24%; from 1 January 2007 to 1 January 2008 it was 12%, whilst from 1 January 2008 is10% flat rate .	Earlier 30%; then 15%; 2007 it was reduced to 12%; in 2008 it was reduced to 10% .
Serbia	progressive; 10%, 15%, 20%	Preliminarily: 20% -30%; 2003: the rate was 14%; since 1 January 2013 corporate income tax is levied at a rate of 15%.
Montenegro	Preliminarily the fixed rate 14 % of tax on earned income: from other income the rate of 10%, 15% and 20%. Currently standard rate 9%	Preliminarily rates: 20%, 30%; 2003: the rate 14%. Currently 9% flat rate

Source: Peci, B. (2016) and Trading economics

Chart 2. Personal Income tax and Corporate tax as % of GDP of Western Balkan countries.



Source: Countries' Ministries of Finance and author's calculation as % of GDP

Serbia and Montenegro are countries with higher portion concerning the personal income tax as % of GDP, although the trend is decreasing, especially in Montenegro (see Chart 2). While the countries with the lower personal tax as % of GDP are Bosnia and Herzegovina and Kosovo, whereas Albania and Macedonia are in the middle of the pack with quite similar level. Regarding the corporate tax as % of GDP, the situation is again shoddier in Bosnia and Herzegovina and Kosovo and somewhat similar at the other sample countries.

3. METHODOLOGY AND DATA

For examining the impact of income taxes on economic growth of the Western Balkan countries, a general standard model is used in the following form:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 Z_i + \varepsilon_{it} \qquad (1)$$

Where Y represents the real output for country i and time t, X is a vector of control variables that include, in our case, the lagged GDP per capita, personal income tax as % of GDP, corporate tax as % of GDP, gross fixed capital formation as % of GDP, population growth rate, and trade openness. Whereas Z_i is an unobserved variable that varies from one country to the next but does not change over time. We want to estimate β_1, the effect on Y of X holding constant the unobserved country characteristics Z. Because Z_i varies from one country to the next but is constant over time the real output regression model can be interpreted as having *n* intercepts, one for each country and ε_{it} is the stochastic term.

To estimate the above panel regression model, four alternative methods are used. First, the Pooled Least Squares (OLS) model, which fundamentally depends on minimizing the sum of squared residuals, is based on the assumption that both intercept and coefficient are constant over time and cross section, and statistical noise captures disturbances over time and cross section. Second, the Fixed Effects model (FEM), also referred to as the "Least-Squares Dummy Variable (LSDV) model", estimates the intercept as coefficient of dummy variables. This model allows intercept to vary for each cross-section and thus account for the individual effect. Third, the Random Effects model (REM), treats the intercepts as random variables rather than fixed constants. The intercepts are assumed to be independent from the error term and also mutually independent. This study also provides Hausman test to decide between Fixed Effect model and Random Effect model. The null hypothesis underlying this test is that the FEM and REM estimators do not differ substantially. If the null hypothesis is rejected, REM is not appropriate and it is may be better to use FEM, in which case statistical inferences will be conditional on the ε_{it} in the sample. Specifically, if it is assumed that ε_{it} and the *X's* (explanatory variables) are uncorrelated, REM may be appropriate, whereas if ε_{it} and the *X's* are correlated, FEM may be appropriate (Gujarati, 2003). Explicitly, let $\alpha_i = \beta_0 + \beta_2 Z_i$ then the equation (1) becomes:

$$Y_{it} = \beta_1 X_{it} + \alpha_i + \varepsilon_{it} \quad (2)$$

This equation represents the fixed effects regression model by which we estimate the fixed effects on real output, where α_i (i=1....n) is the unknown intercept for each country.
While the random effects model has the form:

$$Y_{it} = X_{it}\beta + \alpha_i + u_{it} + \varepsilon_{it} \quad (3)$$

Where u_{it} is the between-entity (country) error; ε_{it} is the within-entity (country) error.

Finally, the Hausman Taylor IV estimator can be considered to be an estimator in between the fixed and random effects approach. The crucial difference between the random effects model and the fixed effects model is based on assumptions about the correlation between the individual-specific effects and the set of regressors. However, these assumptions do not consider that if the individual effects are related to the regressors, estimation of time-invariant explanatory variables is not possible. To overcome this, Hausman and Taylor (1981) introduced a model where some of the explanatory variables are related to the α_i , while others are not. In particular, they consider a model of the form:

$$y_{it} = X_{it}\beta + Z_i y + \mu_{it} + v_{it} \quad (4)$$

Where the $\boldsymbol{Z_i}$ are time invariant covariates. In this formulation, all individual effects that are denoted as $\boldsymbol{Z_i}$ are oserved. Unobservable individual effects are are contained in the random term μ_i. Hausman and Taylor suggested to split X and Z into two sets of variables: $X = [X_1;\ X_2]$ and $Z = [Z_1;\ Z_2]$, X_1 is $n \times k_1$; X_2 is $n \times k_2$; Z is $n \times g_1$; Z_2 is $n \times g_2$ and $n = NT$. The model then is:

$$y_{it} = X_{1it}\beta_1 + X_{2it}\beta_2 + Z_{1i}y_1 + Z_{2i}y_2 + \mu_i + v_{it} \quad (5)$$

The distinguishing feature of this model is found in the assumptions on the correlation between the individual-specific effect, μ_i , and the sets of time varying and time invariant regressors.

3.1 The data

This study is an empirical study using secondary data. The annual data from 2005 to 2016 of six Western Balkan countries namely Albania, Bosnia and Herzegovina, FYR of Macedonia, Kosovo, Montenegro and Serbia, were collected from World Development Indicator (WDI) provided by the World Bank. Data for personal income taxes (PIT) and corporate income taxes (CIT) were provided from countries national statistics (reports of Ministries of finances, respectively). The time span of the analysis is limited because of the lack of the data on income taxes for the first decade of transition. The summary statistics of the variables used in the empirical research are presented in Table 2. Over the period of analysis, the average of GDP per capita growth of the region has been 3.25 percent, whereas the average personal income tax to GDP level is 2.54 percent and corporate tax to GDP is 1.34%. These averages exhibit moderate discrepancies between WB countries.

Table 2. Summary statistics

Variable	Mean	Std.Dev.	Min	Max	Observations
GDPCG	3.253759	2.829118	-5.859094	10.50518	72
PIT	2.538231	1.266552	0.815332	5..8	70
CIT	1.337721	0.5056333	0.5400266	2.522985	70
GFCF	24.19808	5.335294	16.96215	38.97967	72
TRADE	90.77964	16.30123	60.44544	133.4789	70
POP	-0.123877	0.5135868	-1.19124	1.041533	72

Source: Authors' calculations

4.. EMPIRICAL FINDINGS

In this section are presented estimates of econometric models, ie "pooled OLS," "Fixed Effects", "Random Effects", and the results of Hausman Taylor IV model. As dependent variable we take GDP per capita growth, while as independent variables beside the variables of personal income taxes as % of GDP and corporate taxes as % of GDP, we consider GDP per capita with one time lag (lag GDPC) in order to control the convergence 'steady-state' predicted by neoclassical growth models (see Solow, 1956; Mankiw et al. 1992), as well as other determinants of economic growth such as, trade openness (TRADE) that corresponds to the ratio of the total value of exports and imports to GDP; gross fixed capital formation (GFCF) as % of GDP to reflect the impact of physical capital accumulation; and population growth rate (POP). In Table 3 below are summarized the obtained results of all models.

Table 3. Regression results

Variables	Pooled OLS	Fixed Effects	Random Effects	Hausman Taylor IV
ln_GDPC	-8.445618***	-10.59308***	-8.456688***	-8.15459***
L1.	(1.287811)	(1.683322)	(1.294891)	(1.329121)
PIT	0.5679123**	0.2677274	0.5579024**	0.515764**
	(0.24172)	(0.5252281)	(0.229508)	(0.2419887)
CIT	-0.1835431	-0.3552603	-0.1827686	-0.3216385
	(0.594153)	(0.6545902)	(0.594153)	(1.030762)
GFCF	0 .093252*	0.0619134	0 .0925528*	0.1024072
	(0.057415)	(0.0677646)	(0.05665)	(0.0659215)
TRADE	0 .085642***	0.0784437***	0 .084778***	0.083721***
	(0.0169222)	(0.0277746)	(0.017342)	(0.017764)
POP	-1.163211**	-1.608036*	-1.162988**	-1.225044**
	(0.49415)	(0.8391264)	(0.484176)	(0.505796)
ID_country	-	-	-	0.03152 (0.04011)
Constant	63.01223***	83.15268***	62.91749***	60.52914***
	(11.0052)	(15.41219)	(10.7724)	(11.12252)
Observations	64	64	64	64
R-squared	0.5827	0.5248	0.5967	-
F	13.71	13.00	-	-
Chi2	-	-	76.8	82.6
Comand	Regress	Xtreg	Xtreg	Xthtaylor
Number of countries	6	6	6	6

Note: The values in parentheses represent standard errors of coefficients, and notations ***; **; * indicate statistical significance of the regression coefficients of 1%, 5%, 10%, respectively
Source: Authors' calculations

As a result of individual unobservable heterogeneity, linear regression method, respectively pooled OLS estimates show bias and cannot be regarded as consistent, so therefore the results of this approach should be taken with caution. Consequently, we have estimated the FEM and REM models, where through the Hausman[41] test we determined that the REM model is more preferred and appropriate then FEM. Moreover, given the endogeneity

[41] To decide between fixed or random effects we can run a Hausman test where the null hypothesis is that the preferred model is random effects vs. the alternative hypothesis the fixed effects (see Green, 2008, chapter 9). It tests whether the errors (u_i) are correlated with the regressors, the null hypothesis suggests that they are not correlated.

problems that appear especially in growth models, we further applied the method of Hausman-Taylor IV, as a method that avoids these problems. After running it we performed again a second Hausman test to compare the models REM and Hausman Taylor IV and came to the conclusion that Hausman Taylor IV model is more efficient model and the empirical results of this model are more robust than the results of the previous models. Observing at all the results in Table 3, it can be confirmed the existence of convergence course. The expected negative coefficient for the initial real per capita GDP is attained and in all cases the coefficient is statistically significant at 1% level of significance, revealing that WB countries converge for their own steady state in the analysed time period. Also in all models we can notice that there is a positive relationship between personal income tax and economic growth, but the coefficient is not statistically significant in the fixed effects model (FEM). However, the regression results of Hausman Taylor IV model that somehow mitigates the problem of endogenity, reveal that there is a strong positive linkage between economic growth and personal income taxes. It suggests that for every 1 unit increase of personal taxes as % of GDP, GDP per capita will increase approximately by 0.5 units over time. The empirical analysis conducted by Xing (2011; 2012) reveals that personal income taxes spur more the economic growth, compare to corporate taxes, which findings are in line with the results of this research. Also, Shinohara (2012) analyzed this issue for OECD countries and find that personal income tax has a positive impact on economic growth, whereas corporate income tax has a negative effect. However there are other studies that obtain negative evidences for both types of taxes (see: Angelopoulos and Kammas, 2006; Mendoza et al.1995; 1997). The coefficient of gross fixed capital formation (GFCF) as % of GDP is with positive sign but statistically insignificant in fixed and Hausman Taylor models, whereas at 10% level of significance in the pooled OLS and random effects models. This result reveals that the region is less equipped with capital in relation to population and resources. The region needs to raise the saving rate in order to reach the Golden Rule steady state, that requires a fall in consumption and a rise in capital investment, so over time higher investment causes the capital stock to rise and the real output to enhance. On the other side, the coefficient of population growth rate is negative at the 5% level of significance, as predicted by Solow growth model, that an increase in the rate of population growth reduces the steady-state level of capital. Regarding the coefficient of trade openness, it is with positive sign and statistically significant at 5% level, disclosing that trade openness in an important determinant of growth of Western Balkan countries. In addition, the postestimation diagnostic tests are performed for all models. The Lagram-Multiplier test for serial correlation suggested that there is not serial correlation, as the null hypothesis cannot be rejected. Also, the test for cross-sectional dependence/contenporaneous correlation is performed using the Pasaran CD test, that examines whether the residuals are correlated across entities. Again the null hypothesis cannot be rejected, meaning that the residuals are not correlated. Although the Hausman Taylor IV model performs well, the results should be interpreted with caution. The analysis has its limitations and shortcomings; first, the total number of observations is relatively small for a panel regression analysis; second, the problem of endogenity is not completely avoided. A dynamic panel regression analysis may be a comprehensive analysis by incorporating instrumental variables into the model.

5. CONCLUSIONS

The main purpose of this study was to empirically analyse the effects of income taxes on the economic growth of the Western Balkan countries (Albania, Bosnia and Herzegovina, Kosovo, Macedonia, Serbia and Montenegro). To accomplish this goal we performed regression models based on panel data (from 2005-2016), such as pooled OLS model, fixed effects model, random effects model and the model of Hausman Taylor IV. The results of all types of models show that there is a positive and statistically significant relationship between personal income taxes and economic growth in the sample countries, whereas a negative insignificant relationship with corporate taxes. Based on the results of Hausman test the most appropriate model for this analysis was selected the Hausman Taylor IV model. It suggests that for every 1 unit increase of personal taxes as % of GDP, GDP per capita will increase approximately by 0.5 units over time.

Although the Hausman Taylor IV model performs well, the results should be taken with caution. The analysis has its limitations and shortcomings; first, the total number of observations is relatively small for a panel regression analysis; second, the problem of endogenity is not completely avoided. A dynamic panel regression analysis may be a comprehensive analysis by incorporating instrumental variables into the model.

REFERENCES

[1] Arnold, J. (2008). Do Tax Structures Affect Aggregate Economic Growth?: Empirical Evidence from a Panel of OECD Countries. OECD Economics Department Working Papers, No 643

[2] Angelopoulos, G. and Kammas, P. (2006). "Tax Spending Policies and Economic Growth:Theoretical predictions and evidence from the OECD". European Journal of Political Economy". Vol 23. pp 1615-1660

[3] Barro, R. J. (1991). Economic Growth in a Cross Section of Countries. The Quarterly Journal ofEconomics, 106(2), 407-443.
[4] Green H.W.(2008), Econometric Analysis. 6th edition., Upple Saddle River, N. J. :Prentice Hall.
[5] Lee, Y., & Gordon, R.H. (2005). Tax Structure and Economic Growth. Journal of Public Economics 89(5-6), 1027-1043. doi: 10.1016/j.jpubeco.2004.07.002
[6] OECD, (2010). "Tax Policy Reform and Economic Growth". OECD Tax Policy Studies, No.20.
[7] Padovano, F., & Galli, E. (2002). Comparing the Growth Effects of Marginal versus Average Tax Rates and Progressivity. European Journal of Political Economy, 18(3), 529-544. doi: 10.1016/s0176- 2680(02)00104-0
[8] Johansson, A., C.Heady, J.Arnold, B.Brys, and L.Vartia (2008). "Tax and Economic Growth", Economic Department Working Paper, No.620, OECD.
[9] Peci, B. (2016). "Tax Reforms in Selected Balkan Countries: The Case Study of Kosovo". Applied Economics and Finance Vol. 3, No. 4; November 2016 ISSN 2332-7294 E-ISSN 2332-7308
[10] Mankiw, G., Romer, P., & Weil, D. (1992). A Contribution to the Empirics of Economic Growth. *Quarterly Journal of Economics*, *107*(2), 407-437.
[11] Mendoza, E.G., G.M. Milesi-Ferretti and P.Asea (1995). " Do taxes matter for long run growth"?: Harberger's superneutrality conjecture". International Finance Discussion Papers, No. 511.
[12] Mendoza, E.G., G.M. Milesi-Ferretti and P.Asea (1997). "On the ineffectiveness of tax policy in alerting long run growth: Harberger's superneutrality conjecture" Journal of Public Economics Vol.6. pp 99-126
[13] Solow, R.M. 1956, "A contribution to the Theory of Economic Growth", *Quarterly Journal of Economics*, 70(1):
[14] Xing, J.(2011). "Does tax Structure affects economic growth? Empirical evidence from OECD countries". Oxford University for Business Taxation Working paper, 11/20.
[15] Xing, J.(2012). " Tax Structure and Growth: How Robust is the Empirical Evidence?". Economic Letters,