

Balkan countries challenge—Individual Income taxes effects versus differential value added tax algorithms on regional government revenues

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Abstract

This study addresses to the individual incomes tax (IIT) effects versus the differential value added tax (VAT) algorithms in Balkan countries government revenues. Therefore initially a fixed effects panel regression model is explored regarding Albania, Kosovo, Macedonia, Serbia, Montenegro and Bosnia-Herzegovina as per 1991-2014 period at 95% confidence level aiming to analyze the impact of some macro-variables that vary over time between the countries with a special regard to the IIT and VAT (which are bias predictors) impact on government tax revenues. Correspondently its results confirm a controversy in terms of VAT effects versus the one of IIT on Balkan countries government revenues. Meanwhile pursuing a linear regression analysis through the neighboring countries the VAT effects prevalence on tax revenues / GDP ratio reveals only in Albania case. Comparatively the additional predictors generally impacting the variable in question in the singular “state-analysis” are: GDP per capita, Agriculture/GDP ratio, inflation rates and external debt. Certainly, this helps in the understanding of the necessary economics policies to be implemented aiming the acceleration of Balkan area economic growth and the European Union accession in the near future.

Key words: individual income tax, value added tax, fiscal competition, economic growth, european integration, balkan countries government revenues.

1. INTRODUCTION

As clearly defined also by the name Balkan region (in Turkish means “a chain of wooded mountains”) it is composed from a mix of ethnicities which live and interact between with a common dream: be part of the big European family. During the pertinence of communist systems in the previous years the regional countries have faced different challenges regarding to the socio-economic transition in search of a major efficiency in the democratic era.

Thus, referring to the latest and almost being conscious of the competitive aspects these countries in a certain way have been boosted to invest in legal and institutional framework development with special regards to: markets liberalization and public finance enhancement. Consequently a new political and economical era began, despite the political restrictions especially after the fall of market barriers by giving the opportunity to some countries to accelerate the steps towards European Union membership (es. Greece which joint it in 1981, Slovenia in 2004, Bulgaria and Romania began member of European Union in 2007, and Croatia in 2013). By this way, the rest of the regional countries while contemporary dealing with monetary policy issues gradually implemented a fiscal policy under the sustainability paradigm.

It should be admitted that in no one of the regional countries wasn't developed any strategically transitional shift almost when changes in economic environments boosted the countries to cooperate not only under trade but even under financial aspects by promoting the capital movements. For all the above mentioned reasons a special attention was given to fiscal components which could give a support to the regional countries' fragile public finance such as: personal income tax, small-medium and corporation income tax, custom tariffs, exercise tax and finally the value added tax (VAT). Being that the previous fiscal systems were characterized by:

- a. complex administrative procedures;
- b. differences in tax charges by means of which the discrimination of certain activities and factors and at the same time favoring some others;
- c. non-flexibility and non-simplicity according to Tanzi (2004) and furthermore when some of the characteristics sound true even in the current systems.
- d. an unsustainable tax policy;
- e. non-transparency;
- f. inequalities observed in comparison with West European countries;
- g. no balance between direct and indirect taxes.

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While considering that a new social and economic model should be implemented aiming to promote the progressive taxation and social protection programs designed to reduce income and wealth inequalities. Properly this can be evidenced in Balkan countries aiming to attract foreign investors by contemporaneously acting under a competitive context within the area.

The individual income tax (IIT) is the object of this study almost considering the effects of value added tax as a European Union pre-requisite membership which was the last tax introduced through the above mentioned regional countries fiscal reforms. Under a commercial context the individual income tax refers to:

1. employment relations;
2. economic activity different from the economic activity as owner;
3. financial investments;
4. renting or other leasing of rights or property for consideration;
5. property rights assessment;
6. other sources, including residents and non-resident individuals.

Considering these circumstances the most interesting research refers to the impact of individual income taxes on regional countries government revenues/GDP ratio.

Correspondently, the empirical analysis explored focuses on the following research questions:

1. Does individual income tax (IIT) has a greater impact on tax revenues /GDP ratio than value added tax (VAT) in Balkan area?
2. The individual income tax differential effects on tax revenues/GDP ratio in the neighboring countries.

Therefore the second part of the study deals with the macro-characteristics of the regional countries fighting toward a sound fiscal competition and economic growth as well as aiming the fulfillment of the requirements regarding the European Union accession.

In addition the third part pursues a more empirical examination line regarding the estimation of individual income tax effects on the above mentioned regional countries tax revenues /GDP ratio with the purpose to demonstrate the progress-state done

2. BALKAN'S ECONOMIC COMPETITION CONTEXT

Being inspired by the EU's 2020 Strategy adopted by the Ministry of Economy of six South East European economies (Albania, Bosnia and Herzegovina, Kosovo, Montenegro, Serbia and Macedonia) as described by RCC (Balkan Barometer Business Opinion Report 2015) the main goals are the:

- a) prosperity and job creation and to underscore;
- b) the importance of the EU perspective;
- c) and the region's future.

Mostly referring to the following five pillars:

1. Integrated growth-boosting trade, investments, citizen's mobility and policy enhancement;
2. Smart growth-promoting the knowledge and innovation as well as the creation of value added in a competitive context;
3. Sustainable growth-by enhancing the entrepreneurship toward a greener and more energy-efficient development;
4. Inclusive growth-skills development programs implementation aiming employment creation and labor market including vulnerable groups and minorities;
5. Governance for growth-by improving the capacity of public administrations to strengthen the rule of law and reduce corruption so as to create a business-friendly environment.

In respect of first and third goal the decrease of employment rate and the increase of GDP in the regional countries are synonyms of each other arguing on business performance and governmental role in managing the employment resources while dealing with the trade-off budget expenses and internal-external debts. From the other hand it can be understood the business climate or market efficiency in the area compared with the proactive government role especially in transition and developing economies.

For the above mentioned reasons reveals interesting analyzing the effects of value added tax (VAT) implementation (see Table 1) on regional countries unemployment rate and GDP per capita rate when the inflation rate is significantly reduced during the period taken into consideration (from 1991-2014) while the external debt has maintained a positive trend in the major part of the countries.

Worth highlighting that the inflation rate management into 2-4% level mainly refers to responsive monetary policies implemented by countries in question pursued in line with economic growth positive trend (refer to GDP per capita data) followed by interesting oscillations of unemployment rate (refer to Unemployment rate trend, see Figure 1).

Table 1 - Balkan countries VAT data.
Source: IMF, Author's elaboration

	VAT implementation year	VAT rate during 2014	VAT model type
ALBANIA	1997	Standard rate 20%. The reduced rate is 10%.	Mixed
KOSOVO	2001	Standard rate 16%. The reduced rate is 9%.	Not-European
MACEDONIA	2000	Standard rate 18%. The reduced rate of VAT is 5%	European
SERBIA	2005	Standard rate 20%. Reduced rates 0% and 10%.	Not-European
MONTENEGRO	2001	Standard rate 19%. Reduced rates 0% and 7%.	European
BOSNIA-HERZEGOVINA	2006	Standard rate 17%. The reduced rate is 0%	Not-European

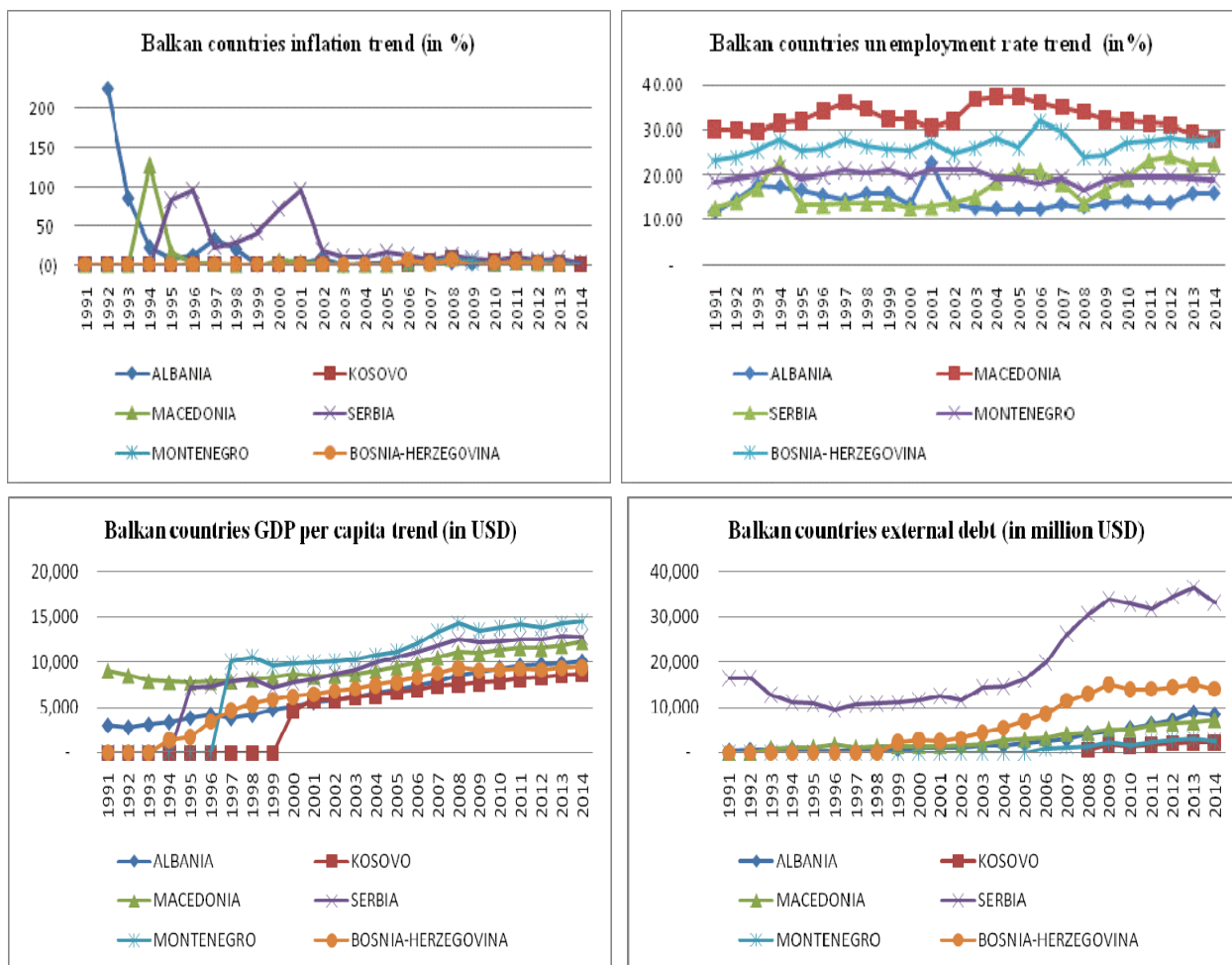


Figure 1 - Balkan countries Inflation, Employment, GDP per capita and External Debt trend.
Source: World Bank, Author's elaboration

Table 2 - Balkan countries Inflation, Employment, GDP per capita and External Debt growth trend.
Source: World Bank, Author's elaboration

Country VAT Implementation year	Inflation rate %		GDP per capita %		Unemployment rate %		External Debt %	
	first 5 years	The rest	first 5 years	The rest	first 5 years	The rest	first 5 years	The rest
ALBANIA -1997	-25%	-1.15%	53%	72%	-111%	3.41%	129%	441%
KOSOVO -2001	5%	-3.93%	18%	25%	N/a	N/a	N/a	N/a
MACEDONIA-2000	-6%	-3.49%	9%	30%	510%	-940%	101%	119%
SERBIA-2005	-10%	-4.06%	16%	3%	-160%	300%	104%	4%
MONTENEGRO-2001	N/a	-3.64%	22%	20%	-280%	90%	N/a	95%
BOSNIA-HERZEGOVINA-2006	-2%	-2.98%	11%	2%	-420%	30%	64%	0%

The latest demonstrates a slight decrease for Macedonia, Serbia and Montenegro and vice versa for Albania and Bosnia-Herzegovina. With special regard to the last year data, the inflation levels noted in the countries refer to -1% to 2%, the unemployment rate instead fluctuated from 16%-28%, the GDP per capita from 8.700\$-14.500\$ and external debt from 2.2 billion\$-33.1 billion\$, where the highest correspondingly belong to Serbia, Bosnia-Herzegovina and Macedonia, Montenegro and against Serbia.

However referring to Table 2 summary in the above mentioned countries from VAT implementation period inflation rate has been reduced while the opposite revealed from unemployment rate in the major part of countries. Meanwhile a positive trend is maintained from GDP per capita when the most fluctuant situation refers to countries external debt.

Other relevant aspects regarding the sources of GDP growth rate which contemporaneously represent also the most important above mentioned countries activities are: export–import, agriculture, foreign direct investments and remittances. By this way, the openness ratio has maintained a positive trend in each of the a/m countries especially after the VAT implementation year where the leader seems to be Macedonia followed from the accelerating steps of Montenegro and Bosnia-Herzegovina (see Figure 2). The agriculture/GDP ratio instead has significantly decreased in all the countries during the 2005 as well as after the VAT implementation period but in following it demonstrates a positive growth trend almost in Albania and consecutively in Kosovo.

Being strongly related to global crisis the other two indicators such as: FDI flows and remittances have suffered a shock during 2007 for two consecutive years (their lowest level was marked during 2009). But in following it can be evidenced a sustainable growth especially in remittances. Under this context the striking performance of Macedonia is plausible while continuously increasing exports and attracting more and more foreign investors with a remarkable FDI growth almost after VAT implementation period.

The latest is referred to the fact that the cost of labor is cheap even the same situation persists also in the other countries and during the last year it has strongly competed with Kosovo and Serbia. From the other hand, the biggest benefits of remittances are attributed to Serbia followed from Bosnia-Herzegovina and Kosovo starting from VAT implementation period. In addition may also added that these indicators trend in a certain way testify the efforts made by the governance especially in changing the regulation by admitting that business people aren't influential on legislative and policy decisions.

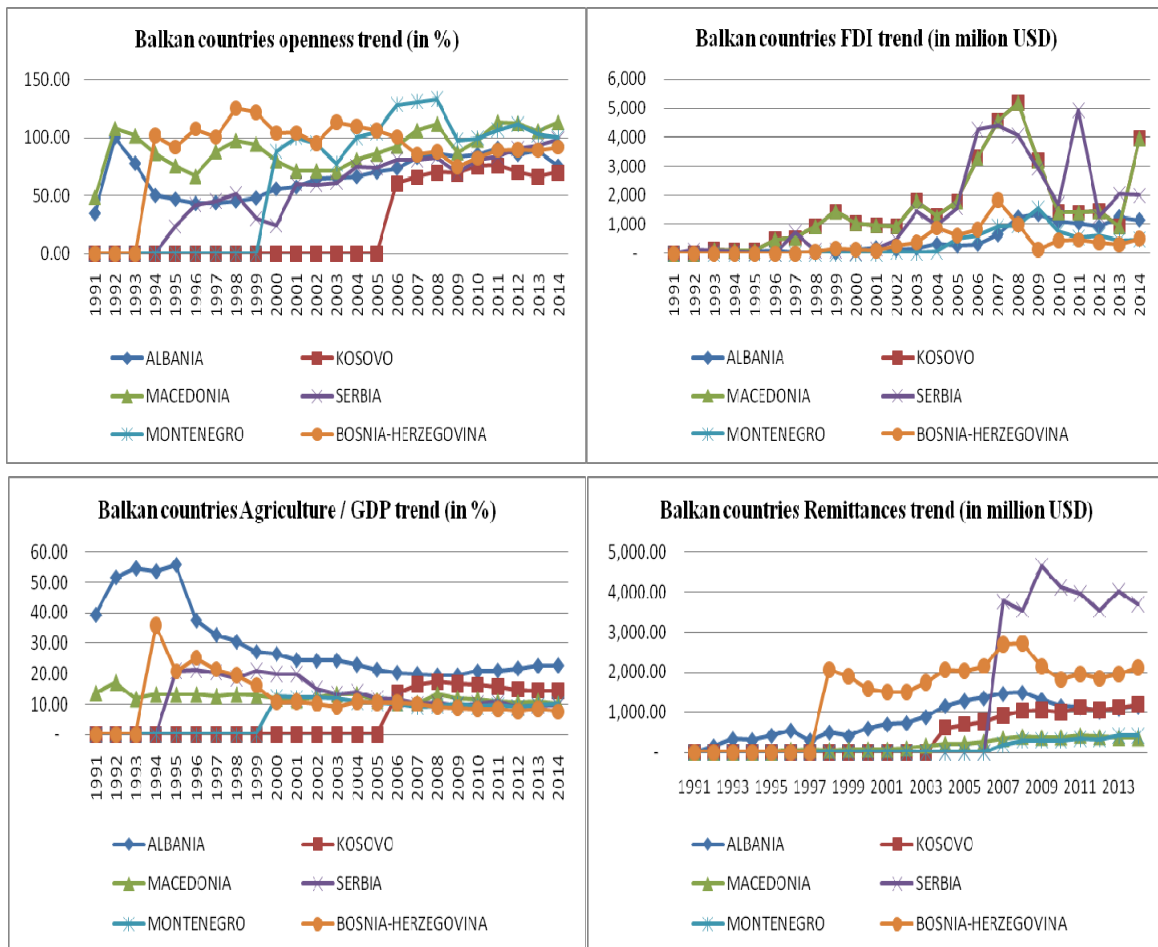


Figure 2 - Balkan countries Openness, FDI, Agriculture /GDP and Remittances trend.
 Source: World Bank, Author's elaboration

Therefore, the question arises: are the general tax revenues and expenses relative to GDP increased after the VAT implementation period in the above mentioned Balkan countries?

Referring to the first indicator the trend evidenced is positive almost after the year 2007 (see Figure 3), which leads to the understanding that in all the countries the VAT implementation has a positive impact in the budget revenues. From the other side the available data pertaining to expenses to GDP ratio in the countries result fluctuant but significant in terms of VAT implementation. Thus, with special regard to the most fluctuant situation which is the Albanian one VAT has given an immediate positive impact during the year 2008 in the expenses to GDP ratio in coherence with the increase of general government tax revenues and external debt ratio.

Furthermore worth mentioned that Bosnia-Herzegovina has increased the expenses disproportionately with general tax revenues during the year 2006 which coincide with VAT implementation period. During the period in question this country has demonstrated the higher rate of tax revenues to GDP in comparison with other ones but in following the general tax revenues after VAT implementation period remained quite constant. This explains external debts decrease of the country by confirming that the expenses increases are supported mainly from internal debts during the last decade.

A more conservative approach instead is implemented from Serbia by maintaining a coherent management of external debts and expenses until 2012 and vice-versa the other two consecutive years. Meanwhile a slight general negative effect is observed in Macedonian budget revenues after VAT implementation while expenses are increased through external debts. Properly aiming the external debt reduction the governance has made the best efforts toward expenses management.

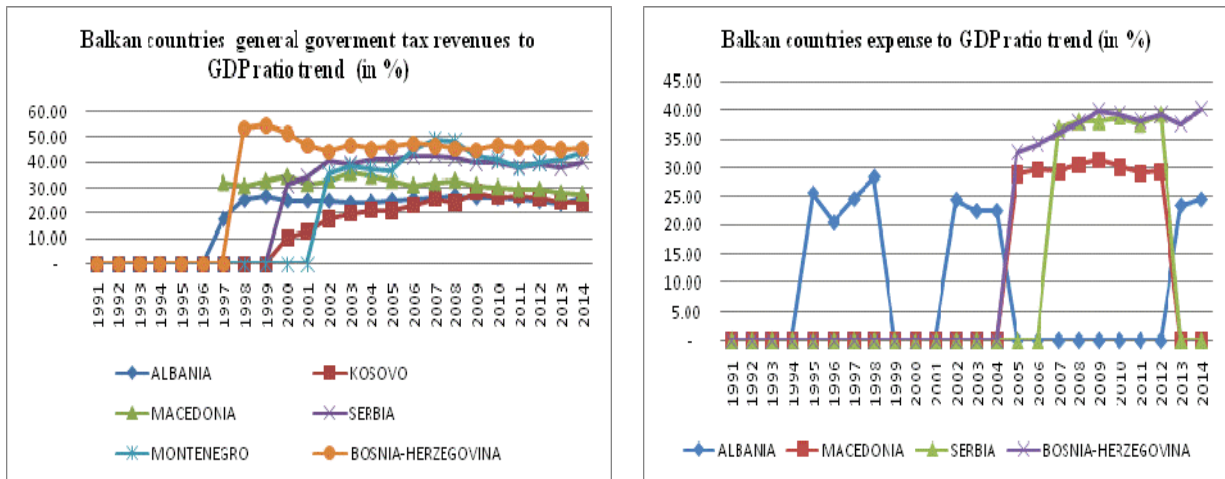


Figure 3 - Balkan general tax revenues and expenses to GDP trend. Source: World Bank, Author's elaboration

Anyway it should be admitted that in general terms in all the countries seems that VAT has positively impacted the GDP growth rate especially in countries with high informality rate such as Albania, Macedonia and Kosovo by averagely increasing the Balkan countries GDP per capita with 25% as well as the unemployment rate in Serbia, Montenegro and Bosnia-Herzegovina with respectively 300%, 90% and 30%.

3. THEORETICAL EVIDENCES ON VAT IMPACT ON GOVERNMENT TAX REVENUES

Different empirical studies have demonstrated interlinks between VAT performance of a country and its level of development. Specifically Ebrill et al. (2001), has affirmed that the revenue gains from VAT are likely to be higher in an economy with higher level of GDP per capita income, lower share of agriculture, and higher level of literacy. By this way VAT seems to be an efficient tool for revenue collection by also having a direct impact on fiscal mobilization, macroeconomic stability and development.

According to Heady (2002) among OECD countries is observed a clear, consistent trend for greater use of the VAT to collect sales tax revenues. Correspondently while these countries continue to rely heavily on income tax collection, the VAT revenues have risen steadily in both absolute and relative terms: the general consumption taxes increased sharply from 12 percent of the total tax revenues in 1965 to 18 percent in 2000. Generally the logic of VAT introduction in many developing countries consists in the replacement of turnover tax or some type of single-stage sales tax.

However, from the other side should be admitted that higher VAT rates provide stronger incentives for evasion and avoidance especially in developing countries where the most representative business is the retail one by laying in serious difficulties even in tax administration process. While another positive argument on VAT existence is that being a single-stage and turnover tax facilitates the collection and enforcement by contemporaneously increasing governmental tax revenues even by considering the administration costs.

Because referring to McMoran (1995) is indicated that the administration and compliance costs under a single-stage tax and a VAT extended to the same level in the production-distribution chain do not differ significantly. In respect of short-time growth effects instead a large body of empirical research such as in Alesina and Perotti (1996), Alesina and Ardagna (1998), Perotti (1999) primarily for industrial countries, has been devoted to understanding under which conditions fiscal multipliers can be small (and even negative). The latest shows that budgetary consolidations tend to be expansionary even when debt is high or grows rapidly. In addition Von Hagen and Strauch (2001) demonstrated that fiscal adjustments that rely primarily on cuts in transfers as well as on wages tend to last longer and can be expansionary, while those that rely primarily on tax increases and cuts in public investment tend to be constricted and unsustainable. Furthermore, Tanzi and Zee (1996) studied the potential effects of fiscal policy on long-term growth. In the same way other researches in the field of endogenous growth suggest that the fiscal policy can either promote or retard both the economic growth and the investments in human and physical capital.

As explained from Chamley (1986). Barro (1990), King and Rebelo (1990), Barro and Sala-i-Martin (1995), Mendoza *et al.*, (1997) the last ones can be affected by taxes while investments can influence the governmental expenditure and other macro and micro variables which consecutively affect economic growth. Meanwhile another issue arises as argued from Keen (2008) related to the proper degree of reliance on trade taxes as VAT is approximately 20%, more of all tax revenue in many developing countries, so that continuing pressures towards further trade liberalization, combined with pressing revenue needs, raise the question of how reduced trade tax revenue can be replaced from domestic sources. and as explained from Baunsgaard and Keen (2005) in many low income countries are experienced difficulties in achieving such replacement in the past as well as its further management.

Under the same context other studies conducted by Christadl, Fetchenhauer and Hoesl (2011) examine the potential confirmation bias in price perception in consequence to a real-world event and different explanations for such a bias by suggesting that participants reported price increases that were significantly higher than the official price level and in line with an undifferentiated belief in market price increases.

A special attention instead goes to agriculture which is defined as a hard-to-tax sector for numerous technical, social and political issues. Firstly, in developing countries, a large part of the sector is informal.

Furthermore, from the social perspective, agriculture merits certain special tax relief as most of the poor are active in the sector and in following, the sector deals with different political constituents and hence needs to be treated more favorably in taxation.

In practice, the majority of countries opt for a VAT exempt in this sector. Another issues has been posed from Tait (1991) concerning the introduction of VAT, being that the latest is also defined as a broad-based consumption tax, all businesses including exempt firms raise their prices and thereby trigger long-lasting inflation, but the experience of countries adopting VAT shows that this concern is unfounded. Contrariwise, it indicates that the VAT is not inflationary, even though in some countries such as Japan and Denmark, the VAT resulted in once-and-for-all inflationary.

Through the same logic line a recent IMF survey shows that the VAT performs relatively well in small countries and islands (with population of less than 5 million) by underlining that indirect taxes are likely to perform better in countries which rely more on foreign trade in compliance with Prest (1979) which argued that the overall tax capacity of a country is positively correlated with its size of trade. On the other hand, Alesina and Wacziarg (1998) as studied from Ebrill (2001) empirically demonstrated that trade and country size are negatively correlated and this leads to the understanding that when a country relies more on foreign trade, the tax administration may shift its focus to a few check points at the border, thereby the collection cost may be reduced by raising tax revenues.

Furthermore as described from *ibid* from the collection efficiency perspective it should be admitted that trade taxes may even be superior to other types of consumption taxes including the VAT. From the other side instead, the VAT, being a general tax (imposed on both imports and domestically produced goods), possess some important advantages: it is less distortionary and has more revenue potential than tariff alone.

4. EMPIRICAL ANALYSIS

Under the above mentioned context the rising question is: *Does VAT positively impact the government tax revenues in the Balkan countries taken into consideration?*

In respect with the above mentioned purpose a fixed effects panel regression model is explored for the six countries taken into consideration regarding the period 1991-2014 at 95% confidence level aiming to analyze the impact of variables that vary over time between the countries almost the VAT (which is a bias) impact on government tax revenues. Obviously, the model implementation was done by previously verifying that the distribution of each country error terms and respective constant are different (as they capture the individual characteristics) and uncorrelated with the others.

Referring to Table 3 results it may be confirmed that the predictors which significantly impact the government tax revenues/GDP ratio under the predefined confidence level of 95% are: VAT, Openness ratio, GDP per capita, Agriculture/GDP ratio, remittances and external debt. Which in general explain the 73.6% of government

tax revenues variance and where 68% of it is attributed to the differences across panels (interclass correlation coefficient rho=0.68).

Table 3 - Fixed effects regression model.
Source: World Banka Data, Author's elaboration

Model 1: Fixed-effects, using 137 observations					
Included 6 cross-sectional units					
Time-series length: minimum 18, maximum 24					
Dependent variable: Government tax revenues / GDP (in %)					
	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
Const	27.5623	33.8077	0.8153	0.4165	
VAT	7.6149	2.82166	2.6987	0.0080	***
OPEN	0.215364	0.0457427	4.7082	<0.0001	***
YPC	0.00135077	0.000431497	3.1304	0.0022	***
AG/GDP	-0.624063	0.153742	-4.0591	<0.0001	***
POP	-9.29295e-06	9.63345e-06	-0.9647	0.3367	
Inflation_rate	0.0305398	0.0403864	0.7562	0.4510	
UNEM_rate	0.471707	0.37803	1.2478	0.2145	
FDI_in_USD	-1.17399e-09	1.14617e-09	-1.0243	0.3078	
REM_in_usd	5.18402e-09	1.87399e-09	2.7663	0.0066	***
EXT_DEBT in usd	-1.15343e-09	3.76373e-010	-3.0646	0.0027	***
EXP_to_GDP	0.0824937	0.0874677	0.9431	0.3475	
Mean dependent var	23.95247	S.D. dependent var		17.66398	
Sum squared resid	9558.482	S.E. of regression		8.924910	
LSDV R-squared	0.774746	Within R-squared		0.736092	
LSDV F(16, 120)	25.79573	P-value(F)		2.18e-31	
Log-likelihood	-485.1910	Akaike criterion		1004.382	
Schwarz criterion	1054.022	Hannan-Quinn		1024.554	
Rho	0.689229	Durbin-Watson		0.616764	

The second point of the empirical analysis consists in the estimation of VAT impact on government tax revenues/GDP ratio in each of the selected Balkan countries (being that they also represent one of the major trade partners of each other).

Hence an ordinary least square model is built for each of the mentioned countries (see Annex I) where against VAT (being different) is used as a bias and the same variables are taken into consideration. And (refer to Table 4) the only country in which VAT has a statistically significant positive impact on government tax revenues/GDP ratio with 29.6% is Albania, followed from GDP per capita as the most common variable with positive impact on governmental tax revenues/GDP ratio.

Table 4 - OLS regression model using VAT as bias in the Balkan countries results.
Source: World Banka Data, Author's elaboration

	VAT	EXP&I MP/G DP	YPC	AGRI/ GDP	POP	INF	UN- EM	FDI	REM	EXT- DEBT	EXP/G DP	Model R square
ALBANIA	+											0.9855
KOSOVO			+			-		+				0.9895
MACEDONIA												0.9051
SERBIA			+	-	-	+				-		0.9348
MONTENEGRO			+		+							0.9372
BOSNIA- HERZEGOVINA								-	+			0.9781

As evidenced neighboring countries results under the predictors taken into consideration vary not only from each other but are also different in comparison with general fixed effects regression model.

5. CONCLUSIVE REMARKS

In this work is addressed an empirical evaluation of the VAT impact on tax revenues/GDP ratio in Balkan countries being that the fiscal policy is a strong instrument used from public authorities for granting facilities with the aim to influence the economic process, adjust the business cycle by contemporary removing the economic imbalances, boosting the competition, supporting the economic growth and moreover pursuing the European dream.

Consecutively by referring to the fixed effects panel regression model explored regarding Albania, Kosovo, Macedonia, Serbia, Montenegro and Bosnia-Herzegovina as per 1991-2014 period at 95% confidence level and also being that the heteroskedasticity and residuals' normality test (see Annex II) confirm the normality of error's distribution and the absence of heteroskedasticity issues in general it can be confirmed that:

- in average if VAT in a certain country varies across time by 1% the governmental tax revenues/GDP ratio increases by 7.61%;
- in average if Openness ratio in a certain country varies across time by 1% the governmental tax revenues/GDP ratio increases by 0.22%;
- in average if Agriculture/GDP ratio in a certain country varies across time by 1% the governmental tax revenues/ GDP ratio decreases by 0.65%;
- the GDP per capita, remittances and external debt impact on governmental tax revenues/GDP ratio is lower even statistically significant at 95% confidence level.

In controversy within the Balkan area results the ordinary least squares analysis handled against at 95% confidence level implemented in each neighboring country demonstrated that only in Albania VAT has a positive impact on tax revenues/GDP ratio where it represents the only predictor with a statistical significant effect on it. Dealing with a quantitative summary Serbia is the only country with more predictor statistically significant on the variable in question. In this isolated case the GDP per capita and inflation independent variables have a statistically positive impact on tax revenues/GDP ratio while with a negative one can be evidenced: Agriculture/GDP ratio, Population and External debt. By analogy in Kosovo the analysis shows that the predictors' impact on tax revenues/GDP ratio is also mixed, the positive ones refer to GDP per capita and FDI while the negative correlation is presented from the inflation ratio. The opposite result instead regarding FDI is evidenced in Bosnia-Herzegovina where only remittances have a positive impact on the tax revenues/GDP ratio. In Montenegro the impact of both predictors on the variable in question is positive such as: GDP per capita and population. Under this context Macedonia is the only neighboring country with no one predictor statistically significant on tax revenues/GDP ratio. Theoretically constrained can be mentioned that the effects of remittances, foreign direct investments and GDP per capita on tax revenues/GDP ratio are always positive, but as can be noted a very limited number of predictors in the analysis in question can confirm their undisputed impact on tax revenues/GDP ratio, here is the case of only GDP per capita. While the fluctuant predictors' result: the population, inflation rate and FDI.

Arguing on different impacts of predictors in the two models previously analyzed in any case it can be confirmed the positive effect of VAT on tax revenues/GDP ratio within the area and its differentiated effect while dealing with each neighboring country. From the other hand being that VAT has a special plan to promote economic competition a deeper analysis regarding the inconsistency aspect results interesting aiming to explore the dynamic effects of VAT in each neighboring country as a future research target.

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ANNEX I

Joint test on named regressors

Test statistic: $F(11, 120) = 30.4276$

with p-value = $P(F(11, 120) > 30.4276) = 1.17473e-029$

Test for differing group intercepts -

Null hypothesis: The groups have a common intercept

Test statistic: $F(5, 120) = 0.717617$

with p-value = $P(F(5, 120) > 0.717617) = 0.611415$

Distribution free Wald test for heteroskedasticity -

Null hypothesis: the units have a common error variance

Asymptotic test statistic: Chi-square(6) = 4078.82

with p-value = 0

Test for normality of residual -

Null hypothesis: error is normally distributed

Test statistic: Chi-square(2) = 12.9717

with p-value = 0.00152485

ANNEX II

ALBANIA

Model 1: OLS, using observations 1992-2014 (T = 23)

Dependent variable: Government tax revenues / GDP

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
Const	-698.343	588.093	-1.1875	0.2601	
VAT	29.6317	6.99903	4.2337	0.0014	***
OPEN	0.0780977	0.108158	0.7221	0.4853	
YPC	0.0101329	0.00801773	1.2638	0.2324	
AG	-0.114268	0.168143	-0.6796	.5108	
POP	0.000206287	0.000174721	1.1807	0.2626	
Inflation	-0.0287624	0.0368093	-0.7814	0.4511	
Unemployment_rate	0.333676	0.259275	1.2870	0.2245	
FDI_in_USD	-2.98763e-010	2.3906e-09	-0.1250	0.9028	
Remittances_in_usd	-1.84214e-09	3.8882e-09	-0.4738	0.6449	
Total_External_Debt	-1.42929e-09	1.15739e-09	-1.2349	0.2426	
Expense_to_GDP	-0.00228261	0.05078	-0.0450	0.9650	
Mean dependent var	19.50035	S.D. dependent var		10.65542	
Sum squared resid	36.08042	S.E. of regression		1.811087	
R-squared	0.985555	Adjusted R-squared		0.971111	
F(11, 11)	68.22963	P-value(F)		1.72e-08	
Log-likelihood	-37.81353	Akaike criterion		99.62706	
Schwarz criterion	113.2530	Hannan-Quinn		103.0539	
Rho	-0.218624	Durbin-Watson		2.389938	

KOSOVO

Model 1: OLS, using observations 1991-2014 (T = 24)

Dependent variable: Government tax revenues / GDP

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	2.5046	10.7442	0.2331	0.8190	
VAT	3.82927	2.18116	1.7556	0.1010	
OPEN	-0.0378057	0.137007	-0.2759	0.7866	
YPC	0.0021185	0.000459965	4.5913	0.0004	***
AG	0.0168669	0.59127	0.0285	0.9776	
POP	-1.26499e-06	5.46113e-06	-0.2316	0.8202	
Inflation	-0.405469	0.192459	-2.1068	0.0537	*
FDI_in_USD	1.62322e-08	7.50599e-09	2.1626	0.0484	**
Remittances_in_usd	1.14057e-09	2.3919e-09	0.4770	0.6407	
Total_External_Debt	2.42354e-010	1.14484e-09	0.2117	0.8354	
Mean dependent var	13.87292	S.D. dependent var		11.70777	
Sum squared resid	32.93602	S.E. of regression		1.533810	
R-squared	0.989553	Adjusted R-squared		0.982837	
F(9, 14)	147.3429	P-value(F)		2.67e-12	
Log-likelihood	-37.85268	Akaike criterion		95.70537	
Schwarz criterion	107.4859	Hannan-Quinn		98.83075	
Rho	0.000091	Durbin-Watson		1.983718	

MACEDONIA

Model 1: OLS, using observations 1997-2014 (T = 18)

Dependent variable: Government tax revenues / GDP

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>
Const	75.6462	124.612	0.6071	0.5661
VAT	6.36954	4.63324	1.3747	0.2183
OPEN	0.0795038	0.0888549	0.8948	0.4054
YPC	-0.000100738	0.00223077	-0.0452	0.9654
AG	0.785273	0.535365	1.4668	0.1928
POP	-3.12354e-05	6.3 867e-05	-0.4936	0.6392
Inflation	-0.268715	0.291366	-0.9223	0.3920
Unemployment_rate	0.0776892	0.26755	0.2904	0.7813
FDI_in_USD	-6.56257e-012	3.35286e-010	-0.0196	0.9850
Remittances_in_usd	9.31447e-09	1.91552e-08	0.4863	0.6440
Total_External_Deb	-1.48572e-09	1.36169e-09	-1.0911	0.3171
Expense_to_GDP	-0.022654	0.0492494	-0.4600	0.6617
Mean dependent var	31.56733	S.D. dependent var		2.216073
Sum squared resid	7.919647	S.E. of regression		1.148887
R-squared	0.905139	Adjusted R-squared		0.731226
F(11, 6)	5.204569	P-value(F)		0.027452
Log-likelihood	-18.15167	Akaike criterion		60.30334
Schwarz criterion	70.98780	Hannan-Quinn		61.77658
Rho	-0.257405	Durbin-Watson		2.499570

SERBIA

Model 1: OLS, using observations 1991-2014 (T = 24)

Dependent variable: Government tax revenues / GDP

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	941.776	373.446	2.5219	0.0268	**
VAT	-15.6862	10.2292	-1.5335	0.1511	
OPEN	-0.393361	0.238111	-1.6520	0.1244	
YPC	0.0129556	0.00299721	4.3225	0.001	***
AG	-5.92385	1.05343	-5.6234	0.0001	***
POP	-0.000114796	4.67954e-05	-2.4531	0.0304	**
Inflation	0.333794	0.100147	3.3330	0.0060	***
Unemployment_rate	-1.00126	0.617747	-1.6208	0.1310	
FDI_in_USD	-6.22807e-011	1.85675e-09	-0.0335	0.9738	
Remitta ces_in_usd	-1.81688e-09	3.69136e-09	-0.4922	0.6315	
Total_External_Debt	-3.16498e-09	1.20867e-09	-2.6186	0.0224	**
Expense_to_GDP	0.178375	0.186605	0.9559	0.3580	
Mean dependent var	24.52662	S.D. dependent var		19.54953	
Sum squared resid	572.5288	S.E. of regression		6.907296	
R-squared	0.934868	Adjusted R-squared		0.875163	
F(11, 12)	15.65820	P-value(F)		0.000019	
Log-likelihood	-72.11864	Akaike criterion		168.2373	
Schwarz criterion	182.3739	Hannan-Quinn		171.9877	
Rho	-0.098133	Durbin-Wa son		2.130313	

MONTENEGRO

Model 1: OLS, using observations 1991-2014 (T = 24)

Dependent variable: Government tax revenues / GDP

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
Const	-2333.19	628.747	-3.7109	0.0021	***
VAT	5.89221	9.74684	0.6045	0.5545	
OPEN	-0.0585327	0.161915	-0.3615	0.7228	
YPC	0.00131374	0.000553597	2.3731	0.0314	**
AG	0.701212	1.26104	0.5561	0.5864	
POP	0.00382973	0.0010322	3.7103	0.0021	***
Inflation	1.96844	1.22304	1.6095	0.1284	
Remittances_in_usd	-3.42292e-08	3.58331e-08	-0. 552	0.3546	
Total_External_Debt	-6.99256e-09	5.48696e-09	-1.2744	0.2219	
Mean dependent var	22.41212	S.D. dependent var		21.29108	
Sum squared resid	654.4750	S.E. of regression		6.605427	
R-squared	0.937227	Adjusted R-squared		0.903749	
F(8, 15)	27.99474	P-value(F)		1.15e-07	
Log-likelihood	-73.72388	Akaike criterion		165.4478	
Schwarz criterion	176.0502	Hannan-Quinn		168.2606	
Rho	-0.088497	Durbin-Watson		2.144789	

BOSNIA-HERZEGOVINA

Model 1: OLS, using observations 1991-2014 (T = 24)

Dependent variable: Government tax revenues / GDP

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
Const	-59.6963	79.2397	-0.7534	0.4658	
VAT	-1.98104	9.18045	-0.2158	0.8328	
OPEN	0.126151	0.164662	0.7661	0.4584	
YPC	0.000433862	0.00215659	0.2012	0.8439	
G	-0.513343	0.407301	-1.2604	0.2315	
POP	7.40367e-06	1.86573e-05	0.3968	0.6985	
Inflation	-0.233982	0.691131	-0.3385	0.7408	
Unemployment_rate	1.17097	0.750777	1.5597	0.1448	
FDI_in_USD	-1.49246e-08	4.03249e-09	-3.7011	0.0030	***
Remittances_in_usd	2.45728e-08	3.45134e-09	7.1198	<0.0001	***
Total_External_Debt	2.15806e-012	1.05201e-09	0.0021	0.9984	
Expense_to_GDP	-0.153356	0.183154	-0.8373	0.4188	
Mean dependent var	33.55371	S.D. dependent var		22.13459	
Sum squared resid	245.7313	S.E. of regression		4.525220	
R-squared	0.978193	Adjusted R-squared		0.958204	
F(11, 12)	48.93546	P-value(F)		3.12e-08	
Log-likelihood	-61.96874	Akaike criterion		147.9375	
Schwarz criterion	162.0741	Hannan-Quinn		151.6879	
Rho	0.106312	Durbin-Watson		1.7518 6	