

ECONOMETRIC ANALYSIS OF INDIRECT TAXES ON ECONOMIC GROWTH: CASE OF REPUBLIC OF MACEDONIA

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Abstract: Recently, there has been going a strong debate regarding the effects of indirect taxes on the economic growth, showing contradictory results of such nexus regarding country and time period. In addition, having into consideration also the fact that taxes are an important factor for the countries' growth, main aim of this paper is to research the effects of indirect taxes on economic growth in the case of Republic of Macedonia, utilizing quarterly time series covering time period 2000 – 2016.

In addition, Augmented Dickey Fuller test for unit root has been applied in order to find whether the data have unit root, thus whether they are stationary or not as well as Johansen test for co-integration has been used to find if data possess at least one co-integrating vector in the model, thus indicating the existence of significant long-term relationship among indirect taxes and economic growth in Macedonia. Further, Vector Error Correction model has been used to find the effect of indirect taxes on real GDP growth, suggesting positive effects of indirect taxes on real GDP in the case of Republic of Macedonia for time period 2000 – 2016.

Finally, such results reveal also some further recommendation for the tax policymakers of Macedonia due to the positive effects of indirect taxes on growth, mainly due to the dominance of the taxes from consumption compared to other (direct taxes) in Macedonia.

Keywords: indirect taxes, ADF, co-integration, VECM.

INTRODUCTION

Nowadays, taxation is considered as a main source of public revenue and governments use tax proceeds in order to complete their functions, such as: provision of goods, maintenance of law and order, regulation of trade and business to ensure social and economic maintenance (Edame and Okoi, 2014).

To our best knowledge, in developing countries, there exist plenty of indigenous empirical literature addressing the relationship between indirect tax and economic growth mainly motivated by two elements: inconsistency in existing empirics in developed economies which often generalized to developing economies and knowledge gap occasioned by its empirical evidence. Moreover, main function of a tax system is to raise enough revenue to finance essential expenditures on the goods and services provided by government; and tax remains one of the best instruments to boost the potential for public sector performance and repayment of public debt (Okoye and Ezejiofor, 2014). Thus, it is clear that taxation plays an important role in assisting needs of one country as well as to promote self-reliance.

It is understandable that there is a paradigm shift to taxation revenue as an alternative source of revenue and in this case Republic of Macedonia is not an exception. In addition, the will of the government to increase revenues from collection of taxes from its payers should not be overemphasized. Mainly, this is due to its well-known importance of tax lies in its ability to generate revenue for the government, influence the consumption trends and grow and regulate economy through its influence on vital aggregate economic variables (Fasoranti, 2013).

In this spectrum, this paper aims to investigate the impact of indirect taxes on economic growth in Republic of Macedonia, through the usage of quarterly data for the time period 2000q1-2016q4. In order to set a direction for this paper, its structure contains several sections: section two reviews the current literature review, followed by section three, explaining the methodology and data specification, section four covers the discussion of the results, while section five concludes with recommendations of the paper.

LITERATURE REVIEW

Relationship between indirect tax and economic growth in Republic of Macedonia is seen from endogenous framework and its growth rate of a country. Further, taxes do not just constitute the principal source of government revenue but they are in fact fundamental components of any attempts to build societies, and indeed nations. (Ibadin and Eiya, 2013). In addition to this, authors King and Robelo (1990), explained the endogenous growth model by believing that government policy, including taxation, can permanently increase the output per capital within high level of innovation. However, the main implication is that taxes and public expenditures have consistent effect on output in short term and long term. The effect of taxation as generating tool for economic growth in developing countries has been studied by many scholars ((Bleaney and Gemmell (1999); Myles

(2000); Cremer et al. (2001); Musanga (2007); Greenidge and Drakes (2009); Arisoy and Unlukaplan(2010); Izedonmi and Okunbor (2014)).

Moreover, authors Martinez-Vacquez et al (2009), considering direct and indirect forms of taxation explained theoretical optimal tax literature, however the main question that still remained largely unanswered is the economic consequences of different mixes of direct and indirect taxes.

According to Cremer et al. (2001), they explained that because individuals differ in their qualitative characteristics, general income tax will not suffice, thus indirect taxes should form basis for optimal tax policy.

The debate between direct and indirect tax for designing optimal tax system has been polarized, where at one side are proponents of indirect tax as a growth driver while at the other side there are scholars who observed negative or non-significant relationship between indirect tax and economic growth.

In their paper, Greenidge and Drakes (2009), use unrestricted error correction model to examine the relationship between tax policy and macroeconomic activities, claiming that total tax and indirect taxes have a contractionary effect on the economy in both the short run and long run period. In addition, in his paper Musanga (2007) investigated the relationship among indirect taxes and economic growth for the case of Uganda for time period 1987 to 2005, by utilizing co-integration regression technique, resulting that a % change in indirect tax would decrease economic growth by 0.53%.

Authors Kneller et al. (1999) focused their analysis mainly on 22 OECD countries covering the time spin 1970 - 1995, using five years average of the annual data to circumvent the business cycle effect and static panel econometric technique to investigate the relationship between fiscal policy and growth, where results suggested significant positive link between indirect taxes and economic growth.

Further, for the case of Turkey, authors Arisoy and Unlukaplan(2010), investigated the relationship between direct and indirect tax and economic growth, for time series covering the period 1968-2006, through ordinary least square econometric technique, revealing that real output is positively related to indirect tax revenue. They concluded that indirect taxes are significantly and positively correlated with economic growth in Turkey. Moreover, Scarlet (2011) examined the relationship between taxation and economic growth for the case of Jamaica, by employing quarterly time series data for time period 1990 to 2010, indicating as a results an existence of a significant positive relationship between indirect tax and economic growth in the long run.

METHODOLOGY AND DATA SPECIFICATION

In order to analyze the relationship between indirect taxes and economic growth in the case of Republic of Macedonia, quarterly time series have been employed for the time period 2000q1 to 2016q4. The major objective of this paper is to examine the relationship between indirect taxes and economic growth rate in Republic of Macedonia, and for this purpose the null hypothesis has been se as follows:

H1: indirect taxes have positive impact on economic growth in Republic of Macedonia.

Moreover, data are taken from official reports of Ministry of Finance and Central Bank, where the composition of indirect taxes is made of VAT and excises.

In addition, Solow model of neoclassical growth has been employed, indicating Indirect taxes, direct taxes and Gross Fixed Capital Formation concerted to natural logarithmic as independent variable and real GDP as dependent variable, while labor force participation rate has been removed from the model due to insignificance.

Further, the unit root test has been employed in order to check if time series are stationary or do not contain unit root, and in this direction Augmented Dickey Fuller test has been used. Moreover, based on results of unit root, Johansen test for co-integration has been employed in order to find co-integrating vector rank in this model, thus in order to determine whether there exist a significant long-run relationship between the variables in the following basic regression model:

$$\ln RGDP = \beta_0 + \beta_1 \ln DT + \beta_2 \ln IT + \beta_3 \ln GFCF + \varepsilon \quad (1)$$

In the following section are presented the results of unit root test, co-integration and VECM of the relationship among indirect taxes and economic growth in Republic of Macedonia.

EMPIRICAL RESULTS

In order to determine the effects of indirect taxes on economic growth in Republic of Macedonia for the time period 2000q1-2016q4, firstly time series are checked for unit root. But in addition, lag structure has been used determined by employing four selection criteria such as FPE, AIC, SBIC and HQIC criteria. Moreover, table indicate the results of lag structure selection for the model.

Table1. Lag structure selection

Lag	LR	FPE	AIC	HQIC	SBIC
0		7.4e-09	7.36926 -	7.31465 -	7.22964
1	331.92	5.0e-11	-12.368	-12.0949	-11.6699
2	68.514	2.7e-11	-12.9766	-12.485	-11.72
3	45.738	2.2e-11	-13.2055	-12.4955	-11.3904
4	116.97*	5.6e-12*	-14.6216*	-13.6932*	-12.2481*

Source: author's calculations.

In order to determine if the variables possess unit root, Table 2 reflects the results of the conducted Augmented Dickey Fuller test for unit root, with results indicating the accepted null hypothesis that the series contain unit root at zero order levels for each variable, thus it is excepted the null hypothesis that the series are non-stationary in their level. Regarding the null hypothesis of a unit root, it is strongly rejected for the differenced series of all variables, thus indicating that all variables are stationary in their first difference.

Table2. Unit root – Augmented Dickey Fuller test

	Variable	Augmented Dickey Fuller	Comment
Level	lnRGDP	0.170 (-2.923)	H₀
	lnDT	-1.178 (-2.923)	H₀
	lnIT	-1.971 (-2.923)	H₀
	lnGFCF	-1.471 (-2.923)	H₀
First difference	lnRGDP	-3.304 (-2.924)	H₁
	lnDT	-4.753 (-2.924)	H₁
	lnIT	-5.026 (-2.924)	H₁
	lnGFCF	-3.097 (-2.924)	H₁
Notes:			
† numbers in brackets represent lag length in ADF test			

Source: author's calculations.

The following table illustrates trace test (λ trace) statistics results regarding the existence of long run equilibrium between the indirect taxes and real GDP. In addition, null hypothesis of no co-integration ($r=0$) based on the trace test between these variables is rejected at 5% level of significance and accept at $r \leq 1$ at 5% level of significance, thus suggesting presence of one co-integrating vector between the variables, indicating as well and the existence of a significant long-run relationship among these variables.

Table3. Johansen test for co-integration

Null hypothesis	Alternative hypothesis	λ - trace	95 % critical value
$r = 0$	$r > 0$	48.0450	47.21
$r \leq 1$	$r > 1$	18.6348*	29.68
$r \leq 2$	$r > 2$	6.4349	15.41

Source: author's calculations.

Based on the results conducted from the Vector Error Correction Model which are illustrated in table4, it is indicated that indirect taxes have positive effect on real GDP in the long run at 5% level of significance, while direct taxes have negative effect on real GDP growth rate in the long-run in Republic of Macedonia for the time period 2000-2016. Moreover, indicative results of Table 4 suggest to **accept the hypothesis that indirect taxes have positive impact on real GDP in the long run in Republic of Macedonia.**

Table4. Vector error correction model

Variables (co-integration vector 1)	β	α
Real GDP	1	0
lnDT	0.465 (-0.008)	-2.927 (0.000)
lnIT	-0.166 (0.059)	1.689 (0.000)
ln GFCF	1.008 (0.001)	-1.452 (0.000)

Source: author's calculations.

Further, the long run regression test results are indicated as follows:

$$\mathbf{RGDP} = -0.465\mathbf{DT} + 0.166\mathbf{IT} - 1.000\mathbf{GFCF} \quad (2)$$

Based on such results, we can claim that in Republic of Macedonia there exist a positive relationship among indirect taxes and real GDP and negative nexus among direct taxes and real GDP, mainly because of the high dominance of consumption tax, compared Personal Income tax and Corporate Tax, which from nature are more distortive than VAT and Excise.

CONCLUSION AND RECCOMANDATIONS

The major objective of this paper was to examine the impact of indirect taxes on the economic growth of Macedonia. Moreover, it was adopted the Vector Error Correction Model in analyzing the data, having observed that the residuals were all non-stationary in their level and stationary in their first difference. In addition, the existence of one co-integrating vector while adoption of Johansen test for co-integration, implied the need of VECM in order to determine the long-run relationship among indirect taxes and real GDP in Macedonia for time period 2000q1-2016q3. Results of VECM identified a positive long-run relationship among indirect taxes and economic growth, while a negative one among direct taxes and economic growth in Macedonia.

Such results can be seen as further contribution to the existing literature and debate regarding the relationship among indirect taxes and economic growth in developing countries as well as suggestions for Macedonian policymakers regarding future tax policies. The positive effects of indirect tax on economic growth of Macedonia is mainly due to the dominance of consumption taxes compared to distortive taxes such as Personal Income Tax and Corporate Tax. Thus, having into consideration such results, government in a transparent and judicious way, should consider these taxes through a detailed defined program regarding infrastructural developments to make for willing compliance to tax payments.

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