IMPACT OF DIRECT TAXES ON ECONOMIC GROWTH IN REPUBLIC OF NORTH MACEDONIA

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ABSTRACT:

The main objective of this paper is to investigate and determine the nature of the relationship between direct taxes and economic growth in Republic of Macedonia, utilizing quarterly time series covering time spin 2000 – 2015. Furthermore, findings reveal that data are non-stationary in their level and stationary in their first difference based on two test for unit root Augmented Dickey Fuller and Phillips Perron test, respectively. Moreover, Johansen test for co-integration indicate the rank number as one, while evidence from Vector Error Correction model suggest negative and significant effect of Personal Income tax on Real GDP, while Corporate Income Tax is showing positive and insignificant effect on real GDP in Macedonia. Finally, such results can contribute as further recommendation for the Macedonian tax policymakers in the future, since tax rate cuts even though encourage employment, savings and investment, if are not financed by immediate expenditure cuts, will increase budget deficit, therefor reducing national saving and raise interest rates in the long-run, thus reducing positive direct impact on economic growth.

KEYWORDS: Personal Income Tax, Corporate Tax, Granger Causality, VECM

INTRODUCTION

Evidence for occasionally conflicting results from different hypothesis regarding the relationship between direct taxes and economic growth are present at several empirical studies accomplished so far, that confirm the fact that between direct taxes and economic growth process there exist a connection, regarding its length and strength. Existing debate for the impact of direct taxes and economic growth is one of the main reasons for attraction of many scholars' interest in analyzing the nexus between these two variables. Although the existing findings are controversy, the seems to achieve an agreement to the existence of this relationship but disagreement for the direction of the impact of direct taxes on economic growth in the long run and short run and in the level of development of the countries.

Regarding the controversial empirical evidence of the impact of direct taxes on economic growth in developing countries, this paper tries to address the significant relationship between direct taxes (Personal Income tax and Corporate tax) and economic growth of Republic of Macedonia for the last 15 years. The dissertation also addresses these results as further recommendation for eventually government changes in the near future. In analysis we check the effects in the long-run and short-run of Direct tax divided into Personal Income Tax and Corporate Income Tax, Gross Fixed Capital Formation and Labor Force participation rate in Real GDP, through conduction of VECM, after employment of Augmented Dickey Fuller and Phillips-Perron test for Unit Root and Johansen test for co-integration.

The paper is structured as follows: the first section is dedicated to the literature review regarding the nexus between direct taxes and economic growth, second section covers the research methodology, third section is dedicated to the results of the analysis and last chapter convey conclusions and recommendations of this paper.

1. LITERATURE REVIEW

Regarding another approach of the effects of taxation, different studies claim substantially different conclusions on the relative impact of direct and indirect taxes on economic growth with

multiplicity of problems ranging from inconclusive findings, chaotic generalization of results and findings in developed countries to developing countries (Avi-Yonah and Margalioth (2006); Burgess and Sten (1993)).

There exist several researchers (Lee and Gordon (2005), Jones et al. (1993), Li and Sarte (2004), Kneller et al (1999), Wildmam (2001)), that have reported positive relationship between indirect tax and economic growth, while others as (Emran and Stigliz (2005), Gordon and Li (2005), Baunsgaard and Keen (2005), Abizadelh (1979), Chelliah (1989)), reported relative importance of direct taxation as the driver of economic growth. Moreover, Myles (2000) findings claimed that direct tax policy is a stimulant for boosting economic growth while authors Barry and Jules (2008) found that direct taxes have negative impact on economic growth in the Unites States.

In their study, authors Tosun and Abizadeh (2005) claimed that the share of personal income tax responded positively to economic growth while McCarten (2005) suggested that the ratio of direct tax to GDP and the ratio of direct tax to total tax have stimulated positive effects on real growth in Pakistan. Moreover, Lee and Gordon (2005) by using cross-country data indicated that corporate tax rates have negative and significant correlation with cross-sectional differences in average economic growth rates. Moreover, Arnold et at (2011) study findings claim that personal income taxes are progressive with marginal tax rates that are higher than their average rate, by discouraging savings and labor supply on the other side.

Further, Bird (2003) suggested as best effective tax for developing countries to be the one that produces the largest volume of revenues by being less costly and with disproportionate manner. Moreover, in his study he identified broad based VAT as an ideal tax that suits the situation. Disaggregated empirical review suggest that studies on effects of direct taxation are divided along two conflicting perspectives with majority inclining towards the negative effects of direct taxation on economic growth.

In his study, Widmalm (2001) suggest that personal income tax is negatively correlated with growth, and corporate income tax does not correlate with growth at all. Moreover, study assumptions are that tax structures have not been changed during the entire analyzed period and structure of tax revenue in all countries cover in the empirical analysis is the same.

2. RESEARCH METHODOLOGY

This analysis of dissertation emphasizes the testing of the impact of direct taxes on economic growth in Republic of Macedonia, for the time period 2000 – 2015, by employing quarterly time series of real GDP growth rate, Direct tax divided into Personal Income Tax and Corporate Income Tax, Labor Force participation rate and Gross Fixed Capital Formation as % of GDP. Moreover, the quarterly data are obtained from the published reports of Ministry of Finance. Then it is continued with the Johansen test for co-integration, and since the results indicate that variables have unit root, thus are non-stationary at their level, but stationary in their first difference, and due to the one order integration, the Vector Error Correction Model has been used for checking the effects of the variables. Moreover, the following equation implicit the model of the regression:

$$logGDPR = \beta_0 + \beta_1 logPIT + \beta_2 logCT + \beta_3 logGFCF + \beta_4 logLF + \varepsilon \qquad (2.1)$$

3. EMPIRICAL ANALYSIS OF THE RELATIONSHIP BETWEEN DIRECT TAXES AND ECONOMIC GROWTH

This section of the paper is dedicated to the interpretation of the results of the conducted analysis, where for each method and technique mention in the previous section and used in this empirical investigation, results are presented in particular.

3.1. Unit Root Test

In order to start testing the effects of the independent variables at dependent variable in this model, the first step that is applied for checking the unit root of the variables, by using Augmented Dickey Fuller and Phillips Perron test.
Moreover, the following table firstly focus the results of the optimal lag length based on the following AIC, SBIC, HQIC and FEC criterion.

Table 1. Determination of lag structure

Lag	LR	FPE	AIC	HQIC	SBIC
0		3.3e+13	36.8168	36.8308	36.8512
1	268.3	8.4e+12	35.4322	35.4741	35.5355
2	51.466	6.8e+12	35.201	35.2708	35.3732
3	48.329	5.4e+12	34.9865	35.0842	35.2275*
4	16.847*	5.1e+12*	34.9395*	35.065*	35.2493

Source: author's calculations.

As can be seen in the table 1, the optimal lag length according to the AIC and HQIC is four lags, which imply the selection of this lag length. Moreover, the SBIC imply the lag length to be three, but since literature evidence imply AIC as better criteria for using in the model of monthly time series, therefore, lag length on this model is set to be as four.

The next step employs the results of the Augmented Dickey Fuller and Phillips-Perron test for Unit Root, which are presented in the table 2. Beside these tests, also are taken into consideration the trend graphs of Real GDP growth rate, Personal Income tax, Corporate Income Tax, Gross fixed Capital Formation as % of GDP and Labor Force participation rate.

Table 2. Results of Augmented Dickey Fuller and Phillips-Perron test

	Variable	Augmented Dickey Fuller	Phillips-Perron	Comment
Levels	**logGDPR**	-1.299 (-2.928) MacKinnon approximate p-value for Z(t) = 0.6297	-1.268 (-2.920) MacKinnon approximate p-value for Z(t) = 0.6436	**H_0**
	logPIT	-0.313 (-2.928) MacKinnon approximate p-value for Z(t) = 0.9779	-4.606 (-2.920) MacKinnon approximate p-value for Z(t) = 0.0001	**H_0**
	logCT	-1.716 (-2.928) MacKinnon approximate p-value for Z(t) = 0.4229	-5.262 (-2.920) MacKinnon approximate p-value for Z(t) = 0.0000	**H_0**
	logGFCF	-1.333 (-2.928) MacKinnon approximate p-value for Z(t) = 0.6138	-2.127 (-2.920) MacKinnon approximate p-value for Z(t) = 0.2338	**H_0**
	logLF	-1.162 (-2.928) MacKinnon approximate p-value for Z(t) = 0.6898	-2.481 (-2.920) MacKinnon approximate p-value for Z(t) = 0.0093	**H_0**
First difference	**ΔlogGDPR**	-2.049 (-2.928) MacKinnon approximate p-value for Z(t) = 0.2657	-22.549 (-2.920) MacKinnon approximate p-value for Z(t) = 0.0000	**H_1**

	ΔlogPIT	-2.828 (-2.928) MacKinnon approximate p-value for Z(t) = 0.0544	-17.049 (-2.920) MacKinnon approximate p-value for Z(t) = 0.0000	**H_1**
	ΔlogCT	-2.141 (-2.928) MacKinnon approximate p-value for Z(t) = 0.2285	-20.511 (-2.920) MacKinnon approximate p-value for Z(t) = 0.0000	**H_1**
	ΔlogGFCF	-2.579 (-2.928) MacKinnon approximate p-value for Z(t) = 0.0973	-3.784 (-2.920) MacKinnon approximate p-value for Z(t) = 0.0031	**H_1**
	ΔlogLF	-2.091 (-2.928) MacKinnon approximate p-value for Z(t) = 0.2480	-3.452 (-2.884) MacKinnon approximate p-value for Z(t) = 0.0093	**H_1**
Notes: † numbers in brackets represent lag length in ADF and PP test ‡ Numbers in parentheses represent critical values at the 5% level of significance.				

Source: author's calculations

Evidence from the overall results from the conducted Augmented Dickey Fuller and Phillips Perron test for all the included variables in the model, as well as taking consideration their trends, it is suggested that all the variables are non-stationary at their level and stationarity at their first difference, thus they have unit root when checked in their level, and they do not have unit root in their first difference. These results also should imply that they have one co-integrated order, but for having an accurate result, in this case was employed the Johansen test for co-integration.

3.2. CO-INTEGRATION TEST

Theory indicates that two or more variables are co-integrated if they share a common trend. Thus, when the series are linked by a long-run equilibrium relationship, which relationship can deviate in the short-run but still have or must return to it in the long term and therefore with other words we can say that they exhibit same stochastic trend (Stock and Watson, 1988). Expressed it differently, Co-integration is considered as one exception to the general rule that states, if two series are both I (1), in that case any linear combination of them will yield a series integrated in a lower order, that de facto means that common stochastic trend is cancelled out, which will lead to something that is not spurious but has some significance in economic terms. Moreover, Johansen technique let us investigate the existence of non-unique co-integrating relationships at cases with more than two variables. Indeed, this technique represents a test of the rank of the matrix Π.

Moreover, when we deal with two non-stationary series, in this case co-integration requires that the matrix Π not to have full rank thus $0 < r(\Pi) = r < n$, where r represents the number of co-integrated vectors.

Based on the Likelihood ratio test (LR) we use two suggested tests statistics in order to determine the number of co-integrated vectors: trace test and maximum eigenvalues test.

Moreover, trace test can be estimated through the following equation:

$$Trace = -T \sum_{i=r+1}^{\Pi} \log(\lambda) \quad (3.1)$$

According to trace test, null hypothesis claim that the number of co-integrating vectors is ≤ r while alternative hypothesis state that the number of c0-integrating vectors = r.

On the other side, the maximum eigenvalues test (λmax) can be expressed as:

$$\lambda\, max = -T \log(1 - \lambda) \quad (3.2)$$

In this case, null hypothesis claims that the number of co-integrating vectors = r while the alternative hypothesis is that the co-integrating vectors are r+1.

Since the first difference series are stationary, it is examined the existence of co-integration between variables. The ADF and PP unit root test suggests that the estimated residuals from equation 4 and 5 are stationary: in both the cases, the null hypothesis of a unit-root can be rejected, meaning that there is evidence of a co-integration relationship between the series of the variables. Having established the long run relationship by the Engle-Granger two-steps co-integration test, Johansen-Juselius procedure is used to further test for co-integration between government expenditure and revenues.

Table 3 presents the result of the trace test ($\lambda -$ trace) and maximum eigenvalues test (λ-max) statistics for the existence of long run equilibrium. The null hypothesis of no co-integration (r=0) based on both the trace test and the maximum eignvalues test between logGDPR, logPIT, logCT, logGFCF and logLF is rejected at (5%) level of significance.

Table 3. Results of Johansen co-integration test

Johansen-Juselius co-integration test results.		
Null hypothesis	**λ_{trace}**	**λ_{max}**
r = 0	44.4434 [15.41]	44.0913 [14.07]
r ≤ 1	0.3520 [3.76]	0.3520 [3.76]
*terms in [ ] indicates 5% level critical value.		

Source: Authors calculations

3.3. VECTOR ERROR CORRECTION MODEL (VECM)

In the estimation of this model, this study adopts Vector Error Correction Model framework. A VECM is a restricted VAR designed for use with non-stationary series that are known to be co-integrated. Following Barro (1990) and Worlu and Emeka (2012), the paper expressed VECM as thus:

$$\Delta logGDPR = \beta_0 + \sum_{k=1} \alpha_k \phi_{k,t-1} + \sum_{k=1} \alpha_{1i} \Delta logGDPR_{t-1} + \sum_{k=1}^{r} \alpha_{2i} \Delta logPIT_{t-1} + \sum_{k=1}^{r} \alpha_{3i} \Delta logCT_{t-1} + \sum_{k=1}^{r} \alpha_{4i} \Delta logGFCF_{t-1} + \sum_{k=1}^{r} \alpha_{5i} \Delta logLF_{t-1} + \varepsilon_t \quad (3.3)$$

Taking into consideration the variables included into the above equation, table 4 represent the results of VECM regarding the long run effects of independent variables logPIT, logCT, logGFCF and logLF at dependent variable logGDPR, thus a summary of the long run parameters in the model is reported in the table below.

Table 4. Estimated co-integrating vector resulting from Johansen procedure

VARIABLE (one co-integration)	**β**	**A**
ΔlnGDPR	1.000	0
ΔlnPIT	-.2067758 (0.004)	2.117317
ΔlnCT	.0005663 (0.980)	4.617566
ΔlnGFCF	.0781016 (0.580)	-.4128974
ΔlnLF	-2.459538 (0.000)	.5057971
Note:β - cointegrating vector and **α** - adjustment parameter vector; 1.000 - cointegrating vector is normalized with respect to the variable. ( ) represent the probability value; z - test statistic for alpha parameter and p values - probabilities for alpha .		

Source: Author's calculations.

The co-integrating vector is normalized with respect to the real GDP (GDPR). The co-integrating coefficients of the lnGFCF and lnCT are statistically insignificant. The long-run impact of the explanatory variables on real GDP as shown by table 4 is illustrated using following equation:

logGDPR = -0.2067758 lnPIT + 0.0005663lnCT + 0.0781016lnGFCF - 2.459538lnLF (3.4)
(0.004) (0.980) (0.580) (0.000)

Results of VECM denote that the variables lnCT and lnLF have positive long run relationship with lnGDPR, while lnPIT and lnLF have negative long-run relationship. However, from the explanatory variables except for lnPIT and lnLF, the others are not statistically significant. Therefore, results of beta coefficients indicate the long run relationship only between lnGDPR, lnPIT and lnLF, while the other are found to be statistically insignificant.

These results reveal that the long run determinants of real GDP are Personal Income Tax and Labor Force participation, both indicating negative long-run relationship and since only these variables are statistically significant in the long run. Corporate tax and Gross fixed Capital formation are found to be statistically insignificant, while based on the alpha parameters lnCT does not explain the short run variations on the real GDP, meaning that this variable is weak exogenous. Also it is not affected by the long term co-integration relationship.

4. RECOMMENDATION AND CONCLUSIONS

There exists a long run relationship between economic growth and direct taxes. Results of VECM denote that the variables lnCT and lnGFCF have positive long run relationship with lnGDPR, while lnPIT and lnLF have negative long-run relationship. Thus having in mind the above results of the empirical analysis, the following conclusions and recommendations are given regarding this problematic issue in Republic of Macedonia:

- Higher direct taxes reduce personal income and discourage private investment and consumption, thereby impeding economic growth.
- Higher direct taxes create incentives for agents to engage in less productive and more lightly taxed activities, leading to lower rates of economic growth.
- Taxation of both corporate and personal labor income taxation may affect entrepreneurial activity, which enhances economic growth by creating new ideas and promoting technological change.
- Impact of income taxes depends on how entrepreneurial income is taxed in individual countries; if entrepreneurial income is taxed at lower rates than personal income, high personal income tax rates encourage individuals to become entrepreneurs (self-employed) in order to avoid highly taxed personal income and vice-a-versa.

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