
PRODUCTIVE EXPENDITURES AND ECONOMIC GROWTH IN THE REPUBLIC OF NORTH MACEDONIA

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Abstract: Endogenous growth model suggests that the role of education and health in promoting economic growth is significant and positive, thus emphasizing the vital interest and importance of the policymakers regarding the productive public expenditures for fostering economic growth of their country.

There has been an increased interest among policy makers and scholars regarding the nexus between productive public spending and economic growth, with emphasizes on its effects on developing countries. In addition, this paper tries to investigate the impact of public spending on education as important tool for enhancing the economic growth of developing country such as the Republic of North Macedonia, for the time spin 2000-2018, by using Johansen cointegration, VECM and Granger causality test. Moreover, main objective is to determine if productive expenditures have positive impact on economic growth in Republic of North Macedonia as well as investigate the relationship between productive public expenditures and economic growth. Further, ADF test it is used for determining the stationarity of the time series 2000q1 – 2018q4, Johansen co-integration test has been used to determine the co- integration relationship among these variables while, VECM it is applied in determining the long-run nexus among productive expenditures and economic growth. The results of the empirical analysis reveal that the data are not stationary in their level but they become stationary in their first difference, while the results of Johansen test for co-integration indicate the existence of one co-integrating vector, thus indicating the existence of long-run significant effects of productive public expenditures in economic growth.

Moreover, such results highlight that improving education and health quality at all levels is imperative for the countries growth as well as highlight important implications for fiscal policymakers in order to foster the economic growth in the context of productive public spending.

Keywords: productive expenditures, growth, co integration, VECM

1. INTRODUCTION

The increased importance of the effectiveness of public spending and its role on the economic growth in developing countries recently has attracted the attention of many scholars and policymakers. Moreover, the composition of productive expenditures and its impact on the countries growth rate, so far has not been treated as a common analyzed issue, especially for the case of Republic of North Macedonia. Thus, the main objective is to reveal the dilemma of the effect of productive expenditures in the s growth rate of Republic of North Macedonia for the last two decades. Although it is a public choice issue the size of the public expenditures, still it composition is open to public discussion. In addition, several studies have studied the distinction among productive and unproductive expenditures, suggesting government improvements for better performance through the model of mixing.

Developing countries can meet difficulties and hard choices when undertaking fiscal adjustments, especially when it comes to the first cut component of public expenditures; so will it be education, health, defense or infrastructure? Yet, what is known so far is that in most cases, the answer depends on the contribution of each of these items on the economic growth of the country.

The objective of this research paper is investigate the effects of productive expenditures on the economic growth in Republic of North Macedonia covering the time spin 2000 – 2018, by using quarterly time series. It is widely accepted that public expenditure on infrastructure such as roads, ports, or communication systems, public research spending and the provision of basic education and medical services raises the economic potential of an economy. On the other side, governments undertake public expenditures in order to pursue several different goals, yet theory and empirical evidence does not offer clear answers to the uncertainty of the effects of productive expenditures on growth rate, which is certainly depending on the level of development and strength of the governance.

The nexus of productive expenditures and economic growth in developing countries I is highly debatable issue, still few empirical evidence exist indicating a lack of clear results, thus indicating positive, negative and no evidence of a significant relationship among the composition of productive expenditures and economic growth.

Having into consideration such results as well as the lack of a proper analysis of the composition of the productive expenditures on the economic growth in a small open economy such as Republic of North Macedonia, the main aim of this paper is to investigate the relationship of productive expenditures and economic growth in the Republic of

North Macedonia for the time period 2000 – 2018, through quarterly data, addressing such results as future suggestions for fiscal policy improvements of the country.

Finally, the structure of this paper is as follows: introduction is cover in the first section of this paper, covering the objective of the paper as well as the theories regarding the nexus of productive expenditures and economic growth; second chapter reveals the literature review of the relationship between productive expenditures and growth; the methodology and data specification of the econometric analysis is set on the third section; fourth section represents empirical results of the analysis while the last chapter suggests the recommendations and conclusions of effects of productive expenditures on the economic growth in the long run in a developing country such as Republic of North Macedonia.

2. LITERATURE REVIEW

The interest on the debate of the effects of public expenditures on economic growth in developed and developing countries is due to the existing controversy findings, suggesting an achieved agreement regarding the existence of the relationship between public expenditures and economic growth but disagreement regarding the direction of such nexus in the long run and short run and in the level of development and governance of the country.

Previous attempts to investigate the relationship among public expenditures composition and economic growth have been affected by limitations in data availability and estimation methods (Barro 1990; Easterly and Rebelo 1993). More recent empirical studies have had access to data of improved quality and as a result developed more useful variables and estimation methods (Ghosh and Gregoriou 2008; Gemmel et al. 2016). Yet, still is important to address two specific limitations that persist in current economic growth regressions: the possible endogeneity of fiscal variables and the consequences of relying on the period-averaging process to capture long-term growth rates (Bleaney et al. 2001; Kneller et al. 1999).

So far, the relationship among productive, unproductive expenditures and economic growth has been debated at several papers, however recent studies based on the exogenous growth, revealing different models of the relationship of productive expenditures with the long-term economic growth, yet results have indicated distinction among productive and unproductive expenditures (Aschauer 1989, Barro 1990).

In addition, Barro (1990), (1991) and Kneller et al (1999), have suggested empirical evidence for positive effects of productive governmental expenditures on economic growth. Further, Barro and Sala-i-Martin (1995), by using the Cobb – Douglas production function, found positive impact of productive expenditures on economic growth and negative effect of distortive taxes on economic growth. Moreover, Devarajan et al (1993) reveal in their paper that health and transport expenditures have positive effects on economic growth while education and military expenses do not show significant effects on the economic growth. In addition, Albala and Mamatzakis (2001) for Chile, have found positive and significant correlation between productive expenditures and economic growth covering the time period 1960 – 1995. Further, the data specification of this empirical analysis is based on Barro and Sala-i-Martin (1995) framework, of the composition of productive public expenditures.

Public expenditure on infrastructure such as roads, ports, public research spending and the provision of basic education and medical services raises the economic potential of economy, where influential studies such as that of Aschauer (1989) and de Haan and Romp (2007) for a recent survey of this empirical literature argued that a rise in productive expenditures increases growth. In addition, Easterly and Rebelo (1993); Canning and Pedroni (2004) also find evidence for long-run growth effects associated with public investment in infrastructure.

In addition, following the endogenous model, public expenditures on education have positive impact on economic growth in the long run while a negative effect on the short run, while on the other hand expenditure for agriculture have no effect on economic growth (Gregorous and Ghosh, 2007). In addition, expenditures on defense and health have negatively effects in economic growth in the long time period.

Further, public infrastructure can positively influence the productivity of the private physical capital explained by Caning and Pedroni (1999) in e theoretical way or as empirically shown by Zou et al (2008), Fedderke and Bogetic (2006) and Demetriades and Mamuneas (2004). Yet, the productivity of the human capital is mainly influenced by public education as shown by Bils and Klenow (2000), de la Fuente (2003), Blankenau and Simpson (2004), Creedy and Gemmel (2005)) as well as by publicly provided health services shown on the studies of Arora (2001) and Agénor (2008)). Therefore, we can say that public expenditures with general services, national defense, public order and national security, housing and community amenities represents “core” expenditures that are indeed necessary for limiting the inefficiencies induced by diverse market failures and good function of the economy.

3. MODEL SPECIFICATION, DATA AND EMPIRICAL METHODOLOGY

While addressing the empirical analysis of the relationship between productive expenditures and economic growth for the case of Republic of North Macedonia for the time period 2000q1 to 2018q4, the null hypothesis has been determined as follows:

H1: productive expenditures have positive impact on economic growth in Republic of North Macedonia.

In order to set the composition of productive expenditures, the Barro (1990) framework of public expenditures has been followed: general public services, education, health, justice, housing, transport and communication. In addition, the quarterly time series for the time spin 2000 – 2018, has been analyzed for unit root, by applying Augmented Dickey Fuller test, then Johansen test for co-integration is applied in order to check for co-integrated vectors, thus if there exist a long run relationship among these variables and VECM is utilized at the end to determine the long run effects of productive expenditures in the economic growth of Republic of North Macedonia. In addition, data are taken from official quarterly reports of Ministry of Finance and Central Bank, where the composition of public expenditures is made of productive expenditures as indicated in the following table:

Table1. Public expenditure composition

PRODUCTIVE EXPENDITURES
General public services
Education
Health
Justice
Housing
Transport and communications

Source: Barro’s model of public expenditure composition (1990)

Following the neoclassical growth theory, productive expenditures, unproductive expenditures, Gross fixed capital formation and labor force participation rate are independent variables, while real GDP is the dependent variable. In addition, time series are checked for stationarity, therefore Augmented Dickey Fuller test has been employed to investigate if time series have or not unit root in their level, thus if are non-stationary and if yes do they became stationary in their first difference. Further, Johansen test for co-integration has been used to determine whether there exists at least one co-integrating vector among the variables in the model, thus to determine if there exist a significant long-run relationship between the included variables in the following basic regression model:

$$rGDP = \beta_0 + \beta_1 Pex + \beta_2 UPex + \beta_3 GFCF + \beta_4 LF + \varepsilon \tag{1}$$

In addition, the lag structure level of the time series has been determined through FPE, AIC, SBIC and HQIC criteria. Results presented in the table2, suggest the number of lags in this model to be equal to one, due to HQIC and SBIC criteria results.

Table2. Lag structure

Lag	LR	FPE	AIC	HQIC	SBIC
0		197.90	19.477	19.543	19.645
1	386.31	1.0362	14.222	14.620*	15.234*
2	62.575	.86381	14.025	14.756	15.881
3	53.643	.84667*	13.968*	15.031	16.667
4	45.734*	.97248	14.035	15.430	17.577

Source: author’s source.

Augmented Dickey Fuller test results are presented in the following table for the level as well as for the first difference of each of variable. In addition, result reveal that the null hypothesis of the series containing unit root cannot be rejected in all cases at zero order levels. But the hypothesis of a unit root is strongly rejected for the differenced series of all variables. Taking into consideration the consistency and ambiguity of the results from this testing approach represented in the table 3, results suggest all variables to be non-stationary in their level and become stationary in their first difference.

Table3. Unit root – Augmented Dickey Fuller test

	Variable	Augmented Dickey Fuller	Comment
Level	rGDP	-2.717 (-2.917)	H₀
	Pex	-2.015 (-2.917)	H₀
	UPex	-2.022 (-2.917)	H₀
	GFCF	-2.210 (-2.917)	H₀
	LF	-2.743 (-2.917)	H₀
First difference	rGDP	-9.201 (-2.918)	H₁
	Pex	-5.961 (-2.918)	H₁
	UPex	-6.789 (-2.918)	H₁
	GFCF	-3.415 (-2.918)	H₁
	LF	-7.891 (-2.918)	H₁
Notes: † numbers in brackets represent lag length in ADF test			

Source: author's source.

Having into consideration the lag length and unit root test results discussed above, Table 4 represents the result of trace test (λ trace) statistics for the existence of long run equilibrium between productive expenditures, unproductive expenditures, GFCF, LF and real GDP growth rate. Thus, the null hypothesis of no co-integration ($r=0$) based on the trace test is rejected at (5%) level of significance and it is accepted at $r \leq 1$ for both variables, claiming the existence of one co-integrating vector between the variables, indicating a significant long-run relationship among the variables in this empirical model.

Table4. Johansen test for co-integration

Null hypothesis	Alternative hypothesis	λ - trace	95 % critical value
$r = 0$	$r > 0$	57.0358	47.21
$r \leq 1$	$r > 1$	28.6904*	29.68
$r \leq 2$	$r > 2$	6.8751	15.41

Source: author's source.

Further, table 5 reveals the findings of VECM, suggesting positive effects of productive expenditures on real GDP in the long run, while unproductive expenditures are statistically insignificant for the real GDP growth rate in the long-run in Republic of North Macedonia.

In addition, real GDP growth rate moves positively according to changes in productive expenditures, thus **we accept the hypothesis that productive expenditures have positive impact on real GDP in the long run in Republic of North Macedonia**. Further, results indicate that 1 % increase of productive expenditures will generate an increase of 0.113 % in the real GDP rate.

Table5. Vector error correction model

Variables (co-integration vector 1)	β	α
Real GDP	1	0
Productive expenditures –Pex	-0.113 (-0.012)	1.404 (0.000)
Unproductive expenditures –UPex	.0199 (0.287)	-1.157 (0.176)
Gross Fixed Capital Formation - GFCF	.0118 (0.156)	-0.0297 (0.976)
Labor Force Participation rate - LF	-.058689 0.017	2.668 0.000

Source: author's source.

In addition, Gross Fixed Capital Formation as % of GDP, tend to be insignificant in this model, while Labor Force Participation Rate have negative and significant effect on rela GDP growth rate. Further, the long run regression test results indicate the following:

$$\text{Real GDP} = 0.113\text{Pex} - 0.199\text{UPex} - 0.0118 \text{GFCF} + 0.058\text{LF} \quad (2)$$

It is also clear that the positive effect of productive expenditures in real GDP growth rate in the long run is due to investments in projects of economic infrastructure with a long term nature of the financing of the investment cycle. In addition, such findings are consistent with many other scholar's observations and findings regarding the effects of productive expenditures on the countries growth rate in developing countries.

4. CONCLUSIONS AND RECOMMENDATIONS

The main objective of this paper is to investigate the effect of productive expenditure on real GDP growth rate in a small open transition economy such as Republic of North Macedonia for the time spin 2000 to 2018. In this regard, productive expenditures composition following the Barro (1990) framework: general public services, education, health, justice, housing, transport and communication. In addition, Vector error correction model has been employed in order to address the effect of productive expenditures on real GDP growth rate in the long run. Further, it is important to indicate that in transition countries, with short spans of data and their questionable quality, the character of the empirical results is rather to be indicative than definite.

Initially, data were tested for stationarity and Johansen test for co-integration was accomplished in order to determine if there exist co-integrated vectors among the variables in this model. Empirical findings from VECM indicated long run positive effect of productive expenditures on real GDP growth rate in the Republic of North Macedonia for the time period 2000- 2018.

In addition, such positive effect of productive expenditures in real GDP rate in the long run is mainly due to projects investments of economic infrastructure (mainly highways, sanitation, energy) where the nature of such investments cycle financed by public expenditures is also in the long term. Such findings are also consistent and in line with many other authors' findings regarding the nexus between productive expenditures and economic growth in developing countries in the long run.

This confirms the paramount necessity for the changed structure of capital investment, based on the local economic impact elements (with low-cost products, increased competition in the regional export markets, chain effects and value recreated, the involvement of local potential local companies, multiplier of these commitments).

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