

PUBLIC INFRASTRUCTURE INVESTMENTS AND THEIR IMPACT ON PRIVATE INVESTMENT

(The case of Saranda)

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Abstract: *Evaluation of public investment efficiency in macroeconomic terms has increased the attention of the researchers in recent years. In this paper we concentrating on the evaluation of public investment based on the impact they have on the economic indicators and specifically the growth of private investment. Public investment at national and local level have an important role in economic growth and particularly public infrastructure contributes in increasing private investment, in the developing economies. In this regard, in our paper we get in study investment in public infrastructure and their impact on the number of private businesses in the municipality of Saranda. In the first part of this paper is treated the theoretical aspect of public investment, identification of economic indicators and evaluation of public investment on the basis of these indicators. In the second part we have treated methodology for collecting and processing data. For the realization of our paper, we are based on a statistical study of secondary data and to process them is using linear regression model. Data analysis represents the third part of the study, namely the correlation analysis of independent variables and the construction and analysis of linear regression equation, which expresses the connection of independent variables with the dependent variable. The ratio of public investment in infrastructure to public investment total, represent independent variable with the more important that we have included in our study, interest rates and the index of economic freedom represents independent explanatory variables, while number of business entities represents the dependent variable.*

KEYWORDS: PUBLIC INVESTMENT, EFFICIENCY, PUBLIC INFRASTRUCTURE, PRIVATE INVESTMENT, ECONOMIC GROWTH, CROWDING-OUT.

I. Introduction

The main objective of public investments, for each central and local government is first of all the increase of the welfare of their citizens. Maximization of these benefits in connection with economic and social impact in some way depends on the efficiency by which the public investments are transformed into output. Policy makers at central and local level and stakeholders need to operate with the concept of efficiency in the use of public investments. Evaluation of public investment, in the sense, how much they have impacted on economic indicators or social profitability provides information for stakeholders to review the decisions on the selection of alternatives for efficient use of public investments. The government can use public investment to encourage private investment. According to Keynesian economic theory, the effects of government spending are termed "Crowding-in" and "Crowding out" (of private investment). Under this concept, the increase in public investment, increased demand for resources, including factors of production such as capital and labor. This results to an increase in interest rates, the supply of capital and labor, which in turn directly affect the cost of private investment. In this way, the growth of private investment cost may result in reduced output (GDP) caused by a decline in private investment. Exist many studies in the empirical literature on the relationship between public investment, private investment and economic growth, where most of them are focused on the relationship of public infrastructure investment and economic growth. The relationship between public investment, private investment and economic growth, is a positive and important.¹

II. Public investment and impact on private investment

In simple financial aspect, public investments mean public revenues for "produce" public services. What types of public spending can be characterized as public investment? In principle, more normal difference between investment and current expenditure has to do with the longevity of productivity. So, public investment takes the form of infrastructure spending on road and rail networks, ports, bridges, power generation, telecommunications facilities, water and sanitation, government buildings, which can have a productive life in several decades.

Public investments affect directly the production of new wealth as such. for railway construction by the state, for land improvement, for afforestation etc, which have productive character, but on the other hand they have an indirect impact on the growth of the private economy by providing goods and services such as bridges, telecommunication networks, roads etc. They represent purpose economic activity, of the state and reflect the functions performed by the state in the process of its historical evolution and especially in the function of reallocation of national income that he fulfills.

Private investment considered as an important element for economic progress, but the way the measure of the impact of public policy on private investment still remains controversial. Public investment in infrastructure is believed have a positive impact on private investment. In this way, public investment can promote economic growth not only directly but indirectly they affect, by promoting private investment. The literature suggests that public investment can trigger Crowding-out private investment, leading to different conclusions, of public investment policy. This remains an important unsolved issues of policy. The literature on the impact of public investment in developing economies provides unsustainable results if it promotes or inhibits private investment.

A review in the theoretical literature shows that there are two major approaches for analyzing the effect of public investment in economic growth. The first is based on the neoclassical production function in which public capital enters as a particular input and in productivity measure that is derived from the production function. The results of Aschauer (1989, 1989b) and Munnell (1990) from annual data and state level show that public spending on basic infrastructure investments in particular, have a significant impact on production and productivity of private capital. However, subsequent studies, such as Tatom (1991), Holtz-Eakin (1994) and Evans and Karras (1994) have found that public investment has a insignificant impact on productivity. Khan and Reinhart (1990) and Khan and Kumar (1997), have found that in developing countries, although public investments contribute to increased productivity in the economy, private investments have more impact on economic growth. The second approach uses a private investment model that includes public investment to show the direct effect of public investment in private investments and also the indirect effect on growth through its effect on private investment. Studies by Greene and Villanueva (1991), with the data of developing countries,

¹ Eberts (1986), Aschauer (1989, 1989) dhe Munnell (1990)

Ramirez (1994) for Mexico, Odedokun (1997) for forty-eight developing countries, and Ramirez (2000) for a panel of Latin American countries concluded that public investments stimulate private investment. Also, Blejer and Khan (1984) for a panel of developing countries and Oshikoya (1994) for a panel of African countries have presented evidence that public infrastructure has a positive impact on private investment, while investment non-infrastructure have a negative impact on investment the private sector. If the investment in public infrastructure is complementary to private investment, the rate of return on investment in the private sector will increase, leading private sector investors to undertake more capital investment. Theoretical arguments conclude in both directions, so if public investment actually stimulate or inhibit private investment is an empirical question.

The main objective of this study in the context of assessing the economic impact of public investments is to evaluate the determinants of private investment at regional level (case Municipality of Saranda) with a primary focus on the role of public investments. The results obtained by comparing impact of public investment on private investment provides interesting results for policymakers, indicating that the impact of public investment on private investment varies depending on the stage of economic development. Public investments, mainly in infrastructure, have a positive impact on private investment in developing economies but not in developed economies.

III. The objective and the hypothesis

The main objective of this paper is to analyze and evaluate the impact of public investment in private investment infrastructure. In support of this objective, is raised hypothesis as following:

H1 – Investments in public infrastructure, have a positive impact on the growth of private investment.

IV. Methodology of the study and instruments used

In order to identify and analyze econometric connections, we are concentrating on the relationship of important variables taken in our study and exactly econometric connection of public investment and private investment.

According to, Greene and Villanueva (1991), public investments stimulate private investment. Also in their study, Blejer and Khan (1984) showed that investments in public infrastructure have a positive impact on private investment. To confirm or denying this relationship, we used the connection of these variables through a linear regression equation. The methodology used in this case is a multiple regression because we have more than one independent variable.

The growth of private investment, as measured by the increasing number of businesses is a dependent variable, while public investment in infrastructure in ratio to total public investment is the independent variable most important for our study. But it is understood that to make the most complete analysis of our study, we need to include other variables determinant of private investment.

By Greene and Villanueva, the interest rate is considered as a determinant of private investment in the economy. According to him, the connection of private investments and interest rate is negative connection. This variable includes average rates of interest for business loans for a period of 2002-2014.

Dawson (1998), has used the economic freedom index by Gwartney, Lawson and Holcombe (1999), as a factor that influences the private investment in economy. In this way, in our study we included as a determinant of private investment, the average interest rate and the index of economic freedom as independent variables.

In this case the formula is as follows:

$$NSB = C + \beta_1(IPIvIPT) + \beta_2(NMI) + \beta_3(ILE) + \varepsilon$$

Where :

NSB – the number of business subjects

IPIvIPT – ratio of investments in infrastructure to total public investment

NMI – average interest rate on loans

ILE – the index of economic freedom

In this way define the following variables: number of business subjects is used as the dependent variable (NSB) in mathematical equation (1). The explanatory variables are: the ratio of public investment in infrastructure to total public investment (IPI / IPT), average rates on loans business (NMI), the index of economic freedom (ILE),

To obtain the results is using SPSS version 21, regression analysis. For this study were obtained data for all dependent and independent variables, for a period from 2002 to 2014, so the number of observations is 13.

The main source of data collection is mainly used, the Office of Information and Statistics in Saranda Municipality and other national sources. Specifically, information on the value of ILE (Economic Freedom Index) is provided by the OCED publications and information on NMI (the average interest rate) loans business is provided by the publication of the Bank of Albania. The data that estimate the level of private investment, are expressed in number of business subjects (NSB). These data express, numerical values of the dependent variable in the econometric model.

IV. Analysis of data

For the successful implementation of this paper and hypothesis testing, we have made a statistical processing of the data with the help of statistical program SPSS version 21, by analyzing two statistical perspectives:

(i) correlation connections;

(ii) mathematical connections between the dependent variable and independent variables;

Connections correlation are expressed in bivariate correlations table (Table 4.1).

Table 4.1. Correlation of variables

		Correlations			
		NSB	IPIvIPT	ILE	NMI
Pearson Correlation	NSB	1.000	.976	.972	-.354
	IPIvIPT	.976	1.000	.959	-.495
	ILE	.972	.959	1.000	-.310
	NMI	-.354	-.495	-.310	1.000
Sig. (1-tailed)	NSB		.000	.000	.118
	IPIvIPT	.000		.000	.043
	ILE	.000	.000		.151
	NMI	.118	.043	.151	
N	NSB	13	13	13	13
	IPIvIPT	13	13	13	13
	ILE	13	13	13	13
	NMI	13	13	13	13

Source: Output i SPSSv21

In correlation table (Table 4.1.), note that the dependent variable NSB, correlate strong in terms of significance with two independent variables, IPIvIPT ($p = 0.000$) and ILE ($p = 0.000$). Their correlation is positive and high levels respectively, CCP (IPIvIPT) = 0.976 and CCP (ILE) = 0.972. These values of CCP are in risk levels of multicollinearity. For this reason, in the program's executive we have diagnosing the multicollinearity

(Table 4.2), which shows that variable multikolineare ILE creates effects, with the dependent variable NSB, therefore it is excluded from the mathematical relationship. While IPIvIPT variable is a variable with a strong positive correlation with the dependent variable NSB. NMI dependent variable has a negative coefficient (CCP (NMI) = - 0354), which shows a negative correlation with the dependent variable, but with a Significance over allowed norms of acceptable statistical significance (p = 0.113).

Table 4.2. Verification of multicollinearity between variables

Collinearity Diagnostics ^a						
Model	Eigenvalue	Condition Index	Variance Proportions			
			(Constant)	IPIvIPT	NMI	
1	1	1.996	1.000	.00	.00	
	2	.004	21.533	1.00	1.00	
2	1	2.980	1.000	.00	.00	.00
	2	.018	12.960	.00	.16	.36
	3	.002	40.049	1.00	.84	.63

a. Dependent Variable: NSB

Source: Output of SPSSv21

In the study and analysis, the mathematical relationship between the dependent variable and independent variables, we used linear regression model, with the method "stepwise". Through this method, the program includes in the mathematical model only the variables, that provide sufficient significance by F test (Table 4.3). Thus is observed that the variables included in the model are variable IPIvIPT (p = 0:00) and NMI variable (p = 0.013) (Table 3).

Table 4.3. F test variables

Variables Entered/Removed ^a		
Model	Variables Entered	Method
1	IPIvIPT	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
2	NMI	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: NSB

Source: Output of SPSSv21 Method "stepwise" has determined, regression coefficients through testing with two steps of variables, and in the second step have a coefficient of determination very good (R2 = 0,975) and a level of significance (statistically significant) test F, within the limits of the permissibility statistical (p = 0.013).

In mathematical equation it is observed that independent variable IPIvIPT has an impact almost 1.5 times higher than NMI independent variable. Specifically, if, keep unchanged the value of NMI and increase by one unit IPIvIPT ratio, accurately 95%, then the number of businesses would increase by 78.

Table 4.4: Mathematical equation coefficients

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-3510.530	326.468		-10.753	.000
	IPIvIPT	72.037	4.806	.976	14.987	.000
2	(Constant)	-4574.424	432.443		-10.578	.000
	IPIvIPT	78.285	4.205	1.061	18.618	.000
	NMI	54.367	18.095	.171	3.004	.013

a. Dependent Variable: NSB

Source: Output of SPSSv21

By the data in Table 4.4, the mathematical equation (2) as follows:

$$N\hat{S}B = -4574.424 + 78.285(IPIvIPT) + 54.367(NMI) + 0.000(ILE) + \varepsilon \quad (2)$$

Significant influence and with greater accuracy, which is derived from strong and more significance correlation, of the report IPIvIPT as compared with independent variable NMI is also evident from the comparison of standard errors (Table 4.4). Thus, the standard error in the estimation of the regression coefficient for IPIvIPT is $\varepsilon_1 = 4.205$, whereas, for the variable coefficient NMI is $\varepsilon_2 = 18.095$. These errors reflect the confidence intervals of different lengths with a 95% certainty, namely: $\beta_1 \in (68.916; 87.654)$ dhe $\beta_2 \in (14.048; 94.685)$. This fact is associated with the interpretation that the strength and accuracy predictive mathematical model is better, if predictive assessment of private investment growth (NSB), based on the values that could take IPIvIPT ratio.

V. Conclusions

The analysis, identification and assessment of efficiency of public investment, is a necessity for maximizing their effects on economic and social indicators.

The level of public investment efficiency, in the sense how they have influenced economy or social profitability, provides information for interested parties to review the decisions on the selection of alternatives for efficient use of public investments.

The impact of public investment in private investment represents a long-term indicator of the efficiency of public investments.

Public investments, develop significant economic and social effects, to the community where they are undertaken.

In the theoretical aspect economic effects of public investment were seen divided in two opinions. On the one hand the positive effect that they have on economic growth in developing economies and on the other hand that they have inhibitory effect on growth in developed economies.

Increased investment in Saranda municipality has positive effects on private investment and was noted that they are encouraging them. This shows that the inhibitory effect does not happen in emerging economies such as the Saranda municipality which is in the early stages of tourism development.

Significant is the index of economic freedom. Freedom of business and entry into biznez facilities, have a positive effects on the growth of private investment, especially investment in tourism businesses.

According to the theory, investments in infrastructure are considered more productive and have significant economic impacts.

Infrastructure investments, constitute about 60% of total public investments. It has resulted in significant effects on private investment.

The existing literature provides conflicting conclusions about the impact of public investment in private investment. In developing economies, the literature suggests that public investments stimulate private investment and the others suggest that public investment cut private investment.

The results of our study suggest that public investments have a positive impact on private investment in developing economies such as the Albanian economy.

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