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Article

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Management dynamics in the knowledge economy

Provided in Cooperation with:

National University of Political Studies and Public Administration, Bucharest

Reference: Ziberi, Besime Fekri/Miftari, Florije et. al. (2021). The econometric approach of the impact of public investment in the road-infrastructure in the economic growth of Kosovo. In: Management dynamics in the knowledge economy 9 (1/31), S. 5 - 16.

<http://www.managementdynamics.ro/index.php/journal/article/download/410/358>.

doi:10.2478/mdke-2021-0001.

This Version is available at:

<http://hdl.handle.net/11159/6040>

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The Econometric Approach of the Impact of Public Investment in the Road-Infrastructure in the Economic Growth of Kosovo

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Abstract: Economic growth and public investments are considered the most challenging problems faced by most countries around the world, including Kosovo. Various assumptions have been made that better and higher-quality transport is essential for the country's economic development. This study aims to analyze the relationship and the impact of public investments in road infrastructure on Kosovo's economic growth taking into analysis also other macroeconomics aggregates such as Consumption, Investment, Exports, and Imports. Two important aspects have been addressed within the extensive literature review, namely theoretical analysis of different studies elaborating on elements regarding infrastructure in general, such as social and economic infrastructure, and road infrastructure in particular. To analyze the impact of public investments in road infrastructure and other macroeconomics aggregates over Kosovo's economic growth, the econometric multiple regression model Ordinary Least Squares (OLS), the Pearson Correlation, and the Test for heteroskedasticity have been applied. The data used is secondary data obtain from the World Bank Indicators, Kosovo Agency of Statistics, and the Official Gazette of the Republic of Kosovo. All these models are tested with the STATA software program. Based on regression analysis, we can conclude that public investments in road infrastructure for Kosovo's economic growth are non-significant as their effect is manifested in the long run, but all the other independent variables from the OLS model are significant and impact the GDP growth of Kosovo. The study comes with some other conclusions, suggestions and opens paths for future researchers.

Keywords: road infrastructure expenditures; economic growth; consumption; FDI; investment; export; import.

Introduction

Public investment plays a crucial role in sustainable economic growth and development. Public investment in infrastructure has been at the center of academic debate and policy-making in recent years. An adequate infrastructure, both social and economic, is considered a key factor of sustainable economic growth and development. Public infrastructural investments are categorized into two main pillars such as economic infrastructural investments and social infrastructural investments (Zachariadis, 2018). Economic infrastructure is defined as infrastructure that promotes economic activity, such as roads, highways, railroads, airports, seaports, electricity, telecommunications, water supply, and sanitation. Social infrastructure is defined as infrastructure that promotes the health, education, and cultural standards of the population – activities that have both a direct and indirect impact on the quality of life (Fourie, 2006). The investments in public sector infrastructure affect overall economic development through (i) direct investment in economic infrastructure that facilitates the production process and stimulates economic activities in the country, (ii) improves competition by reducing transaction and trade costs, and (iii) generates employment opportunities for the poor (Javid, 2019).

How to cite

Ziberi, B., Florije Miftari, F., & Omaj, L. (2021). The Econometric Approach of the Impact of Public Investment in the Road- Infrastructure in the Economic Growth of Kosovo. *Management Dynamics in the Knowledge Economy*. 9(1), 5-16, DOI 10.2478/mdke-2021-0001
ISSN: 2392-8042 (online)
www.managementdynamics.ro
<https://content.sciendo.com/view/journals/mdke/mdke-overview.xml>

World Bank Group (2019) reports among other states that Kosovo's economic growth of 4.2% is addressed to investments in public infrastructure and consumption. Also in the report from European Investment Bank (Holzner & Schwarzhappel, 2018) is stated that road improvements can substantially impact the cost structure of companies well as their productivity. Public investment is a priority of the 2030 Development Agenda, also mentioned in three of the seventeen Sustainable Development Goals. Investing in infrastructure is often presented as a solution to several problems such as unemployment, depopulation of rural areas, and low economic activity (Holmgren & Merkel, 2017)

Thus, substantially hiking up investment in traditional as well as non-traditional infrastructure in the Western Balkans without dramatically increasing the countries' indebtedness is the primary duty to achieve higher long-run productivity growth and provide the population a perspective for a better future without a need to migrate. (Grieverson & Holzner, 2018). Thus bridging infrastructure gaps would require a broad set of actions to improve the efficiency of public spending, mobilize domestic resources and support from development partners, and crowding in private investment (Gurara, Klyuev, Mwase, & Presbitero, 2018). The quality improvements in roads and railways and the structural upgrading of transport infrastructure significantly contribute to growth. (Ke, Lin, Fu, & Wang, 2020). In particular, we have the political and institutional factors that provide broader contexts within which decisions are made on various investments. Certainly, the expectations that public investment in road infrastructure will be the main pillar towards economic growth differ from the point of view of the country economic development. Additionally, the link between infrastructure spending and infrastructure building could be very weak in cases where public investment efficiency is low due to poor project selection, non-transparent procurement processes, and corruption. Government investment is half or more of total investment so in many countries, government investment spending has created little useful capital (Pritchett, 2000). Kosovo as a developing country determines priorities to invest in road infrastructure as a pillar towards economic growth, however, many researchers believe that countries with similar levels of socio-economic development and physical and social infrastructure, often display different levels of economic performance (Mahroum, 2011) .

In low-income countries, infrastructure shortages remain major and often an obstacle to long-term economic growth compared to developed countries, where increases in infrastructure investment remain one of the main factors that can support economic growth. They also contribute to the well-being of the country as a result of the need that a country may have for infrastructure investments. One of the reasons why the infrastructure has attracted so much attention as an instrument to strengthen the competitive positions of countries and regions in Europe is that the creation of a common market has led us to the inequality of a large number of government policy instruments. The presence of a certain basic infrastructure can be important in attracting the initial interest of potential new investors, the success in earning domestic investment projects increasingly depends on the ability of public authorities to produce spaces that are tailored to the changing needs of leading firms.

From the perspective of the importance of public infrastructure investments in developing countries, the main aim of this study is to analyze and reflect the trend over the years of public road infrastructure investments in Kosovo and measure their impact on Kosovo's economic growth through econometric models including other macroeconomic aggregates in relevance and compliance with the theoretical and empirical literature considered in this study. We also highlight the main limitations in this study as is focused only on a country – Kosovo; thus, the number of observations in the empirical model is small. This study, due to the nature of the research, which is explanatory and comparative research addresses a very specific topic that is of great interest to academics as well as researchers in the field in general and policy-making in particular. Thus the study aims to analyze the impact of public investment on road infrastructure in the case of Kosovo. Also, good management of public finances by the relevant authorities would result in the management of good capital investment, designing well-planned budgets, and reviewed

by various experts. After the recent war in Kosovo, the government worked hard to build, rehabilitate and maintain roads, but we think more importance should be given to road assets that contribute to the rehabilitation and reconstruction of previously built roads. The study is organized as follows: the second section presents the review of related literature where broadly international literature is discussed and presented. Section three present the methodology and the data used in this study, section four go through results and discussions and in section five the study highlights the conclusions and come with further recommendations.

Literature review

The better the transport infrastructure is developed, the greater the competition and freedom of economic activity, the greater the opportunities for enhancing the conditions and living standards of the population in any country or region, (Kuzmina-Merlino, Skorobogatova, Schmidtke, & Behrendt, 2018). Another study indicates that governments should consider more funding road transportation infrastructure through its budgetary allocation. Additionally, decisions should be considered related to quantifying designed alternative source of funding (property tax) that can be harnessed via capturing the increase in property investment returns (Yakubu, Adeyemi, Sule, & Ogunbajo, 2020). Studies show that developing economies invest less on schools than on roads, both in relative and absolute terms, as a fraction of GDP (Atolia, Li, Marto, & Melina, 2017). A study from (Nyasha & Odhiambo, 2019) stated that is a greater chance that the impact of government spending can lead to the growth of the real sector, especially when expenditure is on growth-enhancing activities such as domestic public investment that crowds-in private investment – such as targeted economic infrastructure development study showed that national competitiveness is influenced basically by the level of institutional development and other seven factors, including infrastructure, in turn, infrastructure factor is determined mainly by the quality of roads, railroad infrastructure, air transport and electricity supply (Palei, 2015) The latter is mainly determined by electricity supply, roads quality, railroad infrastructure, and air transport.

According to (Snieska & Simkunaite, 2009) each country determines the set of infrastructure components and the aspect of impact on social and economic development: economic growth, income inequality, output, regional competitiveness, labor productivity, and welfare. Regarding (Miftari & Ziberi, 2019) which have researched public spending based on the OLS model have concluded that governments to contribute to economic balances, job creation, and increased productivity tend to increase public production spending by undertaking long-term activities in the field of public investment, respectively public, health and educational infrastructure, as well as in the field of research and development. The goals of regional development policy usually include creating the necessary conditions for a strong economic structure and stimulating the growth of productive activity thus the developmental impacts of infrastructure investment turn out to be modest but positive on all aspects of development; Second, there needs to be a sufficient level of productive activity to take advantage of the complementary relationships, and no amount of investment in core infrastructure is capable of overcoming disadvantaged locations; Third, because the relationship between investment and growth is interdependent, development pressures may be efficient investment triggers. (Guild, 2000) One of the ways to achieve these goals can be investments in road infrastructure as infrastructure contributes to the development of the manufacturing sector by increasing productivity and attracting Foreign Direct investments (FDI). Transportation and its services, which are well improved, also reduce production costs, and in addition to attracting foreign investors help firms previously created to expand, even more, especially where the infrastructure is abundant and reliable it is expected that well-performing infrastructure will help drive a more diverse, competitive and sustainable economy that generates substantial and lasting economic, social and environmental benefits. (Temjanovski, Dimitrova, & Gorgieva-Trajkovska, 2016)

Methodology and data

This paper used a broad theoretical and empirical literature review in the field of public investments in general and road infrastructure public investments in particular. Based on the literature review both theoretical and empirical, this study has been modified and adapted the econometric model Ordinary Least Square Regression (OLS) to measure the impact of infrastructure-road public investment, consumption, foreign direct investment, export, and import in the economic growth of Kosovo. In our research, we go through theoretical analysis, including an overview of the rich literature on investment in general and road infrastructure public investments in particular as a basis for empirical analysis. Based on the review of related literature, we adapt the econometric model multiple regression analysis Ordinary Least Square Regression (OLS). The data that is used in this paper is secondary data taken from the annual reports of the World Bank, Central Bank of Kosovo, Tax Administration of Kosovo, Newspaper Official of the Republic of Kosovo, and the Kosovo Agency of Statistics. Both of these research aspects are integrated into each other's support, so through theory, the basis for empirical and reverse research has been created. The multifactorial econometric model is modified and adapted in this study using the STATA software program for estimation.

Econometrics uses economic theory, mathematics, and statistical inference to quantify economic phenomena thus applied econometricians, by contrast, use econometric techniques developed by the theorists to translate qualitative economic statements into quantitative ones (Stock & Watson, 2006). Regression analysis is one of the most used and most powerful multivariate statistical techniques for it infers the existence and form of a functional relationship in a population (Mahbobi & Tiemann, 2010).

Simple regression is assumed to be a real link between Y and X for all possible values they can take on and is known as the function of population regression. In its structure, it includes the determining part and the term error. Simple regression can be assessed using the Small Square Method, under certain conditions to generate unbiased and efficient estimators. The Regression equation is used to estimate the dependent variable (Y) based on the independent variable (X). the variable appearing on the left side of the equality sign is called the dependent variable and the variable(s) on the right side is called the independent, or explanatory, variable(s) (Gujarati & Porter, 2020)

$$y_i = \beta_0 + \beta_1 X_1 + \mu_i \quad (1)$$

In our concrete case, we have built the multifactorial regression model, which takes the following form

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n + \mu \quad (2)$$

The second equation is multifactorial regression when the variable appearing on the left side of the equality sign is called the dependent variable and the variable(s) on the right side is called the independent, or explanatory, variable(s) when β_0 is the Constant, $\beta_1, \beta_2, \beta_3$ are the parameters and X_1, X_2, X_3 are the independent variables were the μ_i is the error term. The Conceptual variables in our model include the Gross Domestic Product as the dependent variable and on the other hand the consumption, export, public investment in road infrastructure, Foreign Direct Investment and import as independent variables. In the following section, we go through the results of the econometrical model.

Results

In this section, are elaborated the results from the econometric model (OLS), the test for heteroskedasticity, the histogram, and the Pearson Correlation Matrix.

Table 2. Results of Coefficient of determination R in OLS Model

<i>Number of observation</i>	9
<i>F (5,3)</i>	14.50
<i>Prob > F</i>	0.0000
<i>R-squared</i>	0.9997
<i>Adj R-squared</i>	0.8437
<i>Root MSE</i>	22339

Source: Author's calculations

Regarding the results obtained from the STATA program, we can conclude that the model is significant with R – square 0.9997, which means that the independent variables explain the dependent variable in this econometric regression model. The determinant coefficient R means that the model is significant and over 99% explains the influence of the independent variables on the dependent variables. Based on the findings from the Stata software program on the multiple econometric models we evaluate the significant and highly significant model with the Adjusted R – squared 0.8437 which means that the model is important. The overall goodness of fit of the regression model is measured by the coefficient of determination, r^2 . It tells what proportion of the variation in the dependent variable, or regressand, is explained by the explanatory variable, or regressor. This r^2 lies between 0 and 1; the closer it is to 1, the better is the fit. (Gujarati & Porter, 2020, p. 106)

Table 3. Ordinary Least Square Regression (OLS)

	<i>Coef.</i>	<i>Std.Err.</i>	<i>T</i>	<i>P> t </i>	<i>[95% Conf. Interval]</i>
Consumption	.9971208	.0322939	30.88	0.000	8943472
Exports	1331245	1214105	35339	0.002	.9448621
Public Investments in Road Infrastructure	(.0001703)	.0000724	-2.35	0.100	(.0004008)
Foreign Direct Investments	.0007203	.4.22	0.024	.000177	.0012637
Import	(.6911694)	.0826794	(8.36)	0.004	(.954292)
_cons	69163.84	114621.9	0.60	0.589	(295614.1)

Source: Author's calculation's

In table 3, we present the results from the regression analysis, as we explained in the above section, the model is modified and adopted regarding economic theory. The importance of the independent variables is presents based on the p-value thus the equation remain as follows:

$$GDP = 69163.84 + .9971208Consumption + 1.331245 Export - 0001703Investment in road infrastructure + .0007203FDI - 6911694IImport + \mu \quad (3)$$

Public Investments in road infrastructure has the p-value 0.100 which means that in our model's conditions the variable does not meet the p-value criteria less than 0.05 and in this case, it turns out to be insignificant and does not clarify the impact on GDP. Based on the theory of economic growth, these results are expected because the impact of investments in the road - infrastructure is expected to show effects in the long run as a result of the public expenditure multiplier.

Foreign direct investment in our case has a p-value of 0.024 which means a positive and significant effect; thus, the increase in foreign direct investment per unit will cause an increase of GDP by 0.007203. These findings are in line with economic theory, as it is expected that the increase of foreign direct investment, especially in developing countries, impact the GDP growth positively. Another study from (Ziberi & Avdiu, 2020) using the Ordinary Least Square (OLS) method, utilizing secondary data from World Bank Indicators from 2001 till 2018 concludes that in Kosovo, for the period (2001–2018) the relationship between Export and Unemployment rate is significant, namely the increase in export by 1% will reduce the Unemployment rate to (1,154) while the relation between Foreign Direct Investment and Unemployment rate results negative as growth for 1% of Foreign Direct Investment will increase the Unemployment rate to 1.25. The import variable with p-value 0.004 meets the required p-value condition less than 0.05, so it is significant, which means that the increase of imports per unit will negatively affect the GDP in the amount of -6911694. Even these findings are in line with the theory of economic growth since the increase in imports results in a decrease in GDP. Regarding the results of the test for heteroskedasticity Breusch-Pagan / Cook-Weisberg test for heteroskedasticity; H_0 : Constant variance; Variables: fitted values of GDP $\chi^2(1) = 0.06$ Prob > $\chi^2 = 0.7995$ we see that the model is important and there is no problem of heteroskedasticity.

In the table below we present the results found by the Pearson Correlation Matrix.

Table 4. Pearson Correlation Results

	GDP	Consumption	Export	Inv.road infr.	FDI	Import
GDP	1					
Consumption	0.9946	1				
Export	0.9627	0.9412	1			
Inv. road infr.	0.2904	0.2667	0.3574	1		
FDI	(0.6363)	(0.6792)	(0.5288)	(0.2303)	1	
Import	0.9281	0.9149	0.9729	(0.2623)	(0.4186)	1

Source: Author's calculations

In table 4 we have presented the correlations between the variables defined in the research including GDP, Consumption (C), Export (E), Infrastructure-road investments (Iexpen), Foreign Direct Investments (FDI), and Import (I). Correlations evaluate the strength of the linear relationship between two (and only two) variables. Correlation coefficients range from -1.0 (a perfect negative correlation) to 1.0 (a perfect positive correlation). Based on the Pearson Correlation matrix, we see that GDP is positively correlated with consumption, export investment in road infrastructure, and import but is in a negative relationship with FDI.

Consumption is strongly and positively correlated with exports 0.9412, and consumption is positively correlated with the variable public investment in road infrastructure 0.2667 coefficient value, consumption is negatively correlated with foreign direct investment in the amount of - 0.6792 and in a strong and positive relationship with imports at Pearson coefficient value 0.9149. Exports are positively correlated with public investment in road infrastructure in the strength of the average connection with the Pearson coefficient 0.3574, in negative relation with foreign direct investment in the value of the Pearson coefficient 0.5288, and a strong and positive relationship with import in the amount of 0.9729. Public Investments in road infrastructure are negatively correlated with foreign direct investment in the Pearson coefficient value of 0.2323 but positively correlated with the average relationship with imports in the Pearson coefficient value 0.2623. Foreign direct investment is negatively correlated with imports in the Pearson coefficient value of 0.4186. From the Pearson correlation matrix what we can emphasize and is important in the study is the positive relationship between the export variable and the variable

investment in road infrastructure as based on the review of theoretical literature and economic literature, road infrastructure has a positive impact on increasing exports to the outside world.

In the following section, we will present the macroeconomics aggregates for Kosovo for the period 2010-2018 such as the trends of Gross Domestic Product, Consumption, Export, Public investments in road infrastructure, Foreign Direct Investments and import.

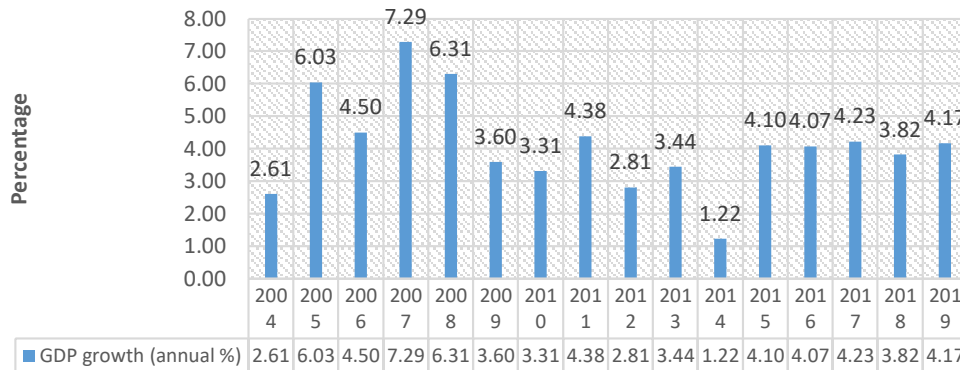


Figure 1. GDP growth (annual as a percentage)

(Source: Secondary data from the annual reports of the World Bank, author's calculations, <https://data.worldbank.org/indicator>)

In figure one, we can see the economic activity of Kosovo during the years 2010-2019. GDP growth rate in 2011 has a positive trend; the value reached is 4.38%.

The main carrier of economic growth in the country in 2011, was the private sector through increased consumption and investment, while public sector investments also played an important role in the economic growth of about 1.22% compared to other years, where investments and net exports are estimated to have contributed negatively. In 2018 the GDP growth rate was 3.8 and in 2019 increased to 4.1. While in general, we see that Kosovo during these years had economic growth with positive rates despite the challenges caused by fluctuations in the global economy and especially in Europe.

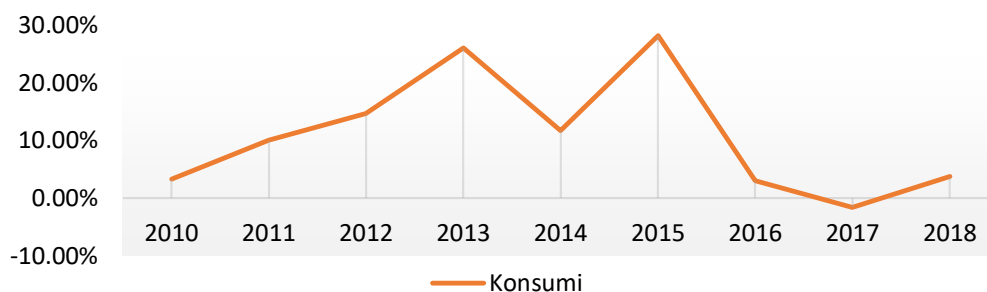


Figure 1. Real annual Consumption growth rate (2010-2018)

(Source: Secondary data from the annual reports of the World Bank, author's calculations, <https://data.worldbank.org/indicator>)

In figure 2 is presented the real annual Consumption growth rate for the period (2010-2018) for Kosovo. We can see that consumption had the highest positive rates in 2013 at around 26%, exactly where economic growth during this year as a result of increased domestic demand, i.e. private consumption and investment. The real growth rate of consumption during these years marked the highest value of 28.10% in 2015, while in 2017 within the domestic demand, the overall activity in the country was supported by the strengthening of the investment position, It was characterized by a decrease where the lowest rate was around -1.60%.

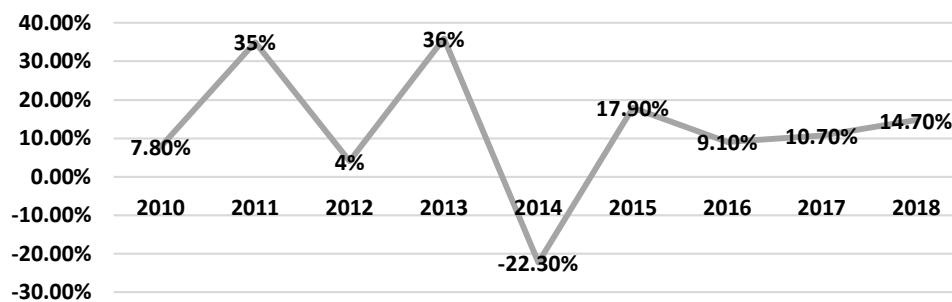


Figure 2. Real annual investments growth (2010-2018)

(Source: Secondary data from the annual reports of the World Bank, author's calculations, <https://data.worldbank.org/indicator>)

In figure three, we present the data for real annual investment growth for Kosovo for the period 2010-2018. Even Kosovo made the largest investment in 2013 with a positive rate of about 36% where the main contribution to the growth of this component was the private sector and according to the Central Bank of Kosovo is estimated to be the result of increased foreign direct investment (FDI) and investment loans, exactly three years after 2010 wherein that year the largest investments that were made belongs to the road infrastructure (Morine-Merdare highway). In terms of investment, for the period 2010-2018 we generally see that we have a positive growth trend, where unfortunately only in 2014, Kosovo marked a decline in investment at a negative rate of -22.3%.

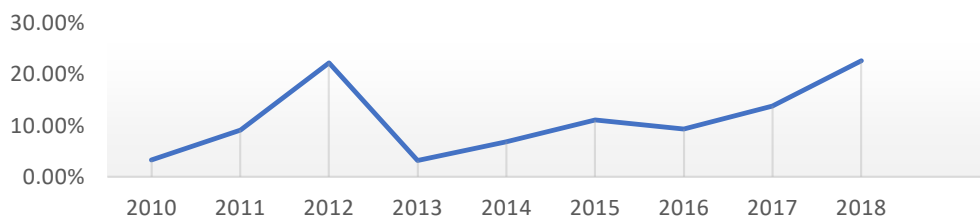


Figure 3. Real annual growth of state budget expenditures

(Source: Secondary data from the annual reports of the World Bank, author's calculations, <https://data.worldbank.org/indicator>)

In terms of budget expenditures, almost all categories of budget expenditures were characterized by growth. 2012 and 2018 are characterized by the highest annual growth rate of budget expenditures over 22%. While only the beginning of 2010 and 2013 are characterized by lower rates in terms of budget expenditures, at rates of about 3 Most of the capital expenditures during these years were aimed at infrastructure investments.

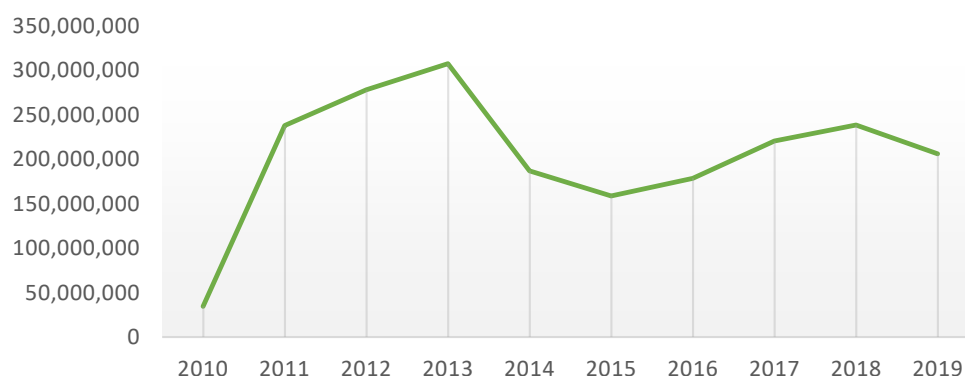


Figure 4. Public Investments in Road Infrastructure (2010-2019)

(Source: Secondary data from the annual reports of the Official Gazette of the Republic of Kosovo, calculated by the author himself, <https://gzk.rks-gov.net/Default.aspx?index=1>)

In figure five, we can see that the public investments in road infrastructure marked the largest values exactly in 2011, 2012, and 2013 during the investments in the two largest infrastructures. And after 2013, infrastructure-road expenditures began to decline in value. Below we have graphically presented the real growth of exports to Kosovo during the period 2007-2019.

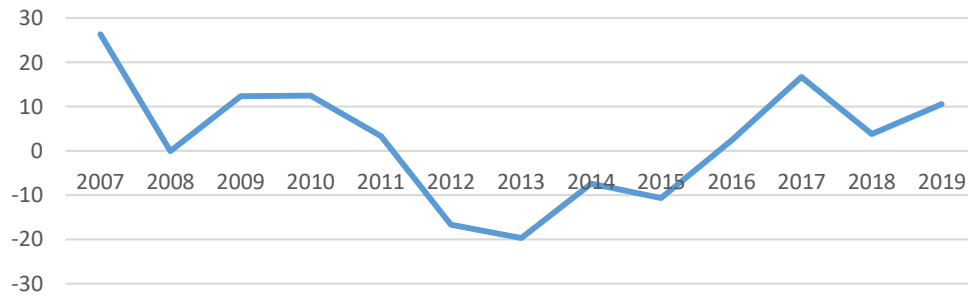


Figure 5. Real Annual Export Growth (2007-2019)

(Source: Secondary data from the annual reports of the World Bank, author's calculations, <https://data.worldbank.org/indicator>)

Regarding export as a macroeconomic variable and part of GDP, it is worth noting that during 2007-2019 export of goods and services (annual as a percentage) in the case of Kosovo indicates a fluctuation trend. As a result, the increase in the price of metals that followed in 2010 affected the increase in production and was reflected in the increase in volume and sales value as about 90 percent of the metals were exported from Kosovo.

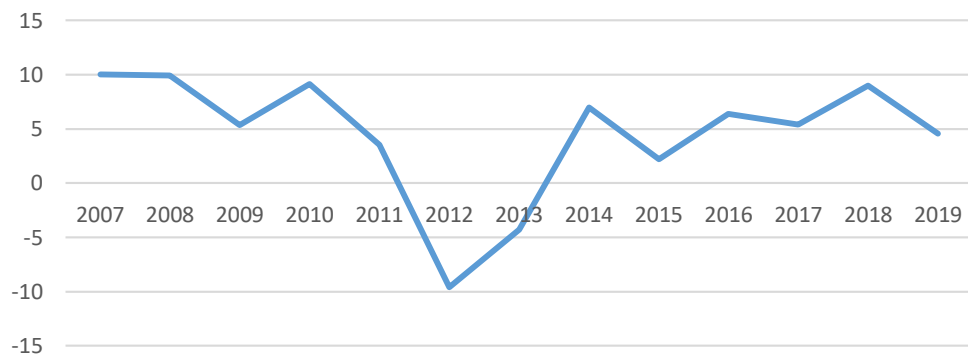


Figure 6. Real annual Import growth (2007-2019)

(Source: Secondary data from the annual reports of the World Bank, author's calculations, <https://data.worldbank.org/indicator>)

In figure 7, we have the data for Imports in Kosovo for the period 2007-2019. From the above figure, we can see that imports in our case of analysis have fluctuations trend. From 2007 till 2009 the trend was decreasing. In 2007 the import was 10.00 in 2009 the trend decreased and reached to 5.35.

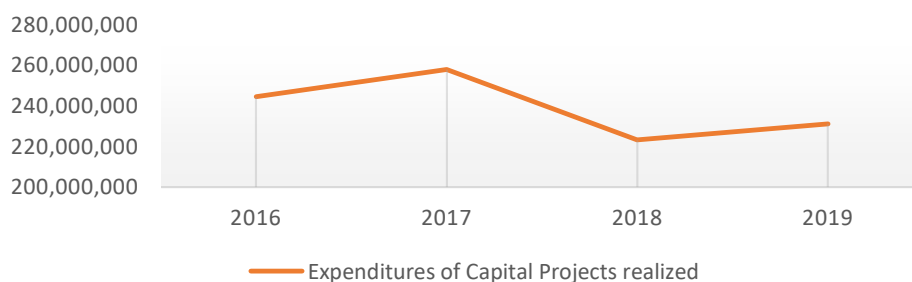


Figure 7. Expenditures of Capital Projects realized in Kosovo (2016-2019)

(Source: Secondary data from the annual reports of the Official Gazette of the Republic of Kosovo, calculated by the author himself, <https://qzk.rks-gov.net/Default.aspx?index=1>)

Regarding the expenditures in capital projects in infrastructure-road investments, we see that 2016 and 2017 were the highest investment values, while during 2018 and 2019 the values were lower than the expenditures in capital infrastructure-road projects. We should mention that the largest projects that were realized during the years were the two largest highways, Morine-Merdare and Prishtina-Hani i Elezit.

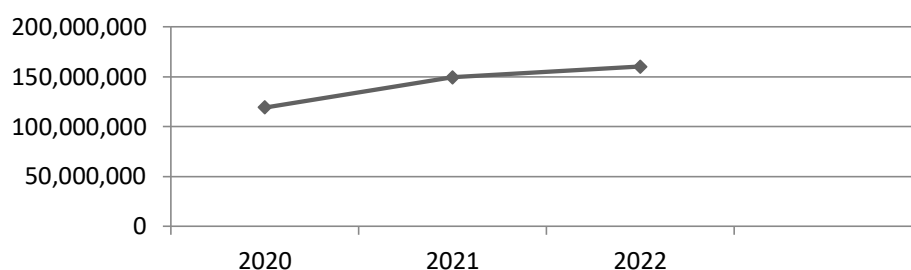


Figure 8. Expenditures of Planned Capital Projects 2020-2022

(Source: Secondary data from the annual reports of the Official Gazette of the Republic of Kosovo, calculated by the author himself, <https://gzk.rks-gov.net/Default.aspx?index=1>)

Discussion and conclusions

Investment in infrastructure is closely linked to the Gross Domestic Product. In the short term, investment in road infrastructure stimulates demand, creating employment in similar construction and industries such as manufacturing and materials. In the long run, it increases the productive capacity of an economy. Thus a new route can facilitate more trade and is likely to support even more work long after the project is completed. Investment in road infrastructure has become a mandatory investment for any country in transition. When we talk about the impact of investments in road infrastructure on the economic development of the country, we are talking about those countries that have provided a safe infrastructure for employment development and balancing the change of the market with which a good development base has been created. Thus, we can conclude that a significant part of the Kosovo budget is dedicated to investments in road infrastructure. Particular attention should be paid to firms that win tenders for road construction, especially highways. They should have more special controls on fund management, spending, etc. Based on statistical analysis, we see that Kosovo paid special attention to investments in road infrastructure, road construction, and highways. The main goal of any macroeconomic policy is to have economic development and reduce the level of unemployment, as these two are known as indicators that have an important role in the economic growth of any country. Regarding public investments in road infrastructure, based on statistical analyses made above, we saw that they play an important role in the country's economic development, in macroeconomic indicators such as GDP, consumption, investment, export, and import. Therefore, the goal of this paper was to present the relationship and impact between macroeconomic indicators and public investment in road infrastructure.

Based on the results from the Pearson correlation matrix, what we can emphasize and is important in the study, is the positive relationship between the export variable and public investment in road infrastructure. Road infrastructure has a positive impact on increasing exports to the outside world. And in the end, based on the results obtained above, we saw that public investments in road infrastructure in Kosovo are insignificant (in our model conditions) as their effect is seen in the long run. The Government of Kosovo must ensure that accurate information about projects related to public investment is easily and understandably accessible to the public regularly, for example, one of the possible ways would be to be involved. Of this information on websites related to the publication of public investments, another way would be to organize public meetings with citizens periodically. The Government of Kosovo must ensure that it provides accurate

information on the financial cost and funding sources of the projects in question. Many infrastructure networks extend beyond borders, so it is essential to ensure better coordination of investment projects.

Countries around the world, including Kosovo, should not jeopardize their overall macroeconomic stability with over-ambitious or weak public infrastructure projects. Compromises between economic growth, inflation, and current account deficits should be a key element of any political discussion in any place. We recommend for policymakers to improve government policies that deal with employees so that they are as effective as possible, also should be pursued investment policies in education and health, as well as to design various professional training of human capital, to have a lower level of unemployment in the future. The main limitation of this study is the number of observations in the model thus a lack of data.

References

- Atoli, M., Li, B. G., Marto, R., & Melina, G. (2017). Investing in public infrastructure: Roads or schools? *IMF Working Paper*, 17 (105).
- Badalyan, G., Herzfeld, T., & Rajcaniova, M. (2014). Transport infrastructure and economic growth: Panel data approach for Armenia, Georgia and Turkey. *Review of Agricultural and Applied Economics*, 17(2), 22-31. <https://doi.org/10.15414/raae.2014.17.02.22-31>
- Bykova, A., Ghodsi, M., Grübler, J., Hanzl-Weiss, D., Holzner, M., Hunya, G., & Stehrer, R. (2018). Economic policy implications of the belt and road initiative for CESEE and Austria. *Policy Notes and Reports*, (23). <https://www.econstor.eu/handle/10419/204266>
- Fourie, J. (2006). Economic infrastructure: a review of definitions, theory and empirics. *South African Journal of Economics*, 74(3), 530-556. <https://doi.org/10.1111/j.1813-6982.2006.00086.x>
- Grieverson, R., & Holzner, M. (2018). Investment in the Western Balkans. *Policy Notes and Reports*, 27. <https://www.econstor.eu/bitstream/10419/204270/1/wiiv-pol-notes-27.pdf>
- Guild, R. L. (2000). Infrastructure investment and interregional development: Theory, evidence, and empications for planning. *Public Works Management & Policy*, 4(4), 274-285. <https://doi.org/10.1177/1087724X0044002>
- Gujarati, D. N., & Porter, D. C. (2020). *Basic Econometrics* (5th ed.). McGraw - Hill. https://cbpbu.ac.in/userfiles/file/2020/STUDY_MAT/ECO/1.pdf
- Gurara, D., Klyuev, V., Mwase, N., & Presbitero, A. F. (2018). Trends and challenges in infrastructure investment in developing countries. *International Development Policy*, 10.1. <https://doi.org/10.4000/poldev.2802>
- Holmgren, J., & Merkel, A. (2017). Much ado about nothing? - A meta-analysis of the relationship between infrastructure and economic growth. *Research in Transportation Economics*, 63, 13-26. <https://doi.org/10.1016/j.retrec.2017.05.001>
- Holzner, M., & Schwarzhappel, M. (2018). Infrastructure investment in the Western Balkans: a first analysis. *wiiv Research Report*, (432). <https://www.econstor.eu/handle/10419/204204>
- Javid, M. (2019). Public and private infrastructure investment and economic growth in Pakistan: An aggregate and disaggregate analysis. *Sustainability*, 11(12), 3359. <https://doi.org/10.3390/su11123359>
- Ke, X., Lin, J. Y., Fu, C., & Wang, Y. (2020). Transport infrastructure development and economic growth in China: Recent Evidence from Dynamic Panel System-GMM Analysis. *Sustainability*, 12(14), 5618. <https://doi.org/10.3390/su12145618>

- Kuzmina-Merlino, I., Skorobogatova, O., Schmidtke, N., & Behrendt, F. (2018). The financial and economic aspects of transport infrastructure development in Latvia. *Transport and Telecommunication Journal*, 19(3), 203-212. <https://doi.org/10.2478/ttj-2018-0017>
- Mahbobi, M., & Tiemann (2010) Regressions Basic. In *Introductory Business Statistics with Interactive Spreadsheets* (1st Canadian Edition). BCCampus.
- Mahroum, S. (2011). The pillars of growth. *Science Business*. <https://sciencebusiness.net/news/74641/The-pillars-of-growth->
- Miftari, F., & Ziberi, B. (2019). Public investments incentive factors of economic growth - case study of Republic of North Macedonia. *Knowledge International Journal*, 31(1), 187 - 192. <https://ikm.mk/ojs/index.php/KIJ/article/view/1033>
- Nyasha, S., & Odhiambo, N.M. (2019). The impact of public expenditure on economic growth: a review of international literature. *Folia Oeconomica Stetinensia*, 19(2), 81-101. <https://doi.org/10.2478/fofi-2019-0015>
- Palei, T. (2015). Assessing the impact of infrastructure on economic growth and global competitiveness. *Procedia Economics and Finance*, 23, 168-175. [https://doi.org/10.1016/S2212-5671\(15\)00322-6](https://doi.org/10.1016/S2212-5671(15)00322-6)
- Pritchett, L. (2000). The tyranny of concepts: CUDIE (cumulated, depreciated, investment effort) is not capital. *Journal of Economic Growth*, 5(4), 361-384.
- Snieska, V., & Simkunaite, I. (2009). Socio-economic impact of infrastructure investments. *Inzinerine Ekonomika-Engineering Economics*, 3(63), 16-25.
- Stock, J. H., & Watson, M. W. (2006). *Introduction to Econometrics* (2nd ed.). Pearson.
- Temjanovski, R., Dimitrova, J., & Gorgieva-Trajkovska, O. (2016). Investment in transport infrastructure as key determinant to boosting technological - industrial development zones in Republic of Macedonia. *Journal of Economics*, 1(2), 1-13.
- World Bank Group. (2019). *Western Balkan Regular Economic Report* No.15, Spring 2019: *Reform Momentum Needed*. World Bank. <https://doi.org/10.1596/31506>
- Yakubu, S., Adeyemi, A., Sule, A., & Ogunbajo, R. (2020). The relationship between road infrastructure budgetary expenditures and commercial property investment returns. Case study of Fadikpe area Minna, Nigeria. *Baltic Journal of Real Estate Economics and Construction Management*, 8(1), 187-196. <https://doi.org/10.2478/bjreecm-2020-0013>
- Zachariadis, I. A. (2018). Investment in infrastructure in the EU: Gaps, challenges, and opportunities. *Bruxelles European Parliamentary Research Service*. http://www.iberglobal.com/files/2018-2/infrastructure_eu.pdf
- Ziberi, B., & Avdiu, M. (2020). Econometric analysis to examine the relationship between unemployment and macroeconomics aggregates. Evidence from Kosovo. *Academic Journal of Economic Studies*, 6(2), 33-41. <https://zbw.eu/econis-archiv/bitstream/11159/4639/1/1728081610.pdf>

Received: November 15, 2020

Accepted: January 20, 2021