ANALYSIS OF SECTORAL PUBLIC EXPENDITURES GOVERNANCE AND THEIR IMPACT ON ECONOMIC GROWTH

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Abstract

Public expenditures are of great interest to all economic agents. Sectorial public expenditures are of great interest to policymakers. In this regard, the main aim of this study is to highlight the importance of public expenditures in the case of Kosovo and to measure the impact of sectorial public expenditures on economic growth. The data used are secondary and cover the period 2015–2022. The data are obtained from the Agency of Statistics in the case of Kosovo. The econometric model used in the process of the estimation of the impact of sectorial expenditures in economic growth is ordinary least square (OLS) and Pearson correlation. The results indicate that public expenditures on education positively impact the economic growth in the case of Kosovo followed by the general services. Other variables showed p-values greater than the condition alpha less than 0.05 and thus are not interpreted in the study. The impact of the different types of government spending on gross domestic product (GDP) varies (Alam et al., 2022). There have been intense discussions among academics over the rationale behind the ongoing rise in government spending over the past three decades, as there has been no corresponding improvement in any of the recognized metrics of progress (Onabote et al., 2023). The study comes with further recommendations in order the public sectorial expenditures to be more useful in line with the impact on economic growth.

Keywords: Sectorial Expenditures, Economic Growth, OLS, Pearson Correlation

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1. INTRODUCTION

Public spending is vital to a nation's economic development and is a key component in the formation of economic policy. These costs, which are distributed across many areas including infrastructure, social security, health, and education, aid in fostering the circumstances necessary for long-term, sustainable growth, and development. The management of public spending, which has an impact on the efficacy and efficiency of budgetary allocations, is crucial in this context. The significance of public spending as a means of promoting aggregate demand is emphasized by Keynesian theory. Infrastructure spending is believed to have a favorable effect on productivity development in emerging nations. These expenditures, which include building roads and bridges, help to improve the flow of commodities and services, which raises potential economic growth. On the other hand, the human capital theory contends that enhancing human potential requires spending on health and education. This hypothesis holds that a trained workforce fosters innovation and increases productivity. Public education investment raises credentials and skill levels, which

promotes long-term economic growth. Thus, a key element influencing the effectiveness of public expenditure is good governance. Establishing accountability and transparency procedures is crucial to increasing public confidence in public institutions. Public expenditure is frequently rendered ineffective by corruption and bad administration, which results in inefficient use of resources.

Public expenditures play a very important role in economic growth. Public expenditures represent the third component of the equation for calculating the gross domestic product (GDP) in terms of expenditure, according to which the GDP equation is equal to the sum of consumption, investments, government expenditures, and the difference between export and import. Government expenditures represent the different types of public expenditures which are categorized according to the leading governments of the states. Public expenditures according to their specific type and weight orient the economy of a country towards growth if they are addressed with productive and long-term goals. The amount of money allocated by the government to state necessities, including health, education, pensions, reducing poverty, improving citizen well-being, capital investments, economic development, etc., is planned.

The national budget is the main instrument through which governments collect resources from the economy, in a sufficient and appropriate manner; and allocate and use those resources responsively, efficiently and effectively. One of the two primary sets of macroeconomic instruments available to governments to promote growth, strengthen macroeconomic stability, and create sustainable social results is fiscal policy measures, which include targeted government spending and taxes (Đurović-Todorović & Đorđević, 2009). Although there is a lack of consistency in the methods used in domestic literature to calculate public expenditures, it is evident that state needs — which arise from the latter — are what ultimately decide public expenditures (Mykhaylyak, 2022). Public spending is necessary for state operations and should be ideally balanced between benefits and tax sacrifices. The amount and increase of public spending should be guided by a number of ideas by Trotman-Dickenson (1983). Taking note of the fact that previous research has concentrated on the relationship between growth and the amount of public spending, another study determines the circumstances in which altering the structure of spending results in an increase in the economy's steady-state growth rate. The prerequisites rely not only on the original shares but also on the physical productivity generated by the various public spending components (Devarajan et al., 1996).

Public spending has an impact on the country's social structure and economy through the processes of redistribution, allocation, and stimulation. Allocation serves the purpose of giving the populace access to commodities and services that the market economy is unable to provide in large enough quantities. The core of the redistribution role is the use of public funds to solve other issues, promote regional development in areas, and reduce economic disparity among society's members. Through various techniques of their execution, the public expenditure function of stimulation seeks to change the quantities, components, or structure of public expenditures to stimulate specific directions of economic activity (Malyniak, 2021).

By delivering necessary services, stimulating the economy, and fostering social mobility, public spending policies may encourage inclusive growth and lower income disparity (Zouhar et al., 2021). Economic development is strongly correlated with productive public spending; the ideal ratio varies inversely with degrees of environmental pollution, and the steady-state equilibrium is a saddle point (Barman & Gupta, 2010). A study by Atems (2019) finds that spending on public health has a favorable correlation with growth, even when taxes and government budgetary limits are taken into consideration. Public expenditures represent a significant and increasing portion of total economic activity in all highly industrialized nations (Burkhead & Miner, 2007).

The government plans how much of its income will be spent on the needs of the state, such as education, health, pensions, alleviating poverty, increasing the well-being of citizens, capital investments, economic development, etc. Fiscal policy measures, including targeted government spending and taxation, are one of the two main sets of macroeconomic tools at the disposal of governments to enhance growth, improve macroeconomic stability, and shape sustainable social outcomes (Garry & Rivas Valdivia, 2017). According to the Keynesian theory, economic growth in a country arises as a result of an increase in public sector expenditure thus government expenditure is acted as an independent variable and could be used as an influential policy variable to affect economic growth (Rahman et al., 2023). Sustained and equitable economic growth is a predominant objective of public expenditure policy thus the public programs are specifically aimed at promoting sustained and equitable economic growth. In this direction, it is well-known that appropriate public expenditures can also be effective in boosting economic growth, even in the short run, when limits to infrastructure or skilled manpower become an effective constraint to an increase in production (International Monetary Fund [IMF], n.d.).

Public expenditures as a percentage of GDP are forecasted by the World Bank Group (2023) thus in the case of Kosovo in 2020 there were projected 33%, followed by 28.8% in 2021, 29.2% in 2022, 30.1% in 2023, 30.1% in 2024, and 30.1% in 2025 of which wages are greater than the social benefits and capital expenditures. The World Bank Group (2023) also noted that the Government of Kosovo was able to successfully weather the COVID-19 crisis and mitigate the impact of the ongoing inflationary crisis caused by the Russian invasion of Ukraine thanks to its healthy fiscal accounts and stable financial sectors but also added that in the same time, however, the overlapping external shocks have highlighted the inherent volatility that mirrors Kosovo's structural limitations — especially in health, energy, and education — and accentuates gaps in both human and physical capital (World Bank Group, 2023).

Regarding the Public Expenditure and Financial Accountability (PEFA) report, the planning and performance of the budget in the case of Kosovo is generally done well, the exception being the deviation in both administrative and economic classification due to under-implementation in 2018 and the COVID-19 pandemic in 2020, thus even

though the budget process is clear and with set rules and deadlines in place, nonetheless, better planning of capital expenditure spending would result in more efficient use of resources and more accurate budget projections. On the other hand, inaccurate budget projections may lead to fiscal risks stemming from underspending of capital expenditures. Since capital expenditure plays a major part in public investment and revenue estimates, they might have an impact on overall macroeconomic and fiscal projections. There are little variations in the revenue output. The Government of Kosovo forecasts a rate of underperformance for capital expenditure while developing its macro-fiscal analysis, however, risks still exist (PEFA, 2022).

Taking note of the literature's emphasis on the relationship between growth and the amount of public spending, we determine the circumstances in which altering the structure of expenditure raises the economy's steady-state growth rate. The main aim of this study is to analyze the sector public expenditure's structure and to measure their impact on economic growth in the case of Kosovo. Based on the importance of the study especially in the case of Kosovo, the study goes further with the analysis. The main objectives of the study are to elaborate on the trends of the sector's public expenditures in the case of Kosovo and to measure specifically the impact of the education, health and security expenditures on the economic growth in the case of Kosovo. There is a lot of argument trying to explain the way sector public expenditures may impact economic growth thus the study tries to answer the research questions such as:

RQ1: What are the trends of the sector's public expenditures during the period under investigation?

RQ2: Which category of sectoral expenditures has the greatest budgetary weight in the case of Kosovo's economy?

The research gap indicates that there are no previous studies that examine the sectorial expenditures in the case of Kosovo and specifically measure their impact on economic growth. Furthermore, the study gap indicates an absence of comparative context, inadequate long-term analysis, and inadequate investigation of effect mechanisms are some of the research shortcomings. On the other hand, external factors like as trade regulations, international aid, or world economic trends may have been overlooked. Prior research may have limited the practical value for policymakers in Kosovo if it did not offer specific, implementable policy suggestions based on its results. It is possible that external factors that might influence the link between governmental spending and economic development in Kosovo — such as trade policy, international aid, or global economic trends — have been overlooked.

The sectorial expenditures are of great interest to researchers, scholars, and policymakers as the direction and trend of the sectorial expenditures have their own budget space within a country and thus may positively impact economic growth if they are correctly allocated.

The study is structured as follows. Section 1 presents the scope of the study including the research aims, research objective, and research questions. Section 2 reviews the literature. Section 3 provides the research methodology and data collection. Section 4 presents the result. Section 5 concludes the paper.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The complex link between sectoral public expenditure governance and economic development has been extensively studied in recent literature.

A number of theories examine how government spending affects aggregate demand, public choice, human capital, infrastructure investment, and growth. These include the Keynesian economic model, public choice theory, human capital theory, and Solow growth models. Increased public spending may boost economic activity, especially during recessions, according to Keynesian economics. The impacts of interest groups and lobbying, as well as how political processes affect public expenditure allocations, are all examined under public choice theory. Investments in health and education are thought to increase worker productivity and efficiency, according to human capital theory, whereas infrastructure investment models evaluate how public investments affect economic growth.

To present an updated knowledge of how governance affects public expenditure effectiveness and its consequences for economic growth, this study synthesizes data from recent studies. The findings of an empirical study on the connections among economic growth, government efficacy, and public social expenditure are presented by Cooray and Nam (2024). The study concludes that governments must actively create and carry out social expenditure programs in order to promote inclusive growth. However, they should be supported by concurrent initiatives to improve the caliber of public institutions, as this has a significant effect on the link between social expenditure and growth. On the other hand, Devarajan et al. (1996) find that there is a negative correlation between per capita growth and the capital component of governmental spending. Therefore, over usage of expenses that appear to be beneficial might have the opposite effect. These findings suggest that governments in developing nations have been misallocating public funds to prioritize capital projects above ongoing spending. According to Zeynalli and Hasanoğlu (2022), spending on health and research has a negative effect on economic growth and is inversely correlated with it, whereas spending on education, the economy, and society has a favorable effect. In general, the data indicates that the link between public spending and economic development can be either positive or negative, depending on how successful the spending is. This study contributes to the increasing amount of data showing that government expenditure is linked to and significantly affects economic development. Furthermore, the study comes to the conclusion that the elements of government expenditure that were looked at are significant factors in determining how Azerbaijan's economy has grown.

Research on public spending in transitional economies emphasizes how crucial trend analysis is to comprehend the efficacy of fiscal policy. Recent evaluations (World Bank Group, n.d.) for Kosovo demonstrate that changes in public expenditure have been attributed to both economic situations and governance frameworks. The patterns show how budgetary allotments have changed over time, reflecting the demands of the economy and governmental goals. World Health Organization

(WHO, 2021) shows that to enhance public health outcomes and service accessibility, health spending has usually grown. Investing in education is essential to the development of human capital. Research indicates that to bridge the skill gaps in the job market, Kosovo has emphasized expenditure on education (Rraci & Pupovci, 2020).

The existing literature review regarding sector expenditures gives information that the sector expenditures impact economic development and economic growth. Pasynkov and Zakharchuk (2020), in their study, noted that the Russian Federation's regions' socio-economic growth is greatly impacted by the general government sector's spending, albeit the extent of this influence varies according to the sector's existence within the area. Another study by Devarajan et al. (1996) emphasizes that while there is a negative correlation between capital spending and per-capita growth, increasing the amount of current expenditure in public expenditure has a favorable effect on economic growth. Also, the study concludes that governments in developing nations have been misallocating public funds such that capital expenditures are prioritized above current expenses. Based on Pradhan's (1997) findings, it is important to examine budgetary institutions to make sure that the underlying incentive structure supports overall fiscal restraint, equitable and allocative expenditure composition, and technical efficiency in the utilization of budgeted resources.

Onifade et al. (2019) examine the impact of public expenditures on Nigerian economic growth using Pesaran's autoregressive distributed lag (ARDL) approach. The study results show a relationship between public spending indicators and economic growth. The study also concludes that recurrent government expenditures negatively impact growth, while positive public capital expenditures have no significant impact. The study also shows that fiscal expansion based on debt financing significantly influences public expenditures and domestic investment.

Lupu et al. (2018) examine the impact of public expenditure categories on GDP growth in Central and Eastern European countries using an ARDL model. Results show that education and healthcare expenditures positively impact the economy, while defense, economic affairs, public services, and social welfare negatively impact it.

Rahman et al. (2023) measure the importance of government expenditures to estimate their impact on economic growth. In their study, the authors applied the ordinary least squares (OLS) regression, co-integration, and Granger causality in the perspective of panel data from the South Asian Association for Regional Cooperation (SAARC) countries including Bangladesh, India, Pakistan, Sri Lanka, and Bhutan from 2011 to 2020. The study concluded that government spending has a strong positive impact on GDP in SAARC countries, according to the empirical data and random effect estimation. Also, the study highlights that, in SAARC countries, government expenditure and economic growth have a long-lasting relationship and highlights the unidirectional causality between GDP and government expenditure in the region.

Mose (2021) estimates the impact of the government sectoral expenditure on economic growth in East African countries over the period from 1985 to 2015 with special emphasis on the sectoral expenditures on health, education, defense, and agriculture segments. The study used secondary data obtained from statistical abstracts and World Bank reports using the OLS technique and fixed effect to measure the relationship between the variables. It concludes that agriculture and education expenditures have an insignificant impact on economic growth and productivity and finds also a significant positive impact on economic growth of expenditure on health and defense.

Emeru (2023) used the time series data for the period 1980 and 2018 to measure the impact of the sectorial expenditures on economic growth in the case of Ethiopia. The study used the Johansen cointegration test and the vector error correction model (VECM) to measure the short- and long-term correlations between public spending and economic growth in case of the Ethiopia. The study highlights that both long- and short-term economic growths are positively and significantly impacted by government spending on education. The study also finds out that in the long-term economic growth is negatively impacted by government expenditure on agriculture, and in the long run, investment spending has a positive but negligible impact on economic growth; however, in the short run, it has a negative but large effect. Also, regarding the defense spending by the government, the study concludes that defense expenditures have a positive and negligible effect on economic growth over the short and long terms. The study concludes that government spending on the education sector would help to foster the conditions that could result in higher labor force participation rates and, consequently, higher rates of economic growth.

Duruibe et al. (2020) measure the effect of government public expenditures on Nigeria's economic growth and development using the sectorial economic function approach. The study used the real GDP as the dependent variable and the government's expenditures on administrative services, economic services, social and community services, and transfers were used as the independent variables. The study used the cointegration test and VECM. The study concludes the independent variables used, apart from expenditure on administration, have a positive relationship with economic growth. The result obtained from the Wald coefficient diagnostic test reveals that there is short-run causality running from the public expenditure aggregates to economic growth.

Ifarajimi and Ola (2017) analyze the impact of government expenditure on economic growth from 1981 to 2015 using dynamic OLS and the unit root test using augmented Dickey-Fuller. The study finds that the two-step Engle-Granger residual test showed that the residual was stationary at level; thus, there was a long-run relationship among the series. The study concludes from the dynamic OLS that the government expenditure on administration, government expenditure on economic services, and nominal exchange rate were significant and had the expected signs except for government expenditure on economic services.

The causation between government expenditures and economic growth was analyzed by Jiranyakul (2013) for the case of Thailand using the Granger causality test. The study finds that there is no cointegration between government expenditures and economic growth and also highlights that unidirectional causality from government

expenditures to economic growth exists. The study concludes from the least square method with lagged variables of economic growth, that the government expenditures and money supply show the strong positive impact of government spending on economic growth during the period of investigation.

Yovo (2017) investigates the impact of the level and the composition of public expenditures on growth and also the link between public investment and private investment in the case of Togo. The study follows the neoclassical growth model and a private investment model using two-stage least squares. The study finds that during the time under investigation 1980–2013, the composition of public expenditures had a significant effect on economic growth thus, public consumption had a negative impact whereas public investment had a positive impact on growth.

The body of research on the relationship between sector-specific public spending and economic development has both advantages and disadvantages. Using a variety of approaches and large data sets, several studies provide a thorough examination of public spending and its impact on economic development (Barro, 1990; Gupta et al., 2005). Sophisticated econometric methods are frequently used, offering strong insights into broad trends. Nonetheless, a typical drawback is the absence of a thorough sector-specific study. Research often combines data on public spending without taking into account the unique effects of expenditures on areas like infrastructure, health, and education (Baldacci et al., 2004). Furthermore, a large portion of research is concentrated on industrialized economies, which restricts the relevance of results to transitional and developing countries such as Kosovo. The robustness of the results is attributed to the methodological techniques used in the literature, which involve complex statistical models and thorough data analysis (Mankiw et al., 1992). Nonetheless, a dearth of research exists about the long-term consequences of public spending on economic development as most of the studies concentrate on the immediate effects. Moreover, problems with data availability and quality, particularly in developing nations like Kosovo, might impact the accuracy of the findings (Sachs et al., 1995). Additionally, models frequently employ broad frameworks that cannot take into consideration the unique economic circumstances of emerging or smaller nations. Policy implications derived from existing research often provide valuable recommendations for improving public expenditure efficiency (World Bank Group, 2016). Nevertheless, these recommendations can be overly generalized and may not fully address the unique contexts of different countries, such as Kosovo. The literature sometimes overlooks the role of external factors like international aid and global economic conditions, which can significantly influence the effectiveness of public spending (Feldstein & Horioka, 1980). Addressing these gaps can enhance the relevance and applicability of research findings for policymakers in Kosovo and similar contexts.

The hypotheses raised in this study are as follows:

H1: The public expenditures on education positively impact the economic growth in the case of Kosovo.

H2: The sectorial expenditures on health have an impact on economic growth.

H3: Public order and safety have an impact on economic growth.

H4: Public expenditures on defense have an impact on economic growth.

H5: Public expenditures on general services have an impact on economic growth.

3. RESEARCH METHODOLOGY AND DATA ANALYSIS

The sectorial expenditures are of great interest to policymakers as they impact economic growth. Following the hypotheses, this research study attends a literature review related to the field of sectorial expenditures both theoretically and empirically. In this regard, in the part of the theories, there are cited definitions, the mean and importance of the sectorial expenditures within an economy, and the empirical research brings in the analysis of the topic from different authors and follows up with the hypothesis building in this study.

The data used are secondary and are obtained from the Agency of Statistics in Kosovo. The data cover the period 2015–2022 and include the trends of sectorial expenditures in the case of Kosovo. The time period is chosen due to the availability of the data. Errors or inconsistencies that were not visible at the time of data collection may exist in secondary data. These may result from inaccurate reporting, measurement errors, or data input (Cohen et al., 2007).

If the initial data gathering was not meticulous, the quality of the data may be jeopardized. There is a chance that the secondary data will not exactly match the goals or questions of the study. The information may not be current, or it may not cover the relevant factors or population.

On the other hand, the information gathered throughout various periods or in different settings may not be relevant to the current investigation, which might result in misunderstandings.

Because the study covers only the period 2015–2022, there is a lack of historical data that can help fully understand the impacts of government policies on public spending and economic development in a broader context. It is also worth noting the limitations of short periods when working with secondary data, in the absence of data for longer historical periods, the short period may lead to inaccuracy in the conclusions drawn, as the results may not fully represent the full impact of public expenditure governance on economic growth, leaving out important factors that may have occurred in the past.

Based on the categories, specifically the sectorial expenditures in the case of Kosovo are as follows:

- General services
- Defense
- Public order and safety
- Economic affairs
- Environmental protection
- Housing and community amenities
- Health
- Recreation, culture and religion
- Education
- Social protection
- Grand total

The above categories of sectorial expenditures are presented using figures and also the data are used in econometric analysis.

The econometric model used for data estimation in this study is chosen as the OLS regression. The interpretation of the connection between variables and errors and data analysis can be greatly impacted by the misspecification of OLS linear regression (Kuchibhotla et al., 2018). Further, in regression models with a shared subset of explanatory variables, the best linear-unbiased estimators are the OLS estimators (Balestra, 1970). OLS is a statistical method for estimating unknown parameters in linear regression models by minimizing the sum of squared vertical distances between actual and predicted responses (Hoffmann, 2016). A well-liked technique for estimating parameters in linear regression models with measurement errors in independent variables is the OLS estimator (Gleser et al. 1987).

OLS is presented with the following equation:

$$\gamma = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_n X_n + \mu \qquad (1)$$

where γ represents the dependent variable of the model, in our case of *GDP analysis*, β_0 represents the constant, β_1 (2, 3, n) are the parameters and μ represents the error term. While X_1 (2, 3, n) represents the number of independent variables of the model.

In this study, the dependent variable in the OLS model is set as the *GDP* and the independent variables are as follows: *General services*; *Defense*; *Public order and safety*; *Economic affairs*; *Environmental protection*; *Housing and community amenities*; *Health*; *Recreation, culture and religion*; *Education*; *Social protection*; *Grand total*.

In general, when we work with yearly data using one country into analysis the basic econometric model used is OLS. But before the OLS is used there is also used the Pearson correlation matrix to show the relationship between variables.

The importance of the OLS model is estimated based on the coefficient of determination according to the equation:

$$R^2 = \frac{RSS}{TSS} \; or \; R^2 = 1 - \frac{ESS}{TSS} \qquad (2)$$

The importance of the independent variables included in the analysis is estimated using the p-value of the coefficients and beta estimators which is discussed further in the section of the findings.

The alternative methods that can be used if it were possible to gather monthly data are the vector autoregression model (VAR) and autoregressive integrated moving average (ARIMA).

X-12-ARIMA and other econometric models might be used if monthly data were available. This methodology works especially well for time series data analysis and seasonal correction. Furthermore, since the exponential smoothing state space (ETS) model accurately depicts trends and seasonal patterns, it would be appropriate for projecting monthly data.

The study's examination of sectoral public expenditures was conducted between 2015 and 2022 since this time frame was deemed relevant for capturing noteworthy political and economic events in the area. Important things happened during this time, such as the COVID-19 pandemic's effects and attempts to recover economically from the global financial crisis, which had a big impact on public expenditure trends and the Western Balkans' ability to expand economically. Although we admit that the Agency of Statistics in Kosovo has some missing data, it is crucial to remember that no data is accessible before 2015.

We chose the period of 2015–2022 because it enables a thorough analysis of patterns and variations in public spending. The significance of any gaps is lessened because consistent data was available for the majority of these years. Moreover, the chosen time frame offers a pertinent backdrop for comprehending the relationship between sector-specific public spending and economic development.

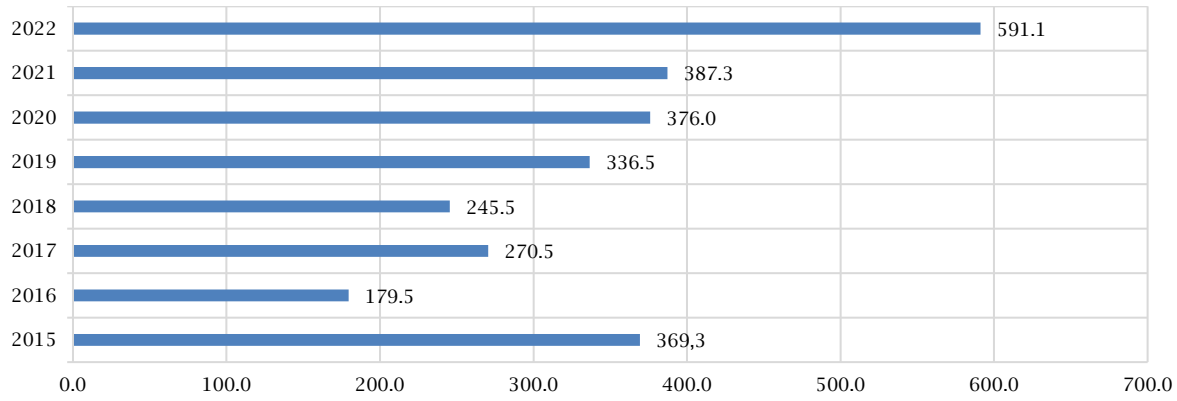
4. RESULTS

4.1. Statistical findings

The statistical findings obtained from the sectorial expenditures in the case of Kosovo for 2015–2022 are presented below.

Figure 1 presents the sectorial expenditures for general services for 2015–2022. As we can see, in 2015, the general services expenditures were 369.3 whereas in 2016, there was a decrease of 179.5 even though from 2017 to 2022 the trend increased and 2022 reached 591.1.

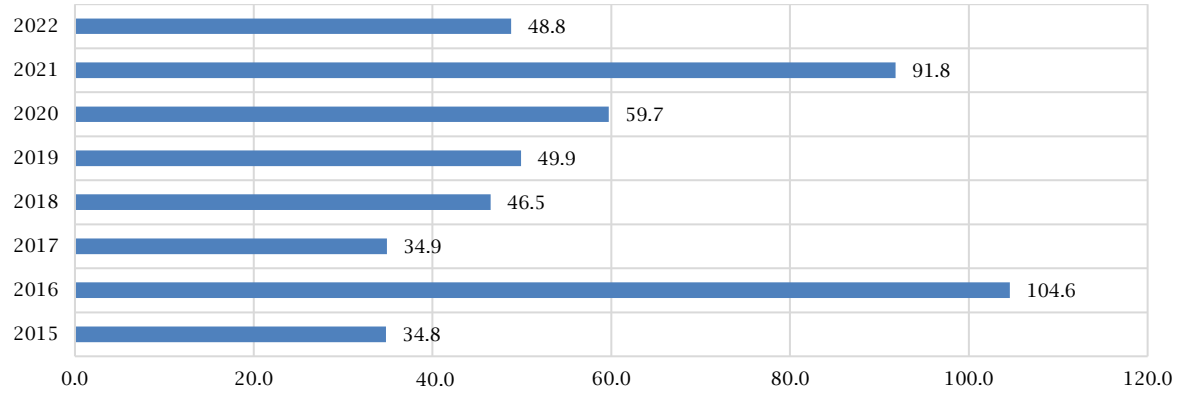
Figure 1. General services



Source: Author's elaboration based on the Kosovo Agency of Statistics (https://askdata.rks-gov.net/).

Figure 2 presents the sectorial expenditures regarding defense for 2015–2022. In 2015, the sectorial expenditures for defense were 34.8 and in 2016, they reached 104.6. There was a drop in 2017 at point 24.9 but from 2018 to 2021 the trend is positive and the defense expenditures reached 91.8 in 2021. There is also a decrease as in 2022, the defense expenditures decreased to 48.8.

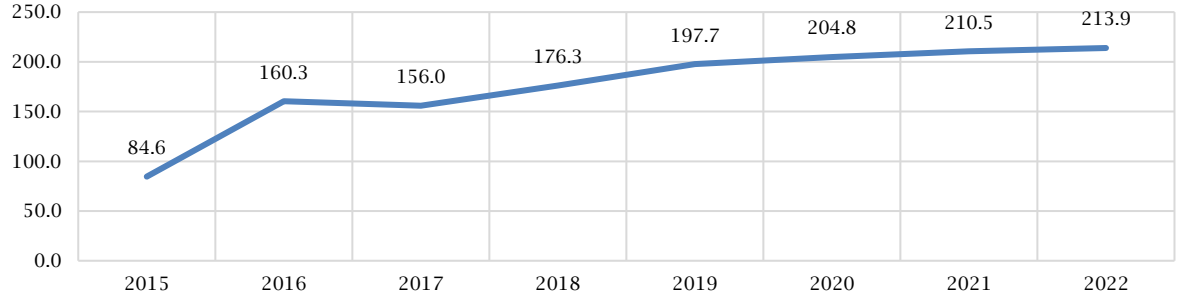
Figure 2. Defense



Source: Author's elaboration based on the Kosovo Agency of Statistics (https://askdata.rks-gov.net/).

Figure 3 presents the data regarding the sectorial expenditures for public order and safety for 2015–2022. In 2015, the public order and safety expenditures were 84.6. In 2016, they increased to 160.3. Figure 3 shows an increasing trend, and in 2022, the public order and safety expenditures increased to 213.9.

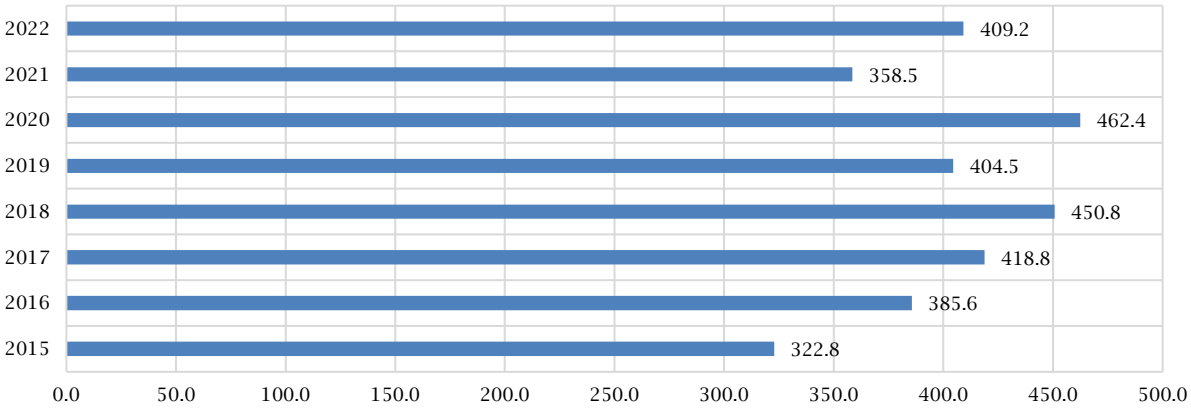
Figure 3. Public order and safety



Source: Author's elaboration based on the Kosovo Agency of Statistics (https://askdata.rks-gov.net/).

Figure 4 presents the data regarding the sectorial economic affairs covering the period 2015–2022. In 2015, the economic affairs expenditures were 322.8. In 2016, they increased to 385.6 followed by an increasing trend in 2017 and reached the point 418.8. In 2018, the level of economic affairs expenditures reached at the point 450.8. In 2019, there was a decrease when the economic affairs expenditures decreased to 404.5 to increase again in 2020 at the point 462.4 but in the year 2021, there was a decreasing trend at point 358.5 followed by an increase in 2022 at 409.2.

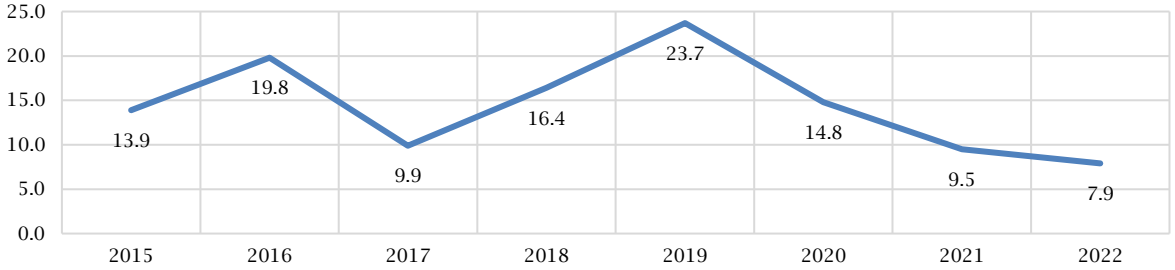
Figure 4. Economic affairs



Source: Author's elaboration based on the Kosovo Agency of Statistics (https://askdata.rks-gov.net/).

Figure 5 presents the trend regarding the environmental protection expenditures for 2015–2022. There was a fluctuating trend thus in 2015, the environmental expenditures were 13.9 to follow an increase trend in 2016 at 19.8. There was a decrease of 9.9 in 2017. From 2017 to 2019, the trend increased exactly in 2019 reaching 23.7 but in 2020 decreased to 14.8 and followed a decreasing trend in 2021 at 9.5 and in 2022 at 7.9.

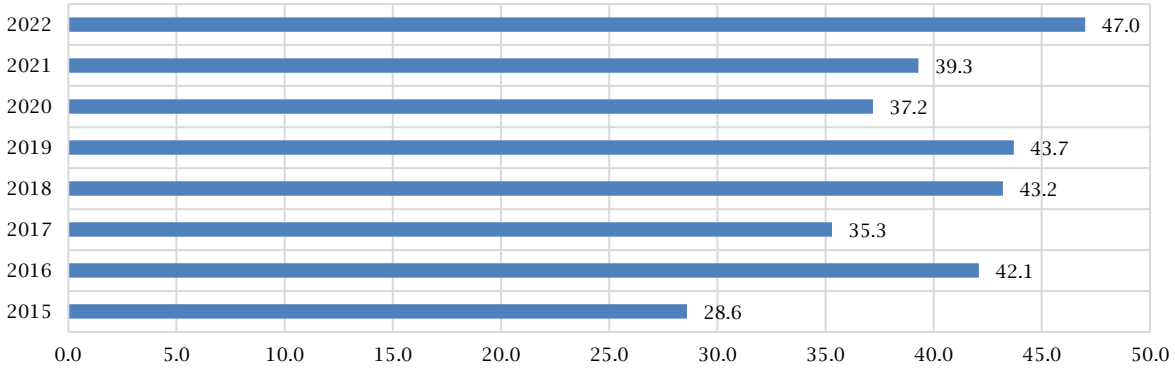
Figure 5. Environmental protection



Source: Author's elaboration based on the Kosovo Agency of Statistics (https://askdata.rks-gov.net/).

Figure 6 presents the trend of the housing and community amenities expenditures covering the period 2015–2022. In 2015, the expenditures were 28.6, and in 2016, they reached 42.1 followed by a decrease in 2017 at 35.3 but in general, the trend increased, and in 2022, reached 47.0.

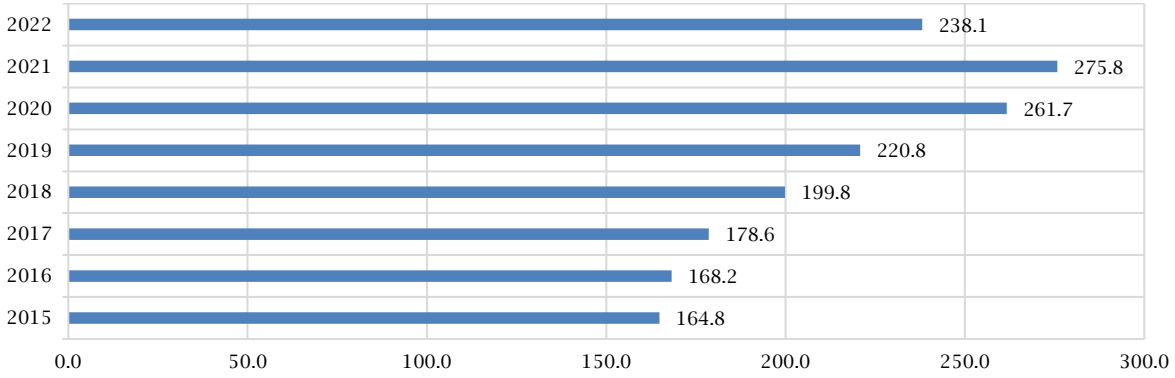
Figure 6. Housing and community amenities



Source: Author's elaboration based on the Kosovo Agency of Statistics (https://askdata.rks-gov.net/).

Figure 7 presents the data regarding the sectorial expenditures on health for 2015–2022. In 2015, the health expenditures were 164.8 and increased over the years. In 2016, the health expenditures were 261.7 followed with increasing in 2021 at 275.8 thus, 2021 was the year when the health expenditures reached the highest point for time period analyzed. In 2022, the trend decreased at 238.1.

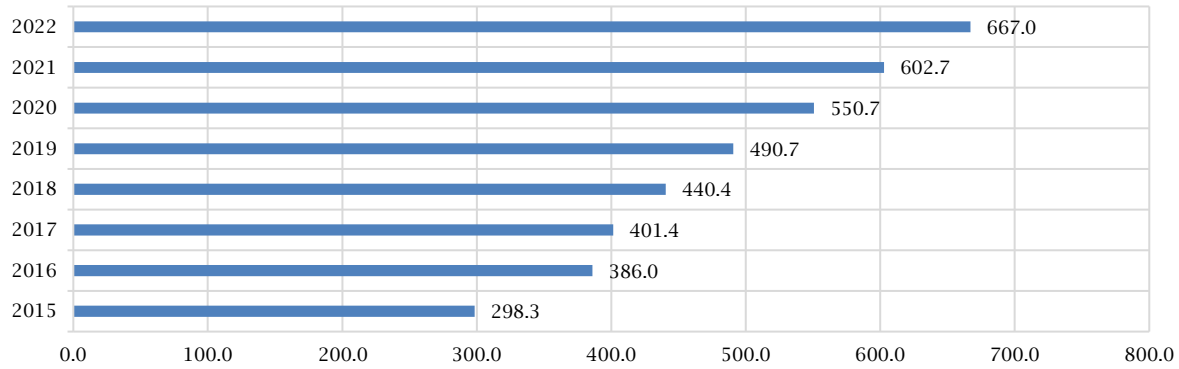
Figure 7. Health



Source: Author's elaboration based on the Kosovo Agency of Statistics (https://askdata.rks-gov.net/).

Figure 8 presents the data regarding the social protection expenditures for 2015–2022. In 2015, the social protection expenditures were 298.3 and increased over the years. In 2016, the social protection expenditures reached 386 followed by an increasing trend. In 2021, they reached 602.7, and in 2022, they reached 667.

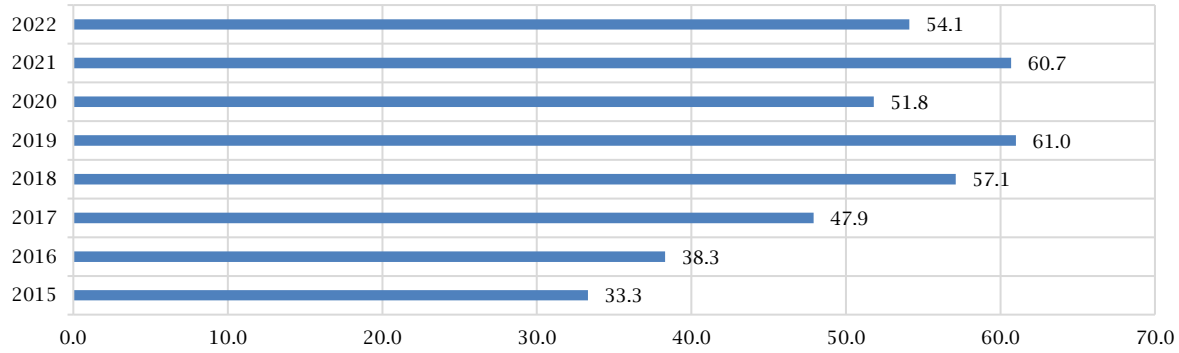
Figure 8. Social protection



Source: Author's elaboration based on the Kosovo Agency of Statistics (https://askdata.rks-gov.net/).

Figure 9 presents the data about sectorial expenditures of recreation, culture and religion for 2015–2022. In 2015, the sectorial expenditures of recreation, culture and religion were 33.3 and increased by years. In 2016, they reached 38.3 followed by an increasing trend. In 2019, they reached 31 but in 2020, the trend decreased to 51.8. followed by an increase in 2021 at 60.7 and in 2022, it also showed a decrease at 54.1.

Figure 9. Recreation, culture and religion

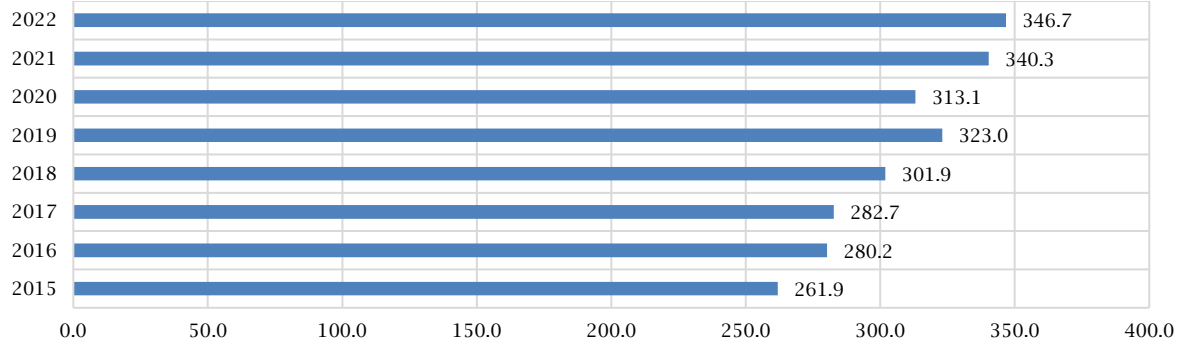


Source: Author's elaboration based on the Kosovo Agency of Statistics (https://askdata.rks-gov.net/).

Figure 10 presents the expenditure on education in Kosovo from 2015 to 2022, showing investment trends in this essential sector.

Expenditures for education have had a continuous increase, starting from 261.9 million euros in 2015 and reaching 323.0 million euros in 2019. This increase shows a commitment to increasing investments in education and improving the quality of educational services. In 2020, spending on education dropped slightly to 313.1 million euros. This decline may be related to economic factors and other challenges affecting public budgets: Expenditure on education returns to growth, reaching 340.3 million euros in 2021 and 346.7 million euros in 2022. This increase suggests a return of commitment to support education and its development. Increasing spending on education is essential for the economic and social development of the country. Investing in education helps to form a more qualified workforce capable of meeting the demands of the market. The drop in spending in 2020 shows that external situations can have significant impacts on public budgets.

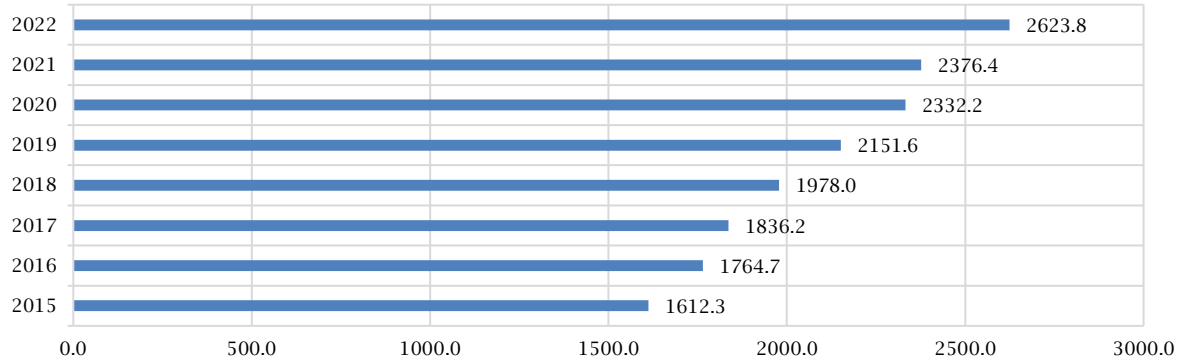
Figure 10. Education



Source: Author's elaboration based on the Kosovo Agency of Statistics (https://askdata.rks-gov.net/).

Figure 11 presents the data about the grand total for 2015–2022. In 2015, the sectorial expenditures were 1612.3 and increased over the years. In 2016, they reached 1764.7 followed by an increasing trend. In 2022, they reached 2623.8 points.

Figure 11. Grand total



Source: Author's elaboration based on the Kosovo Agency of Statistics (https://askdata.rks-gov.net/).

4.2. Empirical findings

Table 1 and Table 2 present the empirical findings obtained from the Pearson correlation matrix and linear regression analysis.

The Pearson correlation matrix (Table 1) presents the level of the relationship between two variables. The point references of the Pearson correlation are from negative to positive but the greater the coefficient and toward point one the greater the relationship between variables and one means the perfect relationship. In this regard, we can follow with the description of the relationship between variables as we can see the variable *General services* is in a strong relationship with the *GDP* at point 0.7656. The variable *Defense* is in a positive but weak relationship with the *GDP* at the point 0.0663 and is in a negative relationship with the variable *General services* at the coefficient -0.2742.

Table 1. Pearson correlation

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
1. GDP	1.0000											
2. Generalser~s	0.7656	1.0000										
3. Defense	0.0663	-0.2742	1.0000									
4. Publicorde~y	0.8130	0.3588	0.3273	1.0000								
5. Economicaf~s	0.2151	-0.0889	-0.1597	0.5595	1.0000							
6. Environmen~n	-0.4254	-0.5627	0.1662	-0.0919	0.1070	1.0000						
7. Housingand~s	0.6921	0.1952	0.2996	0.7688	0.4628	0.1636	1.0000					
8. Health	0.7364	0.5540	0.2450	0.8186	0.2730	-0.2894	0.3471	1.0000				
9. Recreation~n	0.7150	0.2737	0.0236	0.8406	0.4667	-0.0197	0.6220	0.7436	1.0000			
10. Education	0.9534	0.6488	0.1956	0.9057	0.2681	-0.2555	0.6944	0.8683	0.8358	1.0000		
11. Socialprot~n	0.9502	0.7020	0.2067	0.9032	0.3298	-0.3937	0.6395	0.8810	0.7286	0.9675	1.0000	
12. Grand total	0.9420	0.7435	0.1245	0.8849	0.3550	-0.3643	0.6151	0.8860	0.7263	0.9611	0.9928	1.0000

Source: Authors' elaboration.

The variable *Public order and safety* is in a strong relationship with the *GDP* at the coefficient value of 0.8130. This variable shows a positive but weak relationship with the variable *Defense* and *general services*. The variable *Economic affairs* is in a weak relationship with the *GDP* at the coefficient of 0.2151 and is in a negative relationship with the variables *Public order and safety* and *Defense* and in a good relationship with the variable *General services*.

The variable *Environmental protection* has a negative relationship with the *GDP* and with the variable *Economic affairs* and *Defense* and a weak relationship with the variable general services. The other variables included in Pearson correlation such as *Housing*, *Health*, *Recreation*, *Education*, and *Grand total* are in a strong relationship with the variable *GDP*.

After the results obtained from the Pearson correlation matrix, the study presents also the OLS regression analysis results in Table 2.

The dependent variable included in the analysis is the *GDP* and the independent variables included in the analysis are *Public order and safety*, *Education*, *Health*, *Defense*, and *General services*. From the results, we can refer to the p-value to measure the significance of the variables. In this direction firstly we can say that regarding the R coefficient that measures the goodness of the fit for the model at the coefficient 0.9993, we can say that the model fit.

The significant variables included in the model are *Education* and *General services* with p-values less than 0.05 thus the alpha condition is met. The other variables such as *Public order and safety*, *Health*, and *Defense* are not significant in the model circumstances.

Table 2. Linear OLS regression

Source of variation	*SS*	*df*	*MS*	*Number of observations = 8*		
Model	3.7066e+14	5	7.4132e+13	F (5, 3) = 2208.90		
Residual	1.0068e+11	3	3.3561e+10	Prob > F = 0.0000		
Total:	3.7076e+14	8	4.6345e+13	R-squared = 0.9997		
				Adj. R-squared = 0.9993		
				Root MSE = 1.8e+05		
GDP (dependent variable)	***Coefficient***	***Std. Err.***	***t***	***P > |t|***	***[95% conf. interval]***	
Public order and safety	6600.436	3014.396	2.19	0.116	-2992.718	16193.59
Education	20393.48	2048.781	9.95	0.002	13873.34	26913.61
Health	-7764.002	3370.494	-2.30	0.105	-18490.42	2962.414
Defense	703.3955	3274.139	0.21	0.844	-9716.376	11123.17
General services	2824.367	826.275	3.42	0.042	194.7912	5453.943

Note: SS — Sum of squares, MS — Means of squares, df — Degrees of freedom.
Source: Authors' elaboration.

Also, regarding the pretest analysis, the other types of sectorial expenditures are excluded from the model as they show no significance. It is important to mention that the non-significance of the variables may be a cause of several factors. According to Harris and Sollis (2003), a number of time series analysis approaches stress the value of precise forecasting methods in econometrics. Also, Wooldridge (2016) offers a thorough overview of econometric methodologies, emphasizing the useful uses of statistical tools in economic analysis.

Gujarati and Porter (2009) emphasize the practical applications of these approaches to real-world data. Stock and Watson (2019) include updated examples that show how to apply theoretical ideas.

According to the notion of human capital, increasing education improves labor productivity and skills, which spurs economic growth. A population with greater education is better able to innovate, adapt to new technologies, and boost overall productivity, all of which have a favorable effect on GDP. The Keynesian viewpoint emphasizes that government expenditure has the power to boost the economy, particularly in recessions.

Through the creation of employment and a rise in disposable income, investments in public services and education may raise aggregate demand and support economic growth.

In line with our findings, there is also evidence from other research studies about the importance of public spending on education on economic growth. Barro (2001) highlights the importance of human capital in economic development. The quality of higher education is a crucial factor for GDP growth, with educational skills playing a vital role in achieving this growth (Goczek et al., 2021).

4.3. Hypothesis testing

Based on the OLS regression results, we accept *H1* and conclude that in our case of analysis, the public expenditures on education positively impact the economic growth in the case of Kosovo and also, we accept *H5* and conclude that public expenditures on general services have an impact on economic growth. We refuse the other hypotheses (*H2*, *H3*, and *H4*) because in our circumstances they indicate no significance.

5. CONCLUSION

The public expenditures are of great importance toward economic growth and sustainability. Every governance despite its ability to collect revenues is oriented to productive expenditures to positively impact economic growth. Thus, in the case of Kosovo, there is work to do for public expenditures to impact economic growth. In the study circumstances the public expenditures on education positively impact the Kosovo economy followed by public expenditures on general services.

The other kinds of expenditures included in the analysis do not have significance in the study circumstances thus we cannot interpret their results obtained from the econometric OLS model. From the Pearson correlation matrix, we also conclude that all sectorial expenditures are positively correlated to GDP apart from the sectorial expenditures on environment protection which show a negative correlation to GDP. Based on Pearson correlation results, the strongest relationship is seen between sectorial expenditures on education at the coefficient level of 0.9534, social protection at 0.9502, and public order and safety at 0.8130.

Based on the statistical findings, the study concludes that there is a difference seen almost at all levels of the sectorial expenditures in the case of Kosovo in the period 2019–2020–2021 as a result of the COVID-19 pandemic and the war between Russia and Ukraine. An increasing trend of sectorial expenditures during the global COVID-19 pandemic is seen in health sectorial expenditures, social protection expenditures, and sectorial defense expenditures.

The conclusions of the study have a big impact on Kosovo's public spending forecasts. The absence of statistical significance for variables related to defense, health, and public order and safety raises the possibility that these domains do not now have a discernible influence on the examined economic outcomes. This could indicate that other factors are more important in determining economic performance or that resources given to these sectors are not efficiently translating into predicted economic benefits. It could be necessary for policymakers to reevaluate how public monies are allocated to defense, public health, safety, and order. According to the report, present investments made in these sectors could not result in the expected economic gains. A reallocation of resources to industries having a more pronounced effect on stability or economic growth may result from this reevaluation. An assessment of the efficacy and efficiency of spending in these areas may be required. Improvements might be guided by knowing if the lack of significance is the result of misallocation, inefficiencies, or other causes. Improving the way public initiatives are managed and carried out in certain locations might increase their economic effect.

The sectoral expenditures in Kosovo have been a major factor in the country's economic growth, especially when it comes to important sectors like infrastructure, healthcare, and education.

The research highlights the significance of targeted fiscal policies by showing that sectoral expenditure may be strategically allocated to improve productivity and promote overall economic development. Although sectoral investments have accelerated economic growth, continuous evaluation and modification are required to guarantee that resources are efficiently employed and in line with changing economic requirements. This study closes a knowledge vacuum in the sector by providing a detailed examination of the individual effects of several public spending categories (such as infrastructure, health, and education) on economic growth in Kosovo and provides a targeted analysis of Kosovo's economy, which has received little attention in the literature. It adds original information and ideas that will help local and global understanding of the impacts of public spending in transition economies.

The industries that have the most effects on economic growth may be found by looking at the study of public spending. This can give decision-makers solid foundations for allocating resources and optimizing policies. This study helps to evaluate the efficacy of governmental spending. Governments may modify their plans to optimize benefits for residents by identifying the expenditure that yields the best results, and the examination of public spending fosters accountability and openness. These analyses support the development of public institutions' credibility by pointing out possible mishandling or abuses.

Public expenditures are of great interest to policymakers due to their impact on sustaining economic growth and development. Even though via this study we try to test the importance of the sectorial public expenditures on economic growth in the case of Kosovo with the official data obtained from the Kosovo Agency of Statistics, the main limitation of this study is the time period under investigation. The data availability covers the period 2015–2022 which is short. The recommendation for further study is to extend the period under investigation and also the number of countries in analysis. The sectorial expenditures and their type are officially categorized by the Agency of Statistics in the case of Kosovo.

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