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Original Article

Impact of Public Budget Spending and Productivity in the Lambayeque Region, Peru 2022-2023

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Abstract *- This study examines the relationship between public spending and productivity in the Lambayeque Region, Peru, during 2022-2023. It analyzes how the allocation of public resources influences local economic efficiency and development, covering sectors such as industry, entrepreneurship, education, and health. The objective is to promote decent work and economic growth by identifying areas for improvement in public budget management to increase regional productivity and prosperity. With a quantitative, applied, cross-sectional, and correlational approach, Spearman's correlation analysis was used. The results showed a correlation coefficient of 0.691 and a p-value of 0.000, indicating a significant positive correlation (α = 0.05) between public spending and productivity. This suggests that increased public investment is associated with improved production levels and efficiency in the region. The study highlights the importance of adequately allocating public resources to foster economic and social development in Lambayeque. It offers recommendations to optimize the effectiveness of public spending to benefit local communities. The analysis of public spending in the Lambayeque Region during 2022-2023 reveals a significant effort by the regional government to boost productivity through strategic investments. The historic increase in investment spending reached a record of S/ 525 million in 2023, demonstrating a clear commitment to developing infrastructure and key public projects.*

Keywords *- Economy, Productivity, Regional government of Lambayeque, Spending, Finance, Public budget.*

1. Introduction

The analysis of the impact of public budget spending and productivity in the Lambayeque Region, Peru, has become a highly relevant topic due to the persistent challenges in the region's efficiency and economic growth. Lambayeque, located on the northern coast of the country, faces significant problems in various sectors. These include poor infrastructure, inadequate education, insufficient health services, and an industry struggling to modernize. These issues limit its inhabitants' socio-economic development and quality of life, creating an urgent need to evaluate how budget allocations can influence regional productivity and well-being.

The region's public budget faces the complex task of balancing income and expenses, allocating resources efficiently to key sectors to promote sustainable development. However, the lack of adequate budget planning and management has led to ineffective use of resources, reflected in the limited improvement of socio-economic development indicators. This study aims to understand to what extent public investment policies have contributed to Lambayeque's socio-economic progress during the years 2022 and 2023, identifying critical areas that require improvements in budget management. Internationally, research such as Aschauer's has demonstrated the significant influence of public investment on economic productivity. His analysis of the U.S. economy between 1945 and 1985 found that a 10% increase in public spending on infrastructure could generate a 3.9% increase in output. This study used linear regression models and time series analysis to examine the relationship between public spending and productivity [1]. Similarly, Barro, in 1990, distinguished between public goods and services that directly affect the utility of economic agents and those that complement private sector production. His research highlighted that public spending on goods and services that complement private production has a positive effect on investment and economic growth while spending on goods and services that enter the utility function can improve consumption without necessarily increasing production [2]. In a theoretical context, Arrow and Kurz 1970 developed a model in which consumers' utility function depends on both private consumption and the stock of public capital. This model allows for the analysis of how public spending on infrastructure and public services can have a direct impact on consumers' utility, considering public capital as an essential input in private production [3].

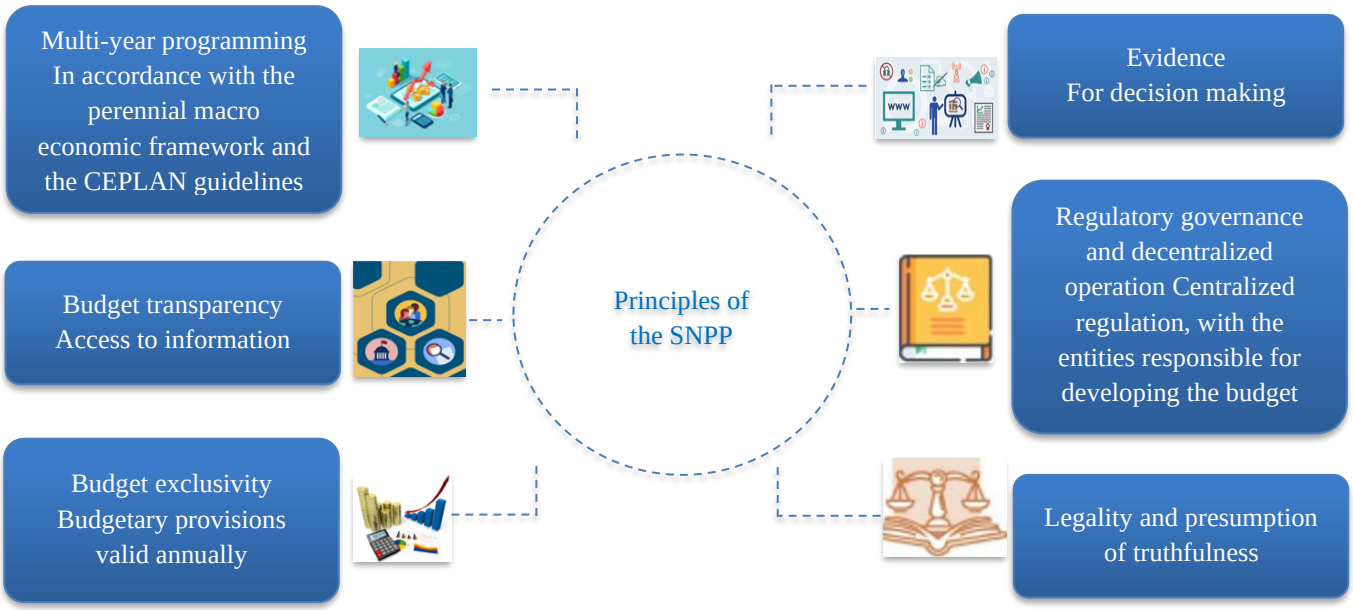

Fig. 1 Principles of the national public budget system

In the Latin American context, Armijo and Espada analyzed the relationship between the quality of public spending and institutional reforms in Latin America, finding that the efficiency of public spending is closely related to the availability of transparent and reliable information. This study highlights the importance of the quality of public spending in promoting economic and social development in the region [4]. In 2015, Carrasco examined results-based budgeting in Peru and its impact on the quality of public spending in the La Libertad Region. His research demonstrated a significant relationship between results-based budgeting and the quality of public spending, with a correlation coefficient of 0.69. This study underscores the need to implement budget management practices that promote spending efficiency and effectiveness [5]. Pozo evaluated the impact of the mining canon redistribution scheme on the well-being of the population in Peru, concluding that the distribution of the canon has not had a significant impact on poverty reduction or improvement in well-being indicators in mining districts.

This study highlights problems in the management and execution of canon resources, as well as the lack of institutional capacities at the local level [6]. In Lambayeque, Díaz Gómez investigated the impact of Results-Based Budgeting on the quality of public spending in the health sector, finding a significant positive relationship [7]. Campos Gonzáles and Figueroa Solano [8] also evaluated the effect of public investment and public spending on the quality of life in regions such as Amazonas, Lambayeque, and La Libertad, discovering that public spending does not significantly contribute to improving the population's quality of life, while public investment has a limited impact. This study aims to identify patterns, trends, and possible areas for improvement in the management of public budgeting to enhance productivity and economic growth in Lambayeque during the 2022-2023 period. To achieve this, the following research questions were posed: i) What is the impact of public budget spending on the productivity of the Lambayeque Region? ii) What is the impact of public budget spending on efficiency in the region?; iii) What is the impact of public budget spending on effectiveness in Lambayeque?; iv) What is the impact of public budget spending on the economic growth of the region? From a theoretical perspective, the Konrad Adenauer Stiftung Foundation highlights the importance of accountability and incentives to maximize the impact of public spending on economic growth [9].

Fig. 2 Lambayeque region

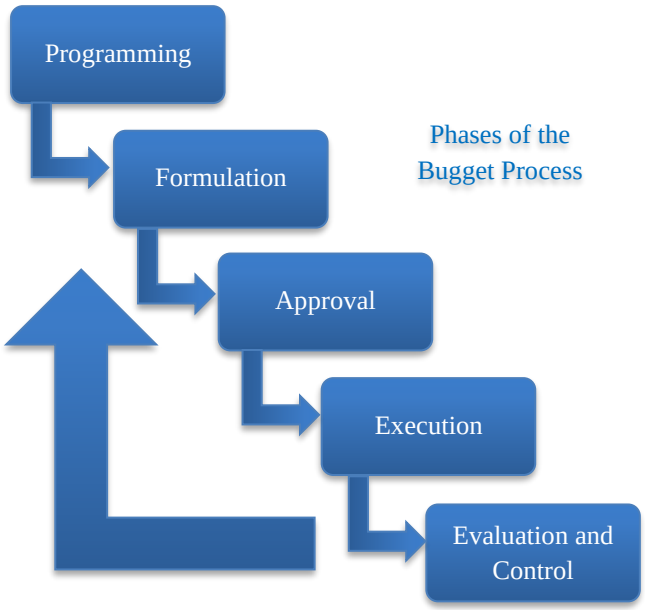

Fig. 3 Phases of the budget process

Practically, Mendoza emphasizes the need to prioritize spending on disaster risk prevention to maintain budgetary balance and avoid negative impacts on macroeconomic and fiscal stability [10]. Regarding methodological justification, to analyze the execution of public spending within the framework of public spending efficiency, according to Cusato and Pastor, a solid methodological justification can be established to investigate the impact of public budget spending on the productivity of the Lambayeque Region [11]. The general objective of this research is to determine the impact of public budget spending on the productivity of the Lambayeque Region, Peru, during 2022-2023. The specific objectives include: (1) Analyzing the impact of public spending on efficiency; (2) Evaluating the impact of public spending on effectiveness; and (3) Examining the impact of public spending on the economic growth of the region.

Finally, following the theoretical contributions of economists such as Stiglitz, this research aims not only to understand the relationship between public spending and productivity but also to advocate for a fair and efficient distribution of public resources to promote equitable and sustainable economic development [12]. In line with the above, the following general hypothesis has been formulated: there is a positive impact of public budget spending on productivity in the Lambayeque Region, Peru, during 2022-2023. The specific hypotheses are: (1) There is a positive impact of public budget spending on efficiency; (2) There is a positive impact of public budget spending on effectiveness; and (3) There is a positive impact of public budget spending on the economic growth of the region. Based on the findings of methodological information for longitudinal studies, including the lines that can be opened on the efficiency and effectiveness of public spending for the benefit of society.

2. Materials and Methods

2.1. Type and Research Design

This research work is applied in nature, gathering current information on public budget spending and productivity in the Lambayeque Region. Hypotheses are formulated, and proposals are created to determine the impact of public budgeting on regional productivity. Applied research uses scientific knowledge to develop practical solutions to specific problems, focusing on applicable tools and processes [13]. The research used a quantitative approach with a non-experimental, cross-sectional design and correlational level, as it gathered information on the variables under study at a specific moment in time without manipulating the independent variables.

According to González, the epistemology associated with the method is fundamental. It is defined as the philosophical study of science, considered a product of two origins: philosophy and the specific discipline of science. This shows that its philosophical basis comes from theory, knowledge, logic, and historical materialism, while the specific disciplines are sociology and the history of science [14]. The non-experimental design is justified as it is an observational study in which variables are not controlled but observed in their real context [15]. The cross-sectional nature implies that information is collected at a single point in time [16], providing a snapshot of the current situation of public spending and its impact on productivity. The correlational level seeks to establish the strength and direction of the relationship between public budget spending and productivity.

2.2. Population, Sample and Sampling

In this study, the population was represented by 1,260,650 inhabitants of the Lambayeque department. According to Camacho de Báez, the population is defined as the set of all cases that meet a series of specifications [17]. To determine the appropriate sample, the study first identified the subjects that met the relevant specifications, ensuring the population in question was homogeneous and representative of the region. The selected sample consisted of 50 inhabitants of the Lambayeque department. According to Bianchi, the sample should be a representative part of the population, and its characteristics should accurately reflect those of the total population [18]. The sample was selected using non-probabilistic convenience sampling. As described by Hernández et al., this type of sampling is used when sample elements are chosen based on their accessibility and proximity to the researcher, facilitating data collection in situations where the probability of selection cannot be determined [19]. This method allowed for quicker and more efficient data collection, although it has limitations in terms of generalizing the results. Convenience sampling was justified, given the context and practical constraints of the study. According to Gutiérrez, sampling is a statistical technique that provides precise information about the population and its elements [20][19].

Fig. 4 Monitoring & controlling

In this case, participants who were easily available and willing to provide the necessary information were selected. Despite the inherent limitations of this type of sampling, measures were taken to ensure the sample included sufficient diversity in terms of age, gender, and occupation to obtain a balanced perspective on the impact of public budget spending on productivity in the Lambayeque Region.

2.3. Operationalization of Variables

The independent variable in this study is public budget spending, which represents a quantitative variable. Conceptually, Mendoza and Yanes define the impact of public spending as the consequences and effects of the allocation of public resources on the economy and society, including its incidence on economic growth, regional economic dynamics, inequality, and the provision of public services [21]. Operationally, Cruz and Esquen mention Adolph Wagner's theory, developed in 1883, which posits an increase in per capita income as economic development progresses. Public spending is considered a cost and is budgeted by prioritizing certain sectors. In Peru, the budget is prepared by the executive branch, which is responsible for distributing it appropriately [22]. The indicators for the independent variable include the execution of works, delegation of responsibilities, and development of the dimension of local authorities' behavior. Indicators of the command-and-control capacity dimension include decision-making capabilities, the command-and-control system, and the process phases. In the financial information dimension, the indicators are income, expenses for the period, and investment, all measured on a Likert scale. The dependent variable is productivity, which also represents a quantitative variable. Prokopenko defines productivity as an economic measure that determines how many products and services can be produced with the help of different resources, such as workers, money, time, and land, over a specified period [23]. Operationally, Render and Heizer define productivity as the ratio between outputs (goods and services) and one or more inputs (resources such as labor and capital) [24]. The indicators for the efficiency dimension include the optimal combination of resources in public spending, the harmonious outcome between spending on technology, human resources, organization, systems, and the achievement of objectives. For the effectiveness dimension, the indicators are accuracy in executing public spending, the quantity of public goods and services produced per unit of public spending, and the use of resources. The indicators for the economic growth dimension are the consumer price index, gross domestic product, and the poverty rate, all measured on Likert scales.

2.4. Data Collection Techniques and Instruments

For data collection, the survey technique was employed, as it allows for obtaining data systematically and in detail. [25] This technique is particularly suitable for quantitative studies that collect information from a representative population sample. The surveys were designed to capture the perceptions and experiences of participants regarding the impact of public budget spending on the productivity of the Lambayeque Region. The instrument used was a structured questionnaire, which included questions on a Likert scale [26].

This scale allowed respondents to evaluate various aspects related to public spending and its impact on regional productivity, providing a quantitative measure of their perceptions. The questionnaire questions were developed based on a literature review and previous studies, ensuring they covered all relevant dimensions of the subject under study. The surveys were designed to collect detailed information on the impact of public budget spending on the region's productivity, efficiency, effectiveness, and economic growth. Structured questionnaires with Likert scale questions were used, allowing respondents to evaluate various aspects related to public spending and their perception of regional productivity. Before administering the surveys, a pilot test was conducted to validate the instruments and ensure their reliability, resulting in a Cronbach's alpha of 0.988.

Table 1. Instrument reliability

Cronbach's Alpha	Number of Items
988	36

2.5. Data Collection Procedure

The data collection procedure was developed in several stages to ensure a systematic and rigorous approach. Initially, relevant information sources were identified, including both primary and secondary data. Primary data were obtained through surveys administered via Google Forms to a representative sample of the Lambayeque Region's population, consisting of 50 inhabitants selected through non-probabilistic convenience sampling. This type of sampling allowed for the selection of participants based on their accessibility and proximity to the researcher, facilitating data collection.

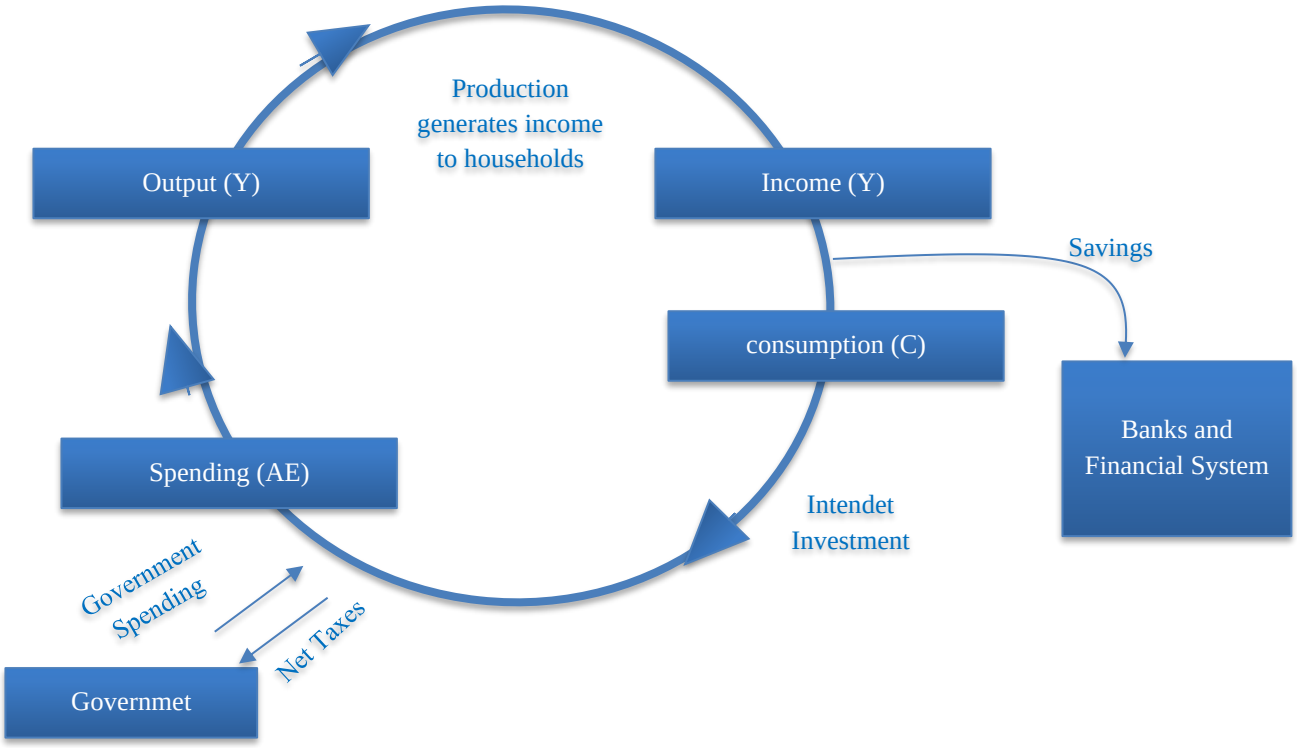

Fig. 5 Banks and financial system

During the data collection process, invitations were sent to the selected participants via email and direct messages, providing the link to the Google Forms questionnaire. The purpose of the study, data collection procedures, and the assurance of voluntary participation and confidentiality were explained to the participants. Informed consent was obtained from all respondents, who were informed about the study's purpose, data collection procedures, and their right to withdraw at any time without negative consequences.

Monitoring and follow-up during the data collection period ensured that participants completed the questionnaire and allowed for resolving any doubts or technical issues they might encounter. Finally, the collected data were coded and organized into a database for subsequent analysis, ensuring the integrity and consistency of the obtained data.

2.6. Data Analysis Method

The data analysis was conducted using quantitative methods with the statistical software SPSS [27]. Initially, descriptive and exploratory analyses were performed to obtain an overview of participants' responses, calculating frequencies, means, and standard deviations. These analyses helped identify preliminary patterns and trends and detect potential anomalies or outliers that could influence the final results. To evaluate the relationship between public budget spending and productivity, Spearman's correlation coefficient was used, suitable for non-parametric data. This technique allowed for determining the strength and direction of the association between the quantitative variables. Additionally, hypothesis tests were conducted to confirm the statistical significance of the results, using a significance level of $\alpha = 0.05$. These tests were essential to validate the observed associations between public spending and the dimensions of efficiency, effectiveness, and economic growth.

Finally, the obtained results were interpreted in the context of the theoretical framework and the hypotheses stated at the beginning of the study. A detailed analysis of the findings was conducted, identifying practical implications for public budget management in the Lambayeque Region.

2.7. Ethical Aspects

The research was conducted under strict ethical standards to ensure the integrity and reliability of the data while respecting the rights of the participants. Informed consent was obtained from all respondents, who were informed about the study's purpose, data collection procedures, and their right to withdraw at any time without negative repercussions. The confidentiality and anonymity of the participants were guaranteed by securely storing the data, accessible only to the authorized research team. Principles of transparency and accountability were maintained throughout all stages of the study, presenting results honestly and objectively and complying with the ethical norms of academic institutions and relevant organizations [28]. Additionally, all citations and references were made according to APA 7th edition standards to ensure proper source attribution and academic rigor [29].

3. Results and Discussion

3.1. Results

The results presented include both descriptive and inferential statistics. For the descriptive statistics, the rating scales for each variable were considered. The distribution of each variable, along with its corresponding dimensions, was analyzed, and the relationships were presented through two-dimensional tables.

Table 2 provides a rating scale for the variable of public budget spending and its dimensions, establishing score ranges to evaluate the levels of agreement. The main variable ranged from 18 to 90 points, classified as disagreement (18-41), neutral (42-65), and agreement (66-90). The specific dimensions, including the behavior of local authorities, command and control capacities, and financial information, each had a range of 6 to 30 points, with categories of disagreement (6-13), neutral (14-21), and agreement (22-30). Table 3 shows the distribution of the public budget expenditure variable according to the respondents' answers. 60% of participants expressed disagreement, 36% remained neutral, and only 4% agreed. The total sample consisted of 50 respondents, clearly reflecting a predominant trend towards disagreement regarding the management of public budget expenditure.

Table 4 reflects the distribution of the dimensions of public budget expenditure. Regarding the behavior of local authorities, 52% of respondents disagreed, 44% were neutral, and 4% agreed. For command-and-control capacities, 62% expressed disagreement, 34% were neutral, and 4% agreed. In the dimension of financial information, 62% also disagreed, 32% remained neutral, and 6% agreed. The total sample encompassed 50 participants in each dimension.

Table 2. Rating scale for public budget spending and its dimensions

Variable/Dimension	Points		Levels		
	Minimum	Maximum	Disagreement	Neutral	Agreement
Public Budget Spending	18	90	18-41	42-65	66-90
Behavior of Local Authorities	6	30	6-13	14-21	22-30
Command and Control Capacities	6	30	6-13	14-21	22-30
Financial Information	6	30	6-13	14-21	22-30

Table 3. Rating scale for the public budget expenditure variable with its dimensions

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Disagreement	30	60,0	60,0	60,0
	Neutral	18	36,0	36,0	96,0
	Agreement	2	4,0	4,0	100,0
	Total	50	100,0	100,0	

Table 4. Distribution of the dimensions of the public budget expenditure variable

Variable/Dimension	Disagreement		Neutral		Agreement		Total	
	N	%	N	%	N	%	N	%
Behavior of Local Authorities	26	52	22	44	2	4	50	100%
Command and Control Capacities	31	62	17	34	2	4	50	100%
Financial Information	31	62	16	32	3	6	50	100%

Table 5 presents the rating scale for the productivity variable and its dimensions, defining score ranges for different levels of agreement. The main variable, productivity, ranged between 18 and 90 points, categorized as disagreement (18-41), neutral (42-65), and agreement (66-90).

The specific dimensions, including efficiency, effectiveness, and economic growth, ranged between 6 and 30 points each, with levels of disagreement (6-13), neutral (14-21), and agreement (22-30).

Table 6 shows the distribution of the productivity variable according to the respondents' answers. 50% of participants expressed disagreement, 46% remained neutral, and only 4% agreed. The total sample consisted of 50 respondents, indicating a significant trend towards disagreement regarding productivity, although a considerable proportion also remained neutral. Table 7 reflects the distribution of the dimensions of the productivity variable.

Regarding efficiency, 40% of respondents disagreed, 54% were neutral, and 6% agreed. For the effectiveness dimension, 41% expressed disagreement, 52% were neutral, and 6% agreed. In the economic growth dimension, 44% disagreed, 53% remained neutral, and 4% agreed.

The total sample encompassed 50 participants in each dimension, showing a general trend towards neutrality in these dimensions, although with a significant proportion of disagreement.

Table 5. Rating scale for the productivity variable and its dimensions

Variable/Dimension	Points		Levels		
	Minimum	Maximum	Desacuerdo	Minimum	Maximum
Productivity	18	90	18-41	42-65	66-90
Efficiency	6	30	6-13	14-21	22-30
Effectiveness	6	30	6-13	14-21	22-30
Economic Growth	6	30	6-13	14-21	22-30

Table 6. Distribution of the productivity variable

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Disagreement	25	50,0	50,0	50,0
	Neutral	23	46,0	46,0	96,0
	Agreement	2	4,0	4,0	100,0
	Total	50	100,0	100,0	

Table 7. Distribution of the dimensions of the productivity variable

Variable/Dimension	Disagreement		Neutral		Agreement		Total	
	N	%	N	%	N	%	N	%
Efficiency	20	40	27	54	3	6	50	100%
Effectiveness	21	41	26	52	3	6	50	100%
Economic Growth	22	44	26	53	2	4	50	100%

Table 8 and Figure 6 present the relationship between the variables of public budget expenditure and productivity. Among the respondents who disagreed with public budget expenditure, 23 also disagreed with productivity, 7 were neutral, and none agreed; among those who were neutral regarding expenditure, 2 disagreed with productivity, 16 were neutral, and none agreed. Finally, among those who agreed with public budget expenditure, none disagreed or were neutral regarding productivity, while 2 agreed. In total, 50 respondents showed a notably high correlation between disagreement in both variables.Table 9 and Figure 7 show the relationship between the variables of public budget expenditure and efficiency. Among the respondents who disagreed with public budget expenditure, 17 disagreed with efficiency, 13 were neutral, and none agreed; among those who were neutral regarding expenditure, 3 disagreed with efficiency, 14 were neutral, and 1 agreed. Finally, among those who agreed with public budget expenditure, none disagreed or were neutral regarding efficiency, while 2 agreed.

Table 8. Cross-tabulation of the variables of public budget expenditure and productivity

		Productivity			Total
		Disagreement	Neutral	Agreement	
Public Budget Expenditure	Disagreement	23	7	0	30
	Neutral	2	16	0	18
	Agreement	0	0	2	2
Total		25	23	2	50

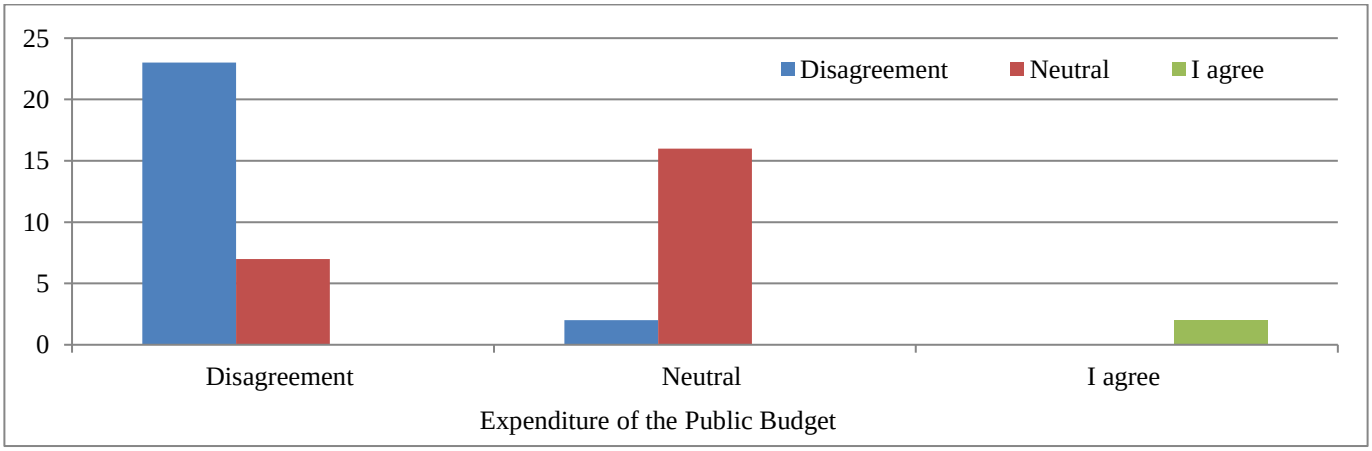

Fig. 6 Cross-tabulation of the variables public budget expenditure and productivity

Table 9. Cross-tabulation of the variables of public budget expenditure and efficiency

		Efficiency			Total
		Disagreement	Neutral	Agreement	
Public Budget Expenditure	Disagreement	17	13	0	30
	Neutral	3	14	1	18
	Agreement	0	0	2	2
Total		20	27	3	50

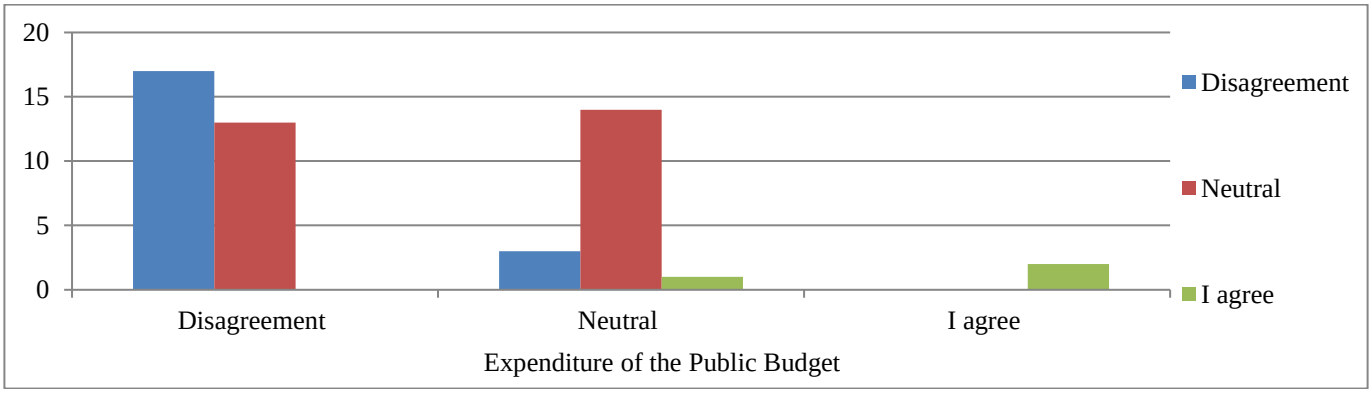

Fig. 7 Cross-tabulation of the variables public budget expenditure and efficiency

Table 10 and Figure 8 show the relationship between the variables of public budget expenditure and effectiveness. Among the respondents who disagreed with public budget expenditure, 18 also disagreed with effectiveness, 11 were neutral, and 1 agreed; among those who were neutral regarding expenditure, 3 disagreed with effectiveness, 15 were neutral, and none agreed. Finally, among those who agreed with public budget expenditure, none disagreed or were neutral regarding effectiveness, while 2 agreed. Table 11 and Figure 9 show the relationship between public budget expenditure and economic growth. Among the respondents who disagreed with budget expenditure, 21 disagreed with economic growth, 9 were neutral, and none agreed. Among those who were neutral regarding expenditure, 1 disagreed with economic growth, 17 were neutral, and none agreed. Finally, among those who agreed with budget expenditure, none disagreed or were neutral regarding economic growth, while 2 agreed.

Table 10. Cross-tabulation of the variables of public budget expenditure and effectiveness

		Effectiveness			Total
		Disagreement	Neutral	Agreement	
Public Budget Expenditure	Disagreement	18	11	1	30
	Neutral	3	15	0	18
	Agreement	0	0	2	2
Total		21	26	3	50

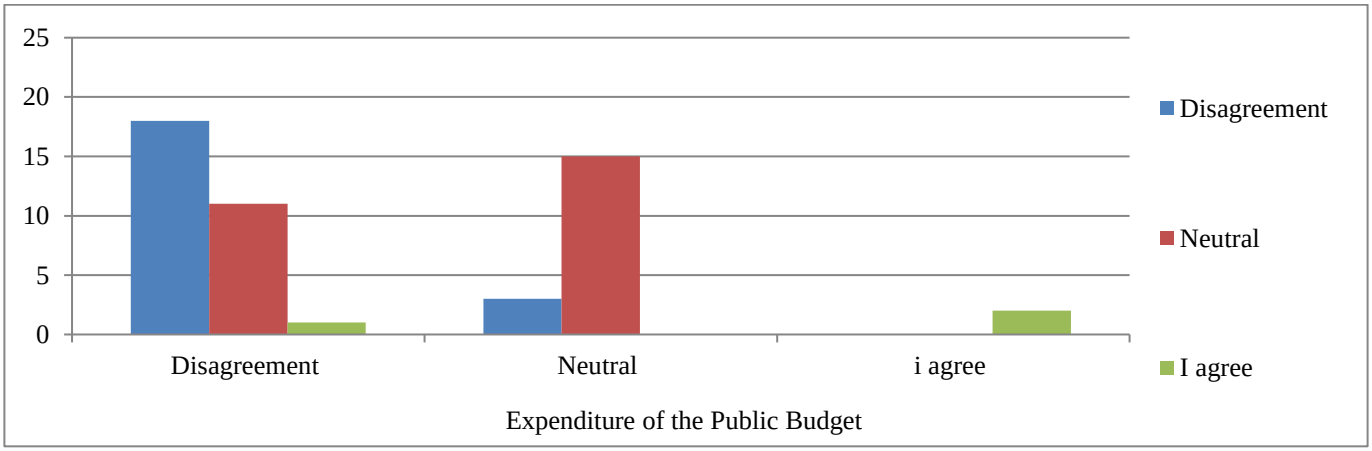

Fig. 8 Cross-tabulation of the variables public budget expenditure and effectiveness

Table 11. Cross-tabulation of the variables of public budget expenditure and economic growth

		Economic Growth			Total
		Disagreement	Neutral	Agreement	
Public Budget Expenditure	Disagreement	21	9	0	30
	Neutral	1	17	0	18
	Agreement	0	0	2	2
Total		22	26	2	50

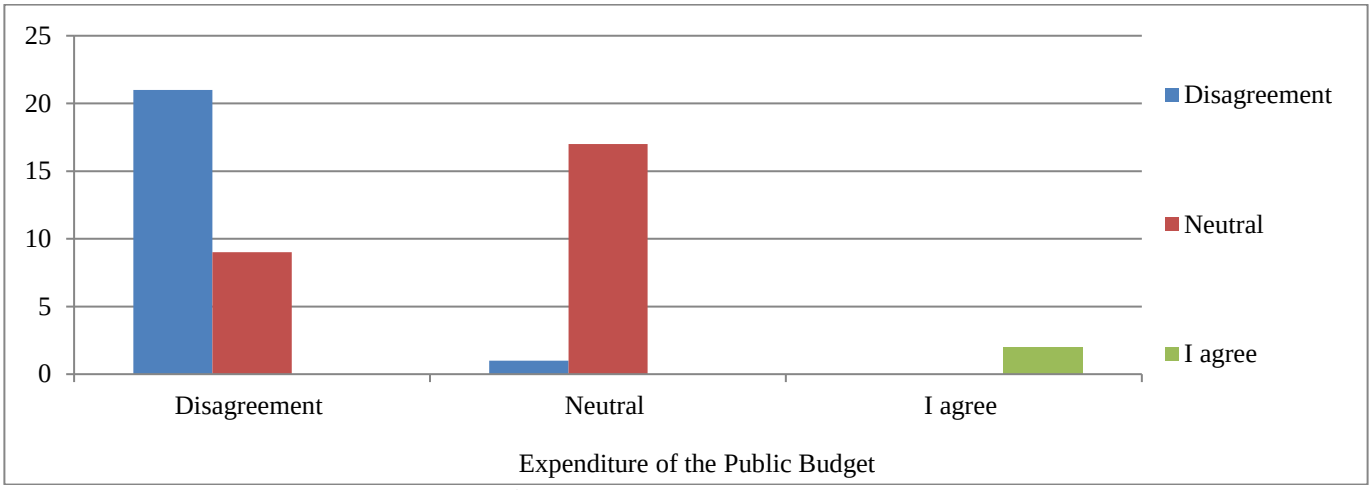

Fig. 9 Cross-tabulation of the variables public budget expenditure and economic growth

Inferential analysis was crucial to address the hypotheses posed, allowing verification and analysis in accordance with the study's objectives.

Normality Hypothesis:

- H0: The figures follow a normal distribution.
- H1: The figures do not follow a normal distribution.

The Shapiro-Wilk test was used to assess the normality of the variables and their dimensions. For all the analyzed variables (public budget expenditure, behavior of local authorities, command and control capacities, financial information, productivity, efficiency, effectiveness, and economic growth), the p-value was 0.000, less than the significance level $\alpha = 0.05$. Therefore, the null hypothesis (H0) that the figures follow a normal distribution was rejected, and the alternative hypothesis (H1) that the figures do not follow a normal distribution was accepted.

Table 13 presents the confirmation of the general hypothesis through Spearman's correlation coefficient between public budget expenditure and productivity. The correlation coefficient was 0.691, with a p-value of 0.000, less than the significance level $\alpha = 0.05$. According to the provided decision rule, the null hypothesis (H0) that there is no positive impact of public budget expenditure on productivity in the Lambayeque Region was rejected. The alternative hypothesis (H1) that there is a positive impact between these variables was accepted. Additionally, the value of 0.691 falls within the range of 0.51 to 0.75, indicating a considerable positive correlation.

- H0: There is no positive impact of Public Budget Expenditure on Productivity in the Lambayeque Region, Peru, 2022-2023.
- H1: There is a positive impact of Public Budget Expenditure on Productivity in the Lambayeque Region, Peru, 2022-2023.

Table 12. Normality test of the variables with their respective dimensions

Variable	Shapiro-Wilk		
	Statistic	gl	Sig.
Public Budget Expenditure	687	50	000
Behavior of Local Authorities	716	50	000
Command and Control Capacities	677	50	000
Financial Information	684	50	000
Productivity	720	50	000
Efficiency	744	50	000
Effectiveness	745	50	000
Economic Growth	725	50	000

Table 13. Test of the general research hypothesis

			Public Budget Expenditure	Productivity
Spearman's Rho	Public Budget Expenditure	Correlation Coefficient	1,000	691**
		Sig. (bilateral)	.	000
		N	50	50
	Productivity	Correlation Coefficient	691**	1,000
		Sig. (bilateral)	000	.
		N	50	50

Table 14 confirms Specific Hypothesis 1 through Spearman's correlation coefficient between public budget expenditure and efficiency. The correlation coefficient was 0.499, with a p-value of 0.000, less than the significance level $\alpha = 0.05$. According to the provided decision rule, the null hypothesis (H0) that there is no positive impact of public budget expenditure on efficiency in the Lambayeque Region was rejected. The alternative hypothesis (H1) that there is a positive impact between these variables was accepted.

Additionally, the value of 0.499 falls within the range of 0.11 to 0.50, indicating a moderate positive correlation.

- H0: There is no positive impact of public budget expenditure on efficiency in the Lambayeque Region, Peru, 2022-2023.
- H1: There is a positive impact of public budget expenditure on efficiency in the Lambayeque Region, Peru, 2022-2023.

Table 15 confirms Specific Hypothesis 2 through Spearman's correlation coefficient between public budget expenditure and effectiveness. The correlation coefficient was 0.479, with a p-value of 0.000, less than the significance level $\alpha = 0.05$. According to the provided decision rule, the null hypothesis (H0) that there is no positive impact of public budget expenditure on effectiveness in the Lambayeque Region was rejected. The alternative hypothesis (H1) that there is a positive impact between these variables was accepted. Additionally, the value of 0.479 falls within the range of 0.11 to 0.50, indicating a moderate positive correlation.

- H0. There is no positive impact of public budget expenditure on effectiveness in the Lambayeque Region, Peru, 2022-2023.
- H1. There is a positive impact of public budget expenditure on effectiveness in the Lambayeque Region, Peru, 2022-2023.

Table 14. Test of specific research hypothesis 1

			Public Budget Expenditure	Efficiency
Spearman's Rho	Public Budget Expenditure	Correlation Coefficient	1,000	499**
		Sig. (bilateral)	.	000
		N	50	50
	Efficiency	Correlation Coefficient	499**	1,000
		Sig. (bilateral)	000	.
		N	50	50

Table 15. Test of specific research hypothesis 2

			Public Budget Expenditure	Effectiveness
Spearman's Rho	Public Budget Expenditure	Correlation Coefficient	1,000	479**
		Sig. (bilateral)	.	000
		N	50	50
	Effectiveness	Correlation Coefficient	479**	1,000
		Sig. (bilateral)	000	.
		N	50	50

Table 16. Test of specific research hypothesis 3

			Public Budget Expenditure	Economic Growth
Spearman's Rho	Public Budget Expenditure	Correlation Coefficient	1,000	683**
		Sig. (bilateral)	.	000
		N	50	50
	Economic Growth	Correlation Coefficient	683**	1,000
		Sig. (bilateral)	000	.
		N	50	50

Table 16 confirms Specific Hypothesis 3 through Spearman's correlation coefficient between public budget expenditure and economic growth. The correlation coefficient was 0.683, with a p-value of 0.000, less than the significance level $\alpha = 0.05$. According to the provided decision rule, the null hypothesis (H0) that there is no positive impact of public budget expenditure on economic growth in the Lambayeque Region was rejected. The alternative hypothesis (H1) that there is a positive impact between these variables was accepted. Additionally, the value of 0.683 falls within the range of 0.51 to 0.75, indicating a considerable positive correlation.

H0: There is no positive impact of public budget expenditure on economic growth in the Lambayeque Region, Peru, 2022-2023.

H1: There is a positive impact of public budget expenditure on economic growth in the Lambayeque Region, Peru, 2022-2023.

3.2. Discussion

The general objective of the study was to determine the impact of public budget spending on productivity in the Lambayeque Region, Peru, during the years 2022-2023, aiming to understand how public investment influences regional economic performance, especially in terms of productivity. This research found a considerable positive correlation between public budget spending and productivity, indicating that an increase in public spending is significantly associated with improvements in regional productivity. Comparing these results with previous studies, Aschauer found that spending on infrastructure and public services in the U.S. increased productivity by 3.9% for every 10% increase in spending [1].

Although our findings align with the positive direction of the relationship, the magnitudes differ due to contextual and temporal differences. Barro highlighted that only spending that complements private production significantly impacts investment and growth [2]. Our research partially supports this, showing that spending on infrastructure is crucial for productivity. Additionally, Carrasco's study [5] in La Libertad, Peru, showed a significant relationship between results-based budget management and the quality of public spending, suggesting that efficient budget management improves productivity. Díaz Gómez [7] also found that Results-Based Budgeting significantly impacts the quality of spending in the health sector of Lambayeque, indicating that effective and well-defined public spending management improves the quality of spending and regional productivity. The similarities between our findings and previous studies can be explained by using similar theoretical approaches, which consider spending on infrastructure as a key input in the production function.

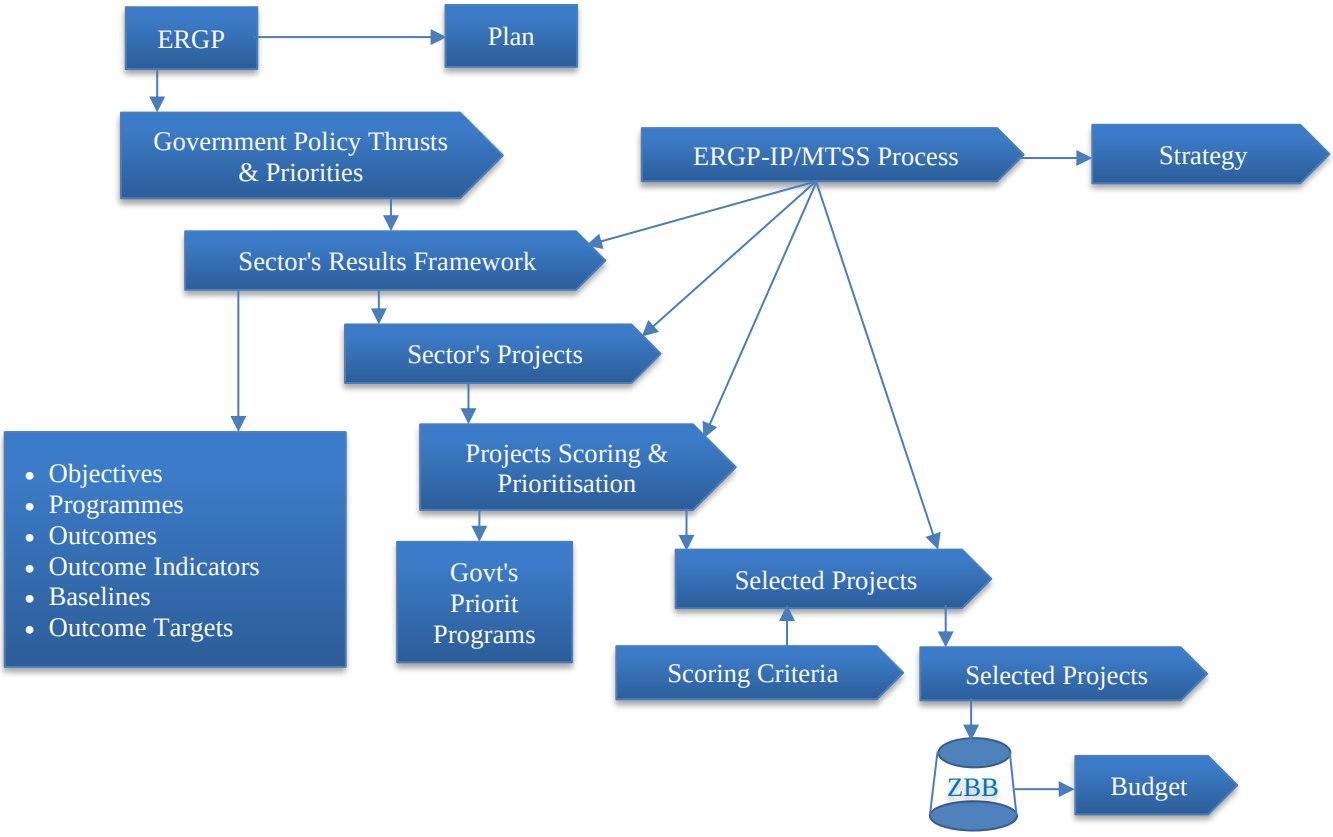

Fig. 10 Budget linkage

Differences in magnitude are due to methodological and contextual variations, such as the time scale and specific economic conditions of Lambayeque compared to the United States. Additionally, local policies and the effectiveness of public spending execution can also influence the observed impact magnitude. The study found that public budget spending significantly improves productivity in the Lambayeque Region, supporting previous theories on the importance of public investment in infrastructure and services for economic performance. However, methodological and contextual aspects must be considered when interpreting these results, and it is essential to develop public policies that optimize spending management and execution to maximize their impact on regional productivity.

Regarding the first specific objective, determining the impact of public budget spending on efficiency in the Lambayeque Region, a medium positive correlation was found between public budget spending and efficiency. Comparing these results with previous studies, Barro highlighted the importance of distinguishing between types of public spending, suggesting that only those that complement private production will have a significant positive impact on efficiency [2]. This study partially supports this theory, showing that certain types of public spending can improve efficiency.

Additionally, Armijo and Espada found that the efficiency of public spending in Latin America largely depends on institutional reforms and the quality of public resource management [4], which aligns with the current findings, suggesting that institutional and administrative factors may influence efficiency in Lambayeque. Carrasco's study [5] in La Libertad showed a significant relationship between results-based budget management and the quality of public spending. Although this research shows a medium correlation, this difference in magnitude could be due to variations in budget management and local conditions in Lambayeque compared to La Libertad. The observed similarities and differences can be explained by the methodological and contextual particularities of each study.

In Lambayeque, the implementation of public policies and administrative management are crucial for the efficiency of public spending. Variations in the magnitude of the relationships can be attributed to differences in management practices and the available administrative infrastructure in each region. Regarding the second specific objective, determining the impact of public budget spending on effectiveness in the Lambayeque Region, a medium positive correlation was found between public budget spending and effectiveness.This finding indicates that an increase in public spending can lead to improvements in effectiveness, although the magnitude of this relationship is moderate [30]. Comparing these results with previous studies, Armijo and Espada suggested that the effectiveness of public spending is closely related to the quality of institutional reforms and resource management, highlighting the importance of defining clear performance sub-indicators and having transparent information [4].

The current results align with these findings, indicating that effective policies and institutional reforms may influence improvements in effectiveness in Lambayeque. Díaz Gómez [7] also showed that Results-Based Budgeting significantly impacts the quality of public spending in the health sector of Lambayeque. Although our research shows a medium correlation, this difference in magnitude could be due to variations in the specific sectors analyzed and the particular conditions of each area within Lambayeque. The observed similarities and differences can be attributed to each study's methodological and contextual particularities. In Lambayeque, the implementation of public policies and administrative management are fundamental for the effectiveness of public spending.

Finally, regarding the third specific objective, determining the impact of public budget spending on economic growth in the Lambayeque Region, a considerable positive correlation was found between public budget spending and economic growth. Comparing these results with previous studies, Campos González and Figueroa Solano [8] found that public investment had a limited impact on quality of life, with an insignificant effect on the human development index. However, our study shows a significant impact of public spending on economic growth in Lambayeque. This difference may be due to variations in the execution and targeting of public spending in different regions and sectors. Additionally, Pozo [5] studied the impact of the mining canon on the population's well-being in Peru and did not find a significant effect on poverty reduction or improvement in well-being indicators.

Fig. 11 Public finance

In contrast, our results indicate that public spending in Lambayeque positively impacts economic growth. This suggests that factors such as efficient management and correct allocation of resources may be crucial for the observed results. The observed similarities and differences can be attributed to each study's methodological and contextual particularities. In Lambayeque, implementing public policies and administrative management are crucial for the economic growth derived from public spending.This article presents key measures that policymakers can adopt to optimize public spending, such as redirecting resources, improving procurement management, and implementing continuous evaluation systems. These strategies seek to increase spending efficiency and maximize its positive impact on the social and economic development of our Lambayeque Region.

4. Conclusion

The correlation analysis between public budget spending and productivity reveals a significant positive correlation. This indicates that an increase in public investment is associated with improved levels of production and efficiency in the Lambayeque region, suggesting that higher public investment translates to higher levels of regional productivity. The analysis of the relationship between public budget spending and efficiency suggests a moderate positive correlation, highlighting the importance of effective public resource management to improve operational efficiency. This also suggests that there are additional areas of optimization that could further increase efficiency over time. A moderate positive correlation was observed between public budget spending and effectiveness. This implies that public spending contributes to the effectiveness of implementing programs and policies, thus improving specific outcomes and goals in the Lambayeque region. The analysis of public spending in the Lambayeque Region during 2022-2023 reveals a significant effort by the regional government to boost productivity through strategic investments.

The historic increase in investment spending reached a record of S/ 525 million in 2023, demonstrating a clear commitment to developing infrastructure and key public projects. Finally, the analysis of the relationship between public budget spending and economic growth shows a significant positive correlation, confirming that public budget spending substantially impacts the region's economic growth.

This considerable observed correlation highlights how public investments drive economic growth, emphasizing the importance of efficient allocation and management of resources to foster regional development. In conclusion, the regional government of Lambayeque in the year 2022 in the PIA has an expenditure of S/1,458,422,553, unlike the regional government of the department of Cajamarca, which spent S/2,410,377,765 and the regional government of the department of Amazonas, with an expenditure of S/958,794,404.

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