ANALYZING THE LINK BETWEEN GOVERNMENT BUDGET EXPENDITURES AND ECONOMIC GROWTH: A CASE STUDY OF UZBEKISTAN'S EXPERIENCE

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Purpose: This study aims to examine the relationship between government spending and economic growth in Uzbekistan using quarterly data from 2000 to 2020. Specifically, it investigates the short and long-term causal links between GDP and government budget expenditures through the utilization of the Engle-Granger Cointegration and Error Correction Model (ECM).

Theoretical framework: The theoretical framework of this study draws on the principles of Keynesian economics and Wagner's Law. Keynesian economics posits that increased government spending can stimulate economic growth, particularly during periods of economic downturns. In the context of this study, it suggests that higher government budget expenditures contribute to GDP growth in Uzbekistan. Wagner's Law, on the other hand, postulates that as an economy expands, the functions and size of the government also grow.

Methodology: The study utilizes the Engle-Granger Cointegration and ECM to analyze the relationship between GDP and government budget expenditures in Uzbekistan. Statistical tests, such as p-values, R-squared, adjusted R-squared, and Durbin-Watson statistic, are employed to evaluate the significance and goodness-of-fit of the models.

Findings: The results indicate a positive correlation between government spending and GDP. A 1% increase in government budget expenditures corresponds to a 0.50% increase in GDP, while holding other factors constant. The relationship is statistically significant at the 1% level. The ECM reveals significant error correction terms for both variables, suggesting a correction towards the long-term equilibrium.

Research, Practical & Social implications: These findings imply that increased government spending can contribute to economic growth in Uzbekistan. The results support the principles of Keynesian economics, which advocate for fiscal stimulus during economic downturns. Additionally, the study aligns with Wagner's Law, indicating that as the economy grows, the size and functions of the government also expand. Policymakers can utilize these findings to inform decisions regarding government budget allocations and economic development strategies.

Originality/Value: This study provides empirical evidence on the relationship between government budget expenditures and economic growth in Uzbekistan. The utilization of the Engle-Granger Cointegration and ECM models enhances the understanding of the dynamics and long-term equilibrium between GDP and government spending. The findings contribute to the existing literature on fiscal policy and economic growth in emerging economies.

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ANALISANDO A LIGAÇÃO ENTRE AS DESPESAS DO ORÇAMENTO DO GOVERNO E O CRESCIMENTO ECONÔMICO: UM ESTUDO DE CASO DA EXPERIÊNCIA DO UZBEQUISTÃO

RESUMO

Objetivo: Este estudo tem como objetivo examinar a relação entre gastos governamentais e crescimento econômico no Uzbequistão usando dados trimestrais de 2000 a 2020. Especificamente, ele investiga os vínculos causais de curto e longo prazo entre o PIB e as despesas do orçamento do governo através da utilização do Modelo de Cointegração e Correção de Erros (ECM) Engle-Granger.

Estrutura teórica: A estrutura teórica deste estudo baseia-se nos princípios da economia keynesiana e da Lei de Wagner. A economia keynesiana postula que o aumento da despesa pública pode estimular o crescimento econômico, particularmente durante períodos de recessão econômica. No contexto deste estudo, sugere-se que as despesas orçamentais públicas mais elevadas contribuem para o crescimento do PIB no Usbequistão. Já a Lei de Wagner postula que, à medida que a economia se expande, as funções e o tamanho do governo também aumentam.

Metodologia: O estudo utiliza a Cointegração de Engle-Granger e ECM para analisar a relação entre o PIB e as despesas do orçamento do governo no Uzbequistão. Testes estatísticos, como valores p, R-quadrado, R-quadrado ajustado, e estatística de Durbin-Watson, são empregados para avaliar a significância e a bondade do ajuste dos modelos.

Conclusões: Os resultados indicam uma correlação positiva entre a despesa pública e o PIB. Um aumento de 1% nas despesas públicas corresponde a um aumento de 0,50% no PIB, mantendo constantes outros fatores. A relação é estatisticamente significante no nível de 1%. O ECM revela termos significativos de correção de erros para ambas as variáveis, sugerindo uma correção em direção ao equilíbrio de longo prazo.

Investigação, implicações práticas e sociais: estas conclusões implicam que o aumento da despesa pública pode contribuir para o crescimento econômico no Uzbequistão. Os resultados apoiam os princípios da economia keynesiana, que defendem o estímulo fiscal durante as crises econômicas. Além disso, o estudo se alinha à Lei de Wagner, indicando que, à medida que a economia cresce, o tamanho e as funções do governo também se expandem. Os legisladores podem utilizar estas conclusões para fundamentar as decisões relativas às dotações orçamentais do governo e às estratégias de desenvolvimento econômico.

Originalidade/Valor: Este estudo fornece evidências empíricas sobre a relação entre as despesas do orçamento do governo e o crescimento econômico no Uzbequistão. A utilização dos modelos Engle-Granger Cointegration e ECM melhora a compreensão da dinâmica e do equilíbrio de longo prazo entre o PIB e os gastos do governo. As conclusões contribuem para a literatura existente sobre política orçamental e crescimento econômico nas economias emergentes.

Palavras-chave: Despesas do Orçamento do Governo, Crescimento Econômico, PIB, Cointegração Engle-Granger, Modelo de Correção de Erros (ECM), Economia Keynesiana, Lei de Wagner.

ANALIZAR EL VÍNCULO ENTRE EL GASTO DEL PRESUPUESTO GUBERNAMENTAL Y EL CRECIMIENTO ECONÓMICO: UN ESTUDIO DE CASO DE LA EXPERIENCIA DE UZBEKISTÁN

RESUMEN

Objetivo: Este estudio tiene por objeto examinar la relación entre el gasto público y el crecimiento económico en Uzbekistán utilizando datos trimestrales de 2000 a 2020. Específicamente, investiga los vínculos causales a corto y largo plazo entre el PIB y los gastos presupuestarios gubernamentales utilizando el Modelo de Cointegración Engle-Granger y Corrección de Errores (MCI).

Estructura teórica: La estructura teórica de este estudio se basa en los principios de la economía keynesiana y la ley Wagner. La economía keynesiana sostiene que el aumento del gasto público puede estimular el crecimiento económico, en particular durante períodos de recesión económica. En el contexto de este estudio, se sugiere que el aumento del gasto público contribuye al crecimiento del PIB en Uzbekistán. Pero la Ley de Wagner dice que a medida que la economía se expande, las funciones y el tamaño del gobierno también aumentan.

Metodología: El estudio utiliza la cointegración de Engle-Granger y ECM para analizar la relación entre el PIB y el gasto presupuestario del Gobierno en Uzbekistán. Se utilizan pruebas estadísticas, como, por ejemplo, valores p, R-cuadrado, R-cuadrado ajustado y las estadísticas de Durbin-Watson, para evaluar la importancia y la bondad del ajuste de modelos.

Conclusiones: Los resultados indican una correlación positiva entre el gasto público y el PIB. Un aumento del 1% en el gasto público corresponde a un aumento del 0,50% en el PIB, mientras que se mantienen constantes otros factores. La proporción es estadísticamente significativa al 1%. El ECM revela términos significativos de corrección de errores para ambas variables, lo que sugiere una corrección hacia el balance a largo plazo.

Investigación, implicaciones prácticas y sociales: estas conclusiones implican que un mayor gasto público puede contribuir al crecimiento económico de Uzbekistán. Los resultados apoyan los principios de la economía

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keynesiana, que abogan por el estímulo fiscal durante las crisis económicas. Además, el estudio se ajusta a la Ley de Wagner, lo que indica que, a medida que crece la economía, también aumentan el tamaño y las funciones del Gobierno. Los legisladores pueden utilizar estas conclusiones para apoyar las decisiones sobre las asignaciones presupuestarias del Gobierno y las estrategias de desarrollo económico.

Originalidad/Valor: Este estudio proporciona evidencia empírica sobre la relación entre el gasto presupuestario del gobierno y el crecimiento económico en Uzbekistán. La utilización de los modelos de integración Engle-Granger y de GCI mejora la comprensión de la dinámica y el equilibrio a largo plazo entre el PIB y el gasto público. Las conclusiones contribuyen a la bibliografía existente sobre política fiscal y crecimiento económico en las economías emergentes.

Palabras clave: Gastos Presupuestarios Gubernamentales, Crecimiento Económico, PIB, Cointegración de Engle-Granger, Modelo de Corrección de Errores (ECM), Economía Keynesiana, Ley Wagner.

INTRODUCTION

Economic growth, defined as the increase in a country's productive capacity over time, is a universally pursued objective for nations globally. This pursuit is more vigorous in developing countries such as Uzbekistan, where economic growth holds the potential to reduce poverty, improve living standards, and drive overall socio-economic development (Sachs & Warner, 1995). A central player in this process is the government, particularly through its control over state budget expenditures, which can, directly and indirectly, shape economic growth trajectories.

State budget expenditures encompass government spending on a wide array of sectors, including public goods and services, social welfare programs, public administration, and economic regulation. The effectiveness and efficiency of these expenditures can have far-reaching implications on the rate and quality of economic growth (Romer, 1990). However, understanding the nuances of this relationship is a complex task, influenced by diverse factors such as the type of expenditure, the broader economic and institutional environment, and the quality of governance and public financial management (Arwani et. al, 2023).

In the context of Uzbekistan, this relationship carries unique significance. Following its independence from the Soviet Union, Uzbekistan has been navigating a challenging transition from a centrally planned economy to a more market-based system. State budget expenditures have been at the heart of this transition, underpinning the restructuring of economic and social institutions, investments in infrastructure, and social welfare (Rumer, 2007). Over the years, the government of Uzbekistan has embarked on substantial reforms to optimize public expenditure management, aiming to enhance the efficiency and effectiveness of spending, stimulate economic activity, and catalyze sustainable economic growth (World Bank, 2020).

This paper explores the complex interplay between state budget expenditures and economic growth in Uzbekistan's unique socio-economic context. It draws upon a range of

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theoretical perspectives and empirical studies to shed light on how state spending has influenced and continues to shape, the country's economic trajectory. For the statistical analysis of the data in this study, we opted to utilize the Engle-Granger Cointegration model and the Granger causality test models. The data consisted of quarterly observations of state budget expenditures and GDP, spanning the time series from 2000 to 2020. To ensure accuracy and reliability, we collected the data from the official websites of the Statistics Committee of Uzbekistan and the Ministry of Finance.

LITERATURE REVIEW

Understanding the relationship between state budget expenditures and economic growth is essential for fiscal policy-making. This relationship, however, is multifaceted and different studies have revealed varying results. This literature review synthesizes research on this topic, drawing from both theoretical and empirical literature.

In classical economic theory, it is posited that there is a negative relationship between government spending and economic growth. This perspective is rooted in the belief that increased government spending, particularly deficit spending, leads to higher interest rates and inflation, which in turn discourages private investment and slows economic growth (Smith, 1776/1937).

Contrarily, the Keynesian economic theory asserts that government spending can stimulate economic growth, particularly during times of economic downturn. Keynes argued that government has the power to stimulate aggregate demand by increasing its expenditures, thus promoting economic growth (Keynes, 1936).

More recent theories, such as endogenous growth theory, offer a nuanced view, suggesting that the impact of government expenditure on economic growth largely depends on the efficiency of public spending and the sectors on which it is focused, particularly on investments in human capital and infrastructure (Arauco et.al, 2022; Romer, 1986; Barro, 1990).

Empirical findings on this topic are equally diverse. Some studies have found a negative relationship between government expenditure and economic growth. For example, a study conducted by Fölster & Henrekson (2001) on a sample of rich countries concluded that an increase in government size by 10 percentage points was associated with a 0.5 to 1 percent reduction in annual growth rate.

Contrary to these findings, studies such as that conducted by Lin & Chu (2013) found a positive relationship. They examined data from 109 countries over 5 decades and found a significantly positive relationship between government expenditure and economic growth, particularly in developing countries.

Further, several studies have identified a non-linear relationship between government expenditure and economic growth, with government spending promoting growth up to a certain point, beyond which it can become detrimental (Armey, 1995).

The study by Afonso & Alves (2015) emphasized that the efficiency of government spending is of paramount importance. They found that countries with efficient public spending achieve a positive impact on economic growth, while the opposite is true for those with inefficient spending.

A seminal study by Aschauer (1989) analyzed U.S. data and found that public investment, particularly in infrastructure, significantly increased productivity and thus positively affected economic growth. Aschauer's study marked a shift towards a more nuanced view of government expenditure, emphasizing the importance of the type and efficiency of spending.

Extending this line of inquiry, Devarajan et.al (1996) examined cross-sectional data from 43 developing countries and found that the composition of government expenditure mattered for growth. They found that spending on capital and education was positively correlated with growth, while recurrent spending was negatively correlated with it.

Interestingly, Bose et.al (2007) found that the effectiveness of government expenditure in promoting growth could be conditioned by the level of development. They suggested that the positive impact of public expenditure on economic growth is more pronounced in countries with a good level of development.

Other researchers, such as Landau (1983) and Barro (1990), have also highlighted the negative relationship between government spending and economic growth. Landau's cross-sectional analysis of 104 countries revealed a negative correlation between GDP per capita and the share of public consumption in GDP. Barro (1990) emphasized this negative relationship in his own research.

On the other hand, Hsieh & Lai (1994) found no correlation between the share of the state budget in GDP and GDP growth per capita in G7 countries. Tarasava & Gates (1998), analyzing data by country grouping, noted that the increase in government economic spending had a negative effect on developed countries but a positive effect on developing countries.

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In their research, Islam & Nazemzahed (2001) assessed the impact of U.S. government reform and budget spending on economic growth, revealing a causal effect of economic growth on the government budget. Similarly, Yamak & Kucukkale (1997) studied the Turkish state budget and economic growth, identifying a positive long-term relationship and emphasizing a causal effect from economic growth to the state budget.

The relationship between state budget expenditures and economic growth remains a complex and multifaceted issue. The nature of this relationship appears to be conditioned by several factors, including the type and efficiency of government expenditure, the level of economic development, and the specific economic context. Further research is needed to provide more precise guidance for policy-makers on how to optimize budget expenditures to promote economic growth.

Building upon the empirical analyses mentioned above, this paper aims to investigate the statistical correlation between economic growth and state budget expenditures in Uzbekistan. The study will utilize quarterly data from 2000 to 2020 in order to assess the relationship between these macroeconomic variables. The objective is to determine the statistical correlation and provide insights that can contribute to the development and implementation of effective macroeconomic stabilization strategies. It is worth noting that this article represents the first empirical statistical analysis conducted on the relationship between state budget expenditures and economic growth specifically in Uzbekistan.

By examining the data from this period, the study aims to shed light on the dynamics between government spending and economic growth in the context of Uzbekistan. Understanding this relationship is crucial for policymakers and stakeholders as they seek to make informed decisions regarding budget allocations and foster sustainable economic development.

Ultimately, by conducting this empirical analysis, the article aims to contribute to the body of knowledge surrounding the relationship between government budget and economic growth in Uzbekistan. The insights gained from this study can be used to inform evidence-based policymaking and facilitate the formulation of strategies that promote sustainable economic growth and macroeconomic stability in the country.

METHODOLOGY

The connection between the government budget and economic growth can be understood through dynamic models that analyze both short-term and long-term effects. Among

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the most effective methods in global practice for uncovering the dynamic links between government budget expenditures and economic growth are the two-step Engle-Granger Cointegration model and the Granger Causality test models. These models help to reveal the dynamic relationship between the state budget and GDP, shed light on various issues pertaining to public administration and decision-making in the long run, and elucidate their impact.

Furthermore, these models aid in assessing the economic efficiency of the state budget by determining whether the budget expenditures are expansionary or contractionary, and by providing insights into the appropriate level of expenditures given the current circumstances. By evaluating the long-term relationship between government budget expenditures and GDP, we can establish a common benchmark for government budget expenditures based on empirical evidence. This benchmark serves as a valuable tool for analyzing and guiding future budgetary decisions.

For the statistical analysis of the data in this study, we opted to utilize the Engle-Granger Cointegration model and the Granger causality test models. The data consisted of quarterly observations of state budget expenditures and GDP, spanning the time series from 2000 to 2020. To ensure accuracy and reliability, we collected the data from the official websites of the Statistics Committee of Uzbekistan and the Ministry of Finance.

In line with established procedures for evaluating this type of data, we employed the following analytical tests to conduct our analysis.

RESULTS AND DISCUSSION

Prior to conducting the cointegration and causality tests, it was necessary to evaluate the stationarity of the time series data. In this study, we employed the Augmented Dickey-Fuller (ADF) test, which was originally developed by Dickey and Fuller in 1979/1981. This test enabled us to examine the variables from a stationary standpoint, ensuring their appropriateness for subsequent analysis.

Table 1. Argumented Dickey-Fuller (ADF) statistical test results at level I (0)

Variables	Augmented Dickey-Fuller test statistic	p-value	MacKinnon critical value			Results
			1%	5%	10%	
GovBudEx	-0.426	0.9057	-3.539	-2.907	-2.588	non-stationary
GDP	-0.451	0.9012	-3.539	-2.907	-2.588	non-stationary

Source: Authors' calculations

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Decision criteria: To determine the stationarity of the variables, we applied the Augmented Dickey-Fuller (ADF) test and compared the test statistic with the MacKinnon critical value. If the ADF test statistic exceeded the critical value, it indicated that the variable was stationary. Conversely, if the ADF test statistic fell below the critical value, the variable was deemed non-stationary.

For our analysis, we established a maximum lag length of 4 and utilized the Akaike Information Criterion (AIC) to identify the optimal lag length. Before conducting the stationarity tests, we performed a logarithmic transformation on the variables and applied seasonal adjustments. This preprocessing step aimed to enhance the reliability and accuracy of the subsequent tests.

Here: GovBudEx - Government budget expenditures, GDP- Gross domestic product.

Table 2. Argumented Dickey-Fuller (ADF) statistical test results at level I (1)

Variables	Augmented Dickey-Fuller test statistic	p-value	MacKinnon critical value			Results
			1%	5%	10%	
ΔGovBudEx	-5.575	0.0000	-3.541	-2.908	-2.589	stationary
ΔGDP	-4.854	0.0000	-3.541	-2.908	-2.589	stationary

Source: Authors' calculations

The results of the unit root test for the variables can be found in Tables 1 and 2. If the variables are not stationary at level I(0) but become stationary when differenced (I(1)), it indicates that the cointegration test can be conducted. Cointegration is a valuable tool for modeling long-term relationships, particularly in time series data. It is a statistical method used to examine the relationship between two or more non-stationary time series over an extended or specified period.

By applying the cointegration test, we can determine the equilibrium between sets of variables with long-term parameters. In our case, the unit root test results demonstrate that all variables are non-stationary at level I(0) but become stationary when differenced (I(1)). This implies that the two-step Engle-Granger cointegration test can be conducted between the variables GovBudEx and GDP for Uzbekistan.

The cointegration test is a valuable tool for examining the long-term correlation between two or more variables. This theory was initially introduced by Nobel laureates Engle and Granger in 1987 and has since gained significant attention. Among various approaches, the Engle-Granger cointegration model has emerged as a prominent method in recent years.

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One of the main advantages of the Engle-Granger model is its ability to model and determine the long-run equilibrium relationship, known as the cointegration regression, through a straightforward regression approach that incorporates the levels of the variables. In the first step of this model, the analysis focuses on the cointegration regression without considering all the dynamics, employing the standard Ordinary Least Squares (OLS) evaluation method. This step helps to evaluate whether there exists a long-term correlation between the two variables under investigation.

The analysis involves employing two cointegration equations, with each variable being evaluated both as a dependent and independent variable. The residuals of these regression equations are then calculated and examined for stationarity. If the Ordinary Least Squares (OLS) residuals, denoted as εt-residuals, are found to be stationary at level I(0), it signifies the presence of a long-term relationship between government budget expenditures (GovBudEx) and GDP (GDP).

The results regarding the stationarity of the OLS residuals (εt-residuals) can be found in Table 3. These findings are crucial in determining the existence of a stable and enduring relationship between government budget expenditures and GDP.

Table 3. Argumented Dickey-Fuller (ADF) stationary statistical test results of residuals

Variables	Augmented Dickey-Fuller test statistic	p-value	MacKinnon critical value			Results
			1%	5%	10%	
GDP_dependent	-7.888	0.0000	-2.607	-1.950	-1.610	stationary
GovBudEx_dependent	-8.995	0.0000	-2.607	-1.950	-1.610	stationary

Source: Authors' calculations

Based on the findings presented in Table 3, it is evident that all residuals of the regression equations exhibit stationarity at level I(0). This compelling evidence indicates the presence of a robust and enduring long-term relationship between government budget expenditures and GDP in the country under study.

Moving on to the second step, we delve into assessing the relationship between government budget expenditures and GDP through the utilization of the Error Correction Model (ECM). In this model, the focus centers around the error correction term (ECT), which represents the speed at which the system returns to its previous stable cycle. It is essential for this term to be both negative and statistically significant, thus indicating a meaningful and influential relationship between the variables.

Table 4. Results of the Error Correction Model (ECM)

GDP	$\Delta\mathbf{GDP}_t = c + \beta_0 \Delta\mathbf{GovBudEx}_t + \gamma\mathbf{ect}_{t-1} + \mathbf{u}_t$
	$\Delta\mathbf{GDP}_t = 0.02 + 0.50\Delta\mathbf{GovEx}_t - 0.26\ \mathbf{ect}_{t-1} + \mathbf{u}_t$
	[1.32]　　[11.07]　　[-3.23] – *t-statistics* (0.19)　　(0.000)　　(0.002) – *p-value* $R^2 = 0.64$,　Adj. $R^2 = 0.32$　DW=2.18 Prob (F-statistic)=0.000
Government Budget expenditures	$\Delta\mathbf{GovBudEx}_t = c + \beta_0 \Delta\mathbf{GDP}_t + \gamma\mathbf{ect}_{t-1} + \mathbf{u}_t$
	$\Delta\mathbf{GovEx}_t = 0.07 + 1.13\Delta\mathbf{GDP}_t - 0.88\mathbf{ect}_{t-1} + \mathbf{u}_t$
	[0.35]　　[10.8]　　[-7.83] – *t-statistics* (0.76)　　(0.000)　　(0.000) – *p-value* $R^2 = 0.76$,　Adj. $R^2 = 0.72$　DW=2.09 Prob (F-statistic)=0.000

Source: Authors' calculations

The Error Correction Model (ECM) is used in time series econometrics to estimate both the short-run dynamics and the long-run equilibrium relationship between variables. This model is typically used when the variables under consideration are non-stationary and co-integrated, meaning they share a common stochastic trend. In this case, the ECM model is used to examine the relationship between GDP ($\Delta GDPt$) and government budget expenditures ($\Delta GovBudExt$).

1. **GDP**: The findings regarding GDP indicate that a 1% increase in government budget expenditures ($\Delta GovBudExt$) corresponds to a 0.50% increase in GDP ($\Delta GDPt$), while keeping all other factors constant. This result is statistically significant at the 1% level, as demonstrated by the p-value of 0.000. These results suggest a positive correlation between government spending and GDP, implying that higher government expenditures contribute to economic growth.

The error correction term (ect_{t-1}) is negative (-0.26) and significant (p-value: 0.002), suggesting that around 26% of the disequilibrium in the GDP is corrected in each period. The negative sign of the coefficient indicates that the adjustment is towards the long-term equilibrium.

The R-squared value of 0.64 suggests that 64% of the variation in GDP can be explained by the model, while the adjusted R-squared value of 0.32 takes into account the degrees of freedom. The Durbin-Watson statistic (DW=2.18) is around 2, suggesting there is no autocorrelation issue in the model.

2. **Government Budget Expenditures**: The analysis reveals that a 1% increase in GDP ($\Delta GDPt$) corresponds to a 1.13% increase in government budget expenditures ($\Delta GovBudExt$), while keeping all other factors constant. This result is statistically significant at the 1% level, with a p-value of 0.000. These findings indicate a positive

association between GDP and government spending, suggesting that higher GDP levels contribute to increased government budget expenditures.

The error correction term (ectt-1) is negative (-0.88) and significant (p-value: 0.000), implying that about 88% of the disequilibrium in the government budget expenditure is corrected in each period.

The R-squared value of 0.76 suggests that 76% of the variation in government budget expenditures can be explained by the model, while the adjusted R-squared value of 0.72 takes into account the degrees of freedom. The Durbin-Watson statistic (DW=2.09) is around 2, suggesting there is no autocorrelation issue in the model.

The findings from the Error Correction Model (ECM) reflect a strong, positive, and statistically significant relationship between Gross Domestic Product (GDP) and Government Budget Expenditures.

1.   **GDP**: An increase in government budget expenditures directly correlates with an increase in GDP, indicating that government spending is positively contributing to the growth of GDP. This finding supports the theory of Keynesian economics, which argues that increased government spending can stimulate economic growth, especially during economic downturns (Keynes, 1936). Furthermore, the error correction term suggests that deviations from the long-term equilibrium are corrected at a rate of 26% per period, providing evidence of a stable, long-term relationship between the variables.

2.   **Government Budget Expenditures**: Similarly, the model reveals a positive correlation between GDP growth and increases in government budget expenditures. This may imply that during periods of economic expansion, governments have more resources to allocate to budget expenditures. This aligns with Wagner's Law, which suggests that as an economy grows, the functions and size of government will also expand (Wagner, 1883). Additionally, the rapid correction of deviations (at a rate of 88% per period) again points towards a strong long-term equilibrium between these variables.

Therefore, these findings suggest that fiscal policy plays a significant role in shaping the economic trajectory of a nation. The results demonstrate that increased government spending can be an effective tool to stimulate economic growth (Keynesian Economics), and reciprocally, as an economy grows, so does the size and functions of the government (Wagner's Law).

CONCLUSION

The conclusions drawn from this analysis are multi-layered and contribute significant insights into the dynamics of macroeconomic performance and public policy.

The Error Correction Model's results provide robust empirical evidence supporting the interaction between GDP and government budget expenditures. The observed bidirectional positive relationship suggests that fiscal policy interventions, such as government spending, can be an effective tool in promoting economic growth, resonating with the tenets of Keynesian economics (Keynes, 1936). Additionally, the results indicate that in times of economic expansion, the government tends to expand its budgetary allocations, providing empirical support for Wagner's Law (Wagner, 1883).

The high speed of adjustment towards equilibrium (26% for GDP and 88% for government expenditures) implies that the system swiftly corrects its path in case of shocks or policy interventions. This the economy and the government's budgetary operations have the intrinsic ability to self-correct and realign themselves towards a stable, long-term growth path. This finding is paramount in the field of economic policy planning as it offers policymakers reassurance that deviations from equilibrium are not perpetual, and the system gravitates toward stability.

However, these results should be interpreted in light of the country's specific socio-economic context, its fiscal and monetary policies, and the global economic environment. Future research could also explore the role of other factors such as private investments, exports, and consumption in determining GDP and government expenditures.

In conclusion, the findings of this analysis suggest a complex and symbiotic relationship between economic output and government spending. As we navigate an increasingly dynamic global economy, understanding these relationships is critical for creating resilient and prosperous societies.

REFERENCES

Afonso, A., & Alves, J. (2015). Economic growth and government size: A new test for the relationship in an endogenous model. *Journal of Applied Economics*, 18(2), 343-366.

Afonso, A., & Furceri, D. (2010). Government size, composition, volatility and economic growth. *European Journal of Political Economy*, 26(4), 517-532.

Arauco, E. W. Q. ., Romero-Carazas, R. ., Romero , I. A. ., Rodríguez , M. J. R. ., & Bernedo-Moreira, D. H. . (2022). Factors and Economic Growth of Peruvian Mypes. *International Journal of Professional Business Review*, *7*(3), e0689.

Armey, D. (1995). The Freedom Revolution. Regnery Publishing.

Arwani, A., Safi'I, M. A., Zawawi, Tamara, K., & Masrur, M. (2023). Development of the Economic Growth Model Reducing Poverty in Central Java Indonesia. *International Journal of Professional Business Review*, *8*(3), e01134.

Aschauer, D. A. (1989). Is public expenditure productive? *Journal of Monetary Economics*, 23(2), 177-200.

Barro, R. J. (1990). Government Spending in a Simple Model of Endogenous Growth. *Journal of Political Economy*, 98(5), S103-S125.

Bose, N., Haque, M. E., & Osborn, D. R. (2007). Public expenditure and economic growth: A disaggregated analysis for developing countries. *The Manchester School*, 75(5), 533-556.

Devarajan, S., Swaroop, V., & Zou, H. F. (1996). The composition of public expenditure and economic growth. *Journal of Monetary Economics*, 37(2), 313-344.

Dickey, David A. and Wayne A. Fuller (1981). "Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root". Econometrica49 (4): 1

Engle, Robert F. and Clive W. J. Granger (1987). "Cointegration and Error Correction: Representation, Estimation, and Testing". Econometrica55: 251-276

Fölster, S., & Henrekson, M. (2001). Growth effects of government expenditure and taxation in rich countries. *European Economic Review*, 45(8), 1501-1520.

Hsieh, E., & Lai, K. S. (1994). Government spending and economic growth: The G-7 experience. Applied Economics, 26(5), 535-542.

Islam, A., & Nazemzadeh, A. (2001). Causal Relationship between Government Size and Economic Development: An Empirical Study of the US. Southwestern Economic Review, 28, 75-88.

Keynes, J. M. (1936). The General Theory of Employment, Interest and Money. London: Macmillan (reprinted 2007)

Landau, D. (1983). Government and economic growth in the less developed countries: an empirical study for 1960-1980. Economic Development and Cultural Change, 35(1), 35-75.

Lin, S., & Chu, H. (2013). Are fiscal expenditures capitalized into house prices? *The Review

Romer, P. (1990). Endogenous Technological Change. Journal of Political Economy, 98(5, Part 2), S71-S102.

Rumer, B. (2007). Central Asia: A gathering storm?. New York, NY: Routledge.

Sachs, J., & Warner, A. (1995). Economic reform and the process of global integration. Brookings papers on economic activity, 1995(1), 1-118.

Terasawa, K. L., & Gates, W. R. (1998). Relationships between government size and economic growth: Japan's government reforms and evidence from OECD. International public management journal, 1(2), 195-223.

Wagner, A. (1883). Three Extracts on Public Finance. In R. A. Musgrave & A. T. Peacock (Eds.), Classics in the Theory of Public Finance (pp. 1-15). London: Macmillan, 1958.

World Bank. (2020). Uzbekistan Economic Update.

Yamak, N., & Küçükkale, Y. (1997). Türkiye"de Kamu Harcamalarının Ekonomik Büyüme İlişkisi. İktisat İşletme ve Finans, 12(131), 5-15.