sciendo

Research Article

Assessing the impact of inflation and unemployment on economic growth in Albania

PhD (C.) Volfrida Toma
University "Luigj Gurakuqi", Shkodër, Albania

DOI: https://doi.org/10.2478/bjir-2024-0016

Abstract

This manuscript aims to perform an in-depth analysis of the intricate relationship between inflation, unemployment, and economic growth within the Albanian economy. By employing advanced regression analysis techniques and thoroughly measuring the correlation between these key economic variables, this study endeavors to shed light on the underlying dynamics that characterize the economic landscape of Albania. Focusing particularly on the most recent period, the research seeks to provide a significant contribution to the existing body of knowledge regarding the country's economic fluctuations and trends. The study meticulously synthesizes the findings from the regression analysis to offer insightful conclusions that elucidate the complex interactions between inflation, unemployment, and economic growth in Albania. The utilization of regression analysis and correlation metrics is expected to yield precise and detailed insights into these economic phenomena, thereby enhancing the understanding of how these variables influence each other. This research holds the potential to offer valuable recommendations for policymakers, economists, and stakeholders involved in shaping the economic policies of Albania. Ultimately, the study aims to contribute to a more nuanced comprehension of the economic dynamics within Albania and the multifaceted relationship between inflation, unemployment, and economic growth.

Keywords: Inflation, unemployment, economic growth, regression analysis, correlation.

1. Introduction

Albania, in comparison with neighboring countries, shows a positive trend in employment growth. The World Bank's report on the labor market in the Western Balkans and the Vienna Institute for International Economic Studies indicate that unemployment in the Western Balkans has decreased significantly over recent years. According to INSTAT (Albanian Institute of Statistics) data, the official unemployment rate in Albania for the population over 15 years old was recorded at 11.4%. This decline in unemployment is a positive indicator of economic recovery and growth. Economic growth in Albania has been primarily driven by foreign investments,

which have played a crucial role in the development of various sectors. However, the levels of foreign direct investment have fluctuated over the years, reflecting the broader economic conditions and investor confidence. Despite these fluctuations, the levels of foreign investments remain generally low compared to regional standards. This highlights the need for Albania to adopt more effective policies to attract and sustain higher levels of foreign investments.

Albania is in many ways well-positioned to attract substantial foreign investments. The country's strategic location with access to Adriatic ports, a well-trained and competitive labor force, attractive wage levels, and abundant natural resources make it an appealing destination for investors. These factors, combined with a favorable business environment, can significantly boost economic growth and employment.

However, economic growth in Albania over the past decade has presented a conservative reality when compared to the potential growth rates. The real percentage of economic growth has often fallen short of its potential, reflecting structural challenges and policy inefficiencies. Since the transition to a market economy in 1991, Albania has made remarkable progress, with income levels and capital investments significantly higher than before the transition. Despite this progress, there is still considerable room for improvement.

In the context of a developing economy like Albania, the relationship between inflation, unemployment, and economic growth is particularly significant for economic policies and overall stability. Understanding this relationship is crucial for policymakers, economists, and stakeholders who aim to foster sustainable economic development. Regression analysis and correlation are powerful statistical tools that help in understanding how changes in one economic variable can influence others.

The use of regression analysis in this study will enable a detailed examination of the impacts of inflation and unemployment on economic growth. By identifying the key relationships between these variables, the study aims to provide a clear and comprehensive approach to understanding economic dynamics. The findings from this analysis can offer valuable insights for policymakers in crafting effective economic policies that promote stability and growth.

Moreover, the use of sophisticated statistical methods, such as regression analysis and correlation, ensures that the study is grounded in rigorous scientific analysis. These methods allow for accurate predictions of the possible impacts of changes in inflation, unemployment, and economic growth. Such predictions are essential for the formulation of long-term economic policies and strategic planning.

The results of this study are expected to serve as a valuable resource for the development and enhancement of economic policies in Albania. By utilizing real-time and comprehensive data on inflation, unemployment, and economic growth, the study aims to build a rich database that can support future research and policy development. This database can be an important reference for other researchers and policymakers interested in similar economic studies.

In conclusion, this study seeks to deepen the understanding of the intricate relationships between inflation, unemployment, and economic growth in Albania.

Through rigorous analysis and the use of advanced statistical techniques, the study aims to contribute to the formulation of effective economic policies that enhance Albania's economic stability and growth prospects.

2. Materials and Methods

Significant efforts in scientific research have been devoted to discovering cause-and-effect relationships among phenomena. In the context of statistical science, this process of uncovering these deterministic models is explained through association (contingency). Such a discovery is highly useful for producing a predictive model that can be used to predict one variable if the other is known. Forecasting the future development of GDP growth and inflation is a central concern in economics. Forecasts are usually produced either by models based on economic theory or by simple linear time series models. While a time series model can provide a reasonable benchmark for assessing the added value of economic theory, recent developments in time series analysis suggest that more advanced time series models may offer more serious benchmarks for economic models (Stock & Watson, 2017).

According to Dumitrescu and Săvoiu (2016), who conducted their study in Romania, there is a significant correlation between inflation and the gross income of the population, which necessitates the development of a "General Index of Inflation" (GII) to improve inflation measurement and analysis. The authors argue that higher inflation reduces the purchasing power of gross income, underscoring the need for a more accurate evaluation of inflation. They propose the GII and spatially disaggregated indices as tools to better adapt to economic changes and enhance inflation-related forecasts. This approach responds to the challenges posed by recent recessions and potential future inflationary pressures (Dumitrescu & Savoiu, 2020)"properties":{"fo rmattedCitation":"(Dumitrescu & Savoiu, 2020.

Yelwa, Okoroafor, and Awe (2015), conducted their study in Nigeria, there is a significant relationship between unemployment, inflation, and economic growth. Utilizing secondary data from 1987 to 2012, the study employs ordinary least squares methodology to analyze these relationships. The findings reveal that in the long run, interest rates and total public expenditure significantly impact economic growth, while inflation and unemployment have inverse effects on growth. The inverse effect of inflation is attributed to supply chain disruptions rather than aggregate demand pressures. The study also indicates significant feedback from long-run to short-run disequilibrium and a causal linkage between inflation, unemployment, and economic growth. The authors recommend that the government should fine-tune macroeconomic policies to create a sustainable environment that enhances domestic output (Yelwa et al., 2015)inflation and economic growth in Nigeria: 1987-2012. The study utilizes secondary data to analyze the relationship between unemployment, inflation and economic growth. The methodology used for the study was ordinary least squares. The results confirms that in the long run, interest rate and total public expenditure have significant impact on economic growth in Nigeria, while inflation and

unemployment has inverse effects on growth in Nigeria. The possible justification for the inverse effect of inflation on price level is that inflation may not be due to aggregate demand pressure but rather due to hiccups in the supply chain of goods both from the domestic and foreign supply outlets. Empirical deductions also signify the presence of significant feedback from the long run to short run disequilibrium. However, there exists a causal linkage between inflation, unemployment and economic growth in Nigeria. In conclusion, the paper recommended that the government must as a matter of necessity to improve or continue to fine-tune macroeconomic policy instruments to achieve a sustainable and enable environment that will enhance increase in domestic output.","container-title":"Applied Economics and Finance","DOI":"10.11114/aef.v2i3.943","ISSN":"2332-7308, 2332-7294","issue":"3","journalAbbreviation":"AEF", "language":"en","page":"102-109","source":"DOI.org (Crossref.

In their research, Chu, Cozzi, Fan, and Furukawa (2020) found that the relationship between inflation and unemployment varies depending on the type of cash-in-advance (CIA) constraint applied. When the CIA constraint is on research and development (R&D), higher inflation reduces innovation and increases unemployment. Conversely, when the CIA constraint is on consumption, higher inflation also reduces innovation but decreases unemployment. These findings are supported by empirical data and offer an explanation for the mixed results observed in existing literature. The study calibrates the model using aggregate data from the United States and the Eurozone to quantitatively analyze this relationship (Chu et al., 2021).

In their study, Ramzan (2021) investigates the impact of inflation and unemployment on Pakistan's economic growth. Using data from 1980 to 2018 and employing the Ordinary Least Squares (OLS) method, the study assesses the relationship between these variables. The findings suggest that inflation and unemployment do not significantly impact economic growth in Pakistan. The econometric results indicate that the time series data is stationary, with significant values in error terms ensuring a long-term association. However, the multiple linear regression models show that both inflation and unemployment are statistically insignificant in relation to economic growth. The study also finds no issues of multicollinearity or heteroscedasticity but concludes that the model is not specified correctly based on the Ramsay RESET test (Ramzan, 2021)the "Ordinary Least Square (OLS.

According to Sahnoun and Abdennadher (2019), their study explores the relationship between unemployment, economic growth, and inflation in North African countries from 1965 to 2016 using the vector error-correction model. The analysis, which includes unit root tests (Dickey–Fuller and Phillips–Perron) and the Johansen co-integration test, finds a unidirectional causality from inflation to economic growth, from economic growth to unemployment, and from inflation to unemployment. The study offers economic implications based on these causal relationships (Sahnoun & Abdennadher, 2019).

In many business situations, observing the dependence between variables is important. For example, it is logical to assume that the sale of a product is correlated with its price and advertising expenses. In decision-making, it is very important

to identify whether there is linear dependence between two variables, and if this dependence exists, to determine its "strength." The quantitative expression of the form and degree of relationships between phenomena is presented through regression and correlation. Here, two possible models are discussed, which allow the determination of a relationship between two or more different magnitudes. Dependence can be identified using a scatter diagram, and the "strength" can be determined through the statistical measure called the correlation coefficient. Correlation deals only with the strength of the relationships between two variables; it does not show the causes of the relationship. Therefore, the numerical expression that presents the degree and intensity of relationships between phenomena is called the correlation coefficient. Relationships between two phenomena cannot be explained solely by two factors; they are multidimensional and more complex. Hence, for a more complex expression of the interrelationships and ratios of a phenomenon with a group of other phenomena, multivariable correlation is used. Correlation analysis is a mathematical technique that serves to measure the "strength of dependence" between two variables. The correlation coefficient is denoted by "r" and takes values between -1 and +1. Knowing the values of variables in different processes would be very useful, especially when their values change. Regression investigates the impact of the change in the value of the independent variable on the value of the dependent variable. Therefore, depending on the examination of one-dimensional, two-dimensional, or multidimensional relationships, the models of interrelations between the main factors that act in the development of different phenomena in nature and society are determined. Regression represents the average quantitative relationship between two or more massive phenomena, specifically it presents that mathematical function which expresses the average relationship of two or more observed phenomena, which relates to the expression of the form of the development of two or more events. Thus, the meaning of the word regression derives from the word "regress," which implies examining an event in the past. Regression analysis is most often used in the investigation of the variability of two phenomena, one of which is presented as an independent variable while the other is a dependent variable. Empirical data presented as two-dimensional data best aid in finding their reciprocal relationship or impact.

The presentation of the linear regression model is done through the linear function. $y = a + bx$. In this case:

- x – is the dependent variable;
- y – is the independent variable.

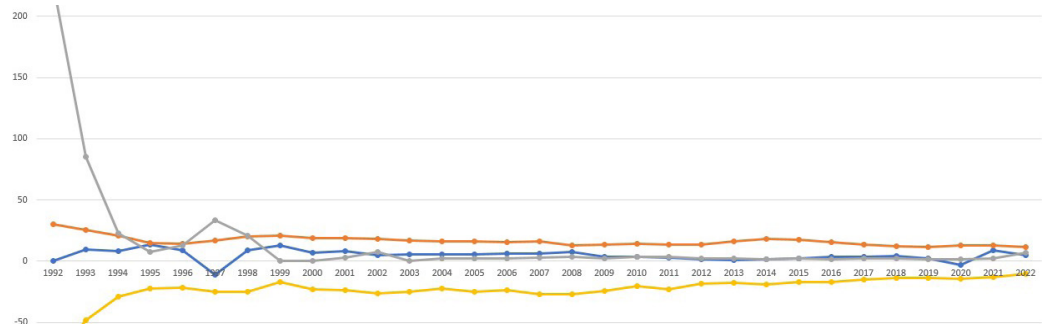
Linear functions in the coordinate system represent lines. Linear equations are presented through the deterministic model and the parabolic model, which is more commonly used in real life.

To analyze the relationship between inflation, unemployment, and economic growth, this study uses the regression line. For this purpose, we will use the time series data of these three variables over a specific period, including the monthly or annual data of each. We will also measure the correlation between these variables to uncover

possible interactions.
The analysis begins with an examination of inflation in Albania, identifying possible causes of the overall price increase. Through the regression line, we aim to determine the impact of inflation on other economic variables.
The study will then analyze unemployment and the labor market in Albania. Through the regression line, we will attempt to understand how the unemployment rate affects economic growth and inflation. In this context, the correlation will help us observe where the strongest connection between these variables occurs.
The use of the regression line will allow us to identify the main factors contributing to economic growth.

3. Results and Discussion

Figure 1. The evolution of four macroeconomic indicators in Albania, for the period 1992-2022



Source: Tradingeconomics.com/INSTAT

The real economic growth rate is measured by the growth of the gross domestic product (GDP) from one year to the next in real terms. As the most important indicator of economic health, it also shows how quickly an economy is growing. The period under study shows an increase in GDP followed by a decline during the pandemic, indicating that the economy was not doing well, leading to a contraction in economic growth.
The unemployment rate is always fluctuating, exhibiting an unpredictable trend behavior. It is high throughout the years, given that Albania is a small-population country. The peak period is during the global crisis years, continuing to decline in the following years. Here, a correlation between GDP and unemployment is again seen. During the decade under study, the graph of Albanian GDP shows that it reaches high values. Meanwhile, in this graph, unemployment reaches low values. This is an indicator of a negative relationship between these two variables.
The Albanian consumer price index is increasing over time. Changes in the price levels of the consumer basket of goods and services are constantly rising. One of the most important macroeconomic indicators is the interest rate. In Albania, it shows a downward trend due to the monetary policies that the Bank of Albania has implemented over the years, lowering the interest rate year after year.

To better understand the relationship between economic growth, inflation, and the unemployment rate, we analyzed the time series for the entire period from 1992 to 2022.

Table 1: Descriptive Statistics of Unemployment and GDP

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Unemployment	31	16.38526	4.009573	11.47	30.015
GDP	31	4.494319	5.058822	-10.92	13.32233

Source: Author

The number of observations is 31, with an average unemployment rate of 16, a standard deviation of 4, while the minimum value of the unemployment rate is 15, and the maximum is 30. The average GDP growth rate is 5, with a standard deviation of 5, while the minimum GDP value is -10.92, and the maximum is 13.3.

4. Model Evaluation

Using the statistical technique of regression analysis in Gretl, we obtain the following results with the Ordinary Least Squares (OLS) model for the years 1992-2022, a model developed in the USA. The OLS method provides an unbiased estimate of the minimum variance when errors have finite variances. The smaller the variances, the better the model fits the data.

Table 2: Regression Analysis of Economic Factors

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	−5.54603	4.91133	−1.129	0.2684	
UnemploymentRat	0.700871	0.316233	2.216	0.0350	**
InflationRate	−0.0958505	0.0299568	−3.200	0.0034	***

Model 1: OLS, using observations 1992-2022 (T = 31)
Dependent variable: GrowthRateofGDP

Mean dependent var	4.494319	S.D. dependent var	5.058822
Sum squared resid	560.3081	S.E. of regression	4.473366
R-squared	0.270195	Adjusted R-squared	0.218066
F(2, 28)	5.183207	P-value(F)	0.012159
Log-likelihood	−88.85184	Akaike criterion	183.7037
Schwarz criterion	188.0056	Hannan-Quinn	185.1060
rho	0.004428	Durbin-Watson	1.975839

Source: Author

$$\hat{Y}_i = \beta 1 + \beta 2\ Inflation_i + \beta 3\ Unemployment$$

$$GDPi = -5.54603 - 0.0958505\ Inflation + 0.700871\ Unemployment$$

· An increase of 1% in the inflation rate will result in a decrease of 0.0958505 in the GDP rate, assuming the other variable remains constant.
· An increase of 1% in the unemployment rate will result in an increase of 0.700871 in the GDP rate, assuming the other variable remains constant.
Next, we will graphically present the relationship between these two variables using a scatter plot. For this analysis, we will use the method of simple linear regression between the two variables. GDP is a measure of economic growth within a country or state.
The results of the simple linear regression analysis can be seen in the following graph. This graph includes two variables, one of which is dependent and the other is independent.
Figure 2. Correlation between the unemployment rate and GDP growth rate in Albania, for the period 1992-2022.

Table 3: Model Summary Statistics

Multiple R	0.764923068
R Square	0.5851073
Adjusted R Square	0.570800655
Standard Error	2.626804012
Observations	31

ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	282.1974358	282.1974	40.89759	5.41996E-07
Residual	29	200.1028802	6.900099		
Total	30	482.3003159			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	15.29391967	0.501702946	30.48401	1.4E-23	14.26782193	16.32002	14.26782	16.32002
X Variable 1	0.072461093	0.011330681	6.395122	5.42E-07	0.049287248	0.095635	0.049287	0.095635

Source: Author
In this case, where R is 0.764923, it indicates a relatively strong positive correlation between the unemployment rate and the inflation rate. The positive sign shows that when one variable (unemployment rate) increases, the other variable (inflation rate) tends to increase as well, and vice versa. The magnitude of 0.76 indicates a strong correlation, meaning there is a significant relationship between changes in the unemployment rate and changes in the inflation rate. In simpler terms, when unemployment rises, inflation tends to rise, and when unemployment falls, inflation

tends to fall, with a relatively strong connection between them.

5. Conclusions

Correlation between the Unemployment Rate and Economic Growth (R = -0.05): The correlation coefficient of -0.05 indicates a very weak negative relationship between the unemployment rate and economic growth. This means that there is only a slight inverse association between these two variables. Specifically, as the unemployment rate rises, there might be a minor tendency for economic growth to slow down, and similarly, when unemployment decreases, economic growth may experience a slight uptick. However, the correlation is so weak that it suggests the relationship between changes in unemployment and economic growth is not substantial or significant. In practical terms, fluctuations in the unemployment rate do not have a strong, predictable effect on economic growth, and vice versa.

Correlation between the Unemployment Rate and the Inflation Rate (R = 0.76): The correlation coefficient of 0.76 reveals a relatively strong positive relationship between the unemployment rate and the inflation rate. This indicates that there is a significant direct association between these two variables. When the unemployment rate increases, there is a notable tendency for the inflation rate to also rise, and similarly, when unemployment decreases, inflation tends to fall. The magnitude of 0.76, which is relatively close to one, underscores a robust connection between changes in the unemployment rate and fluctuations in the inflation rate. In simpler terms, the data suggests that the unemployment rate and inflation rate are closely linked, with each rising or falling in tandem.

Evaluation of Macroeconomic Policies**:** The macroeconomic policies implemented during the period under analysis have not been effective in improving employment outcomes. The study's findings show a lack of significant correlation with the economic indicators of interest, reflecting inadequate performance in enhancing employment levels. The reliability of this study is influenced by the quality of the data analyzed. In Albania, the transition from a communist system has led to concerns about the accuracy of statistical data, not just among local economic agents but also among credible international organizations. This issue is compounded by the fact that statistics from INSTAT do not encompass the informal economy or illegal employment, further affecting data reliability.

Recommendations**:** To address these issues, it is recommended that policymakers design and implement strategies that integrate all three key macroeconomic indicators—unemployment, economic growth, and inflation—into a cohesive framework. Additionally, the government should enhance security for unemployed individuals by increasing the flexibility of firms to hire and providing appropriate permissions for this demographic. Following Keynesian economic theory, policies should focus on boosting household consumption and investing in firms to reduce taxes, which could lead to increased production and, in turn, higher employment levels. However, the Albanian economy's heavy reliance on imports, along with

prevailing neoclassical economic views, complicates this approach. Neoclassical theory suggests that reducing labor costs by lowering social and health contributions and limiting wage increases might be more effective, given the low-cost production of goods and services from countries like China.

Acknowledgment

The researcher would like to thank University "Luigj Gurakuqi" of Shkoder for covering the publication costs.

References

Chu, A. C., Cozzi, G., Fan, H., & Furukawa, Y. (2021). Inflation, Unemployment, and Economic Growth in a Schumpeterian Economy. *The Scandinavian Journal of Economics*, *123*(3), 874–909. https://doi.org/10.1111/sjoe.12416

Dumitrescu, V., & Savoiu, G. (2020). Major issues of statistical quantification of current inflation in accordance with Romania's total gross revenues of population -The necessity for a 'general index of inflation' (GII). *Revista De Statistica*, *2016*, 14–24.

Ramzan, M. (2021). Impact of Inflation and Unemployment on Economic Growth of Pakistan. *European Journal of Business and Management Research*, *6*(4), Article 4. https://doi.org/10.24018/ejbmr.2021.6.4.993

Sahnoun, M., & Abdennadher, C. (2019). Causality Between Inflation, Economic Growth and Unemployment in North African Countries. *Economic Growth*, *1*.

Yelwa, M., David, O. O. K., & Omoniyi, A., Emmanuel. (2015). Analysis of the Relationship between Inflation, Unemployment and Economic Growth in Nigeria: 1987-2012. *Applied Economics and Finance*, *2*(3), 102–109. https://doi.org/10.11114/aef.v2i3.943