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The Role of Economic Prognoses in the Modelling of Fiscal and Monetary Levies of the Albanian Economy

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ABSTRACT

The purpose of the research was to demonstrate possible options for the development of the Albanian economy in 2023 and to provide some advice for monetary policy in the country. The main methods used in the research were modelling, formalisation, historical and some others. The authors forecast that the Albanian economy will decelerate in 2023, based on an analysis of some key macroeconomic factors. Thus, the research forecasts the country's GDP level based on quarterly data for the last 12 years and develops a factor analysis of the country's development over the last two years using time series analysis. The main factors considered for this forecast are the inflation rate, changes in benchmark interest rates, and the level of public and private investment in the Albanian economy. Thus, this research provides new knowledge for the National Bank of Albania to develop its monetary policy based on the interest rate, inflation and public investment in the next year's budget.

HIGHLIGHTS

⊙ This research develops a model for predicting the progress of the Albanian economy in the post-COVID-19 pandemic context and during the crisis due to Russia's full-scale invasion of Ukraine.

Keywords: Macroeconomics, regression model, monetary policy, economic development, crisis management

Currently, the world is in a state of crisis, and the global economy is in a rather difficult state (Caldara *et al.* 2022). The main reasons for this are the rise in raw material prices due to the beginning of the full-scale invasion of Ukraine and the economic consequences of the pandemic, which are still being experienced (Umar *et al.* 2022; Sokhanvar and Bouri, 2023). In addition, after huge liquidity injections in previous years and a prolonged period of low-interest rates, central banks are no longer able to increase the supply of money as they must fight inflation and reduce demand for currency (Stiglitz and Regmi, 2022; El-Chaarani *et al.* 2023). The main tool for solving this problem is to raise the basic interest rate, but the complexity of the situation is that such a policy is harmful to the economy, as it

reduces consumption and stimulates the growth of resource prices (Zermeno *et al.* 2018). Such adverse effects could not but affect Albania, where more than 50% of economic activity is determined by imports (Dragusha and Ulqinaku, 2022; Trade Map, 2023). Therefore, it remains relevant to consider the development of the budget and tax policy for the period 2023-2024 for it, considering all the above-mentioned crisis phenomena.

S. Estrin and M. Uvalic (2014) described the importance of factors influencing economic growth

using a gravity model for transition economies. They demonstrated that the Western Balkans receive relatively less foreign direct investment (FDI) compared to transition countries, considering the size of the economy, geographical location and level of institutional development. In the study by K. Mersini *et al.* (2022) assessed the effectiveness of measures taken by the state since the beginning of the pandemic COVID-19, namely lockdown and support for households and small businesses. S. Hobbs *et al.* (2021) explored the impact of foreign investment and foreign trade on a country's economic growth, although they paid little attention to other factors. This factor was analysed by M. Hoxhaj and I. Pulaj (2022) and used to develop a regression-correlation model of the country's GDP change. However, in the author's opinion, the development of such dependencies by analysing the impact of only one factor is not correct, as it does not allow evaluating the full range of impact on the country's economic development. Thus, the main purpose of the research was to propose a multiple regression model that would include some of the main factors that could help forecast GDP in future periods. The main ones were an investment, inflation and the interest rate. It will allow for a more accurate assessment of the country's development prospects, and thus a more effective state budget.

MATERIALS AND METHODS

The multiple linear regression model is used to identify the relationship between GDP and some factors that are considered relevant for the Albanian economy. This model allows for extensive analysis and interpretation of data to provide forecasts and recommendations at the country level. In this case, inflation, investment and the interest rate are used as independent variables, and GDP is the dependent variable. The analysis is based on trimesters from 2010 to 2022. The statistics were obtained from INSTAT (2022) and Bank of Albania (2022) databases.

Based on the regression coefficients obtained in the course of the research, the author has developed a multiple linear regression model. Its general appearance is as follows:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \varepsilon \qquad \ldots(1)$$

where: Y – dependent variable (in this case, GDP); x_i – independent variables (inflation, investment, interest rate); β_0 – constant; ε – error due to the influence of other 6% factors on the dependent variable.

The dependent variable in this research is GDP. In research was analysed the financial level of public and private investment in the Albanian economy by a quarter since 2010. The research analyses the key interest rate according to the definition of the Bank of Albania (2022) and the indicators it publishes for it. The Bank of Albania publishes interbank money market rates – Tribid and Tribor. They represent the average interest rates charged by second-tier banks for accepting and placing deposits in the interbank money market. The last indicator is inflation, which is an estimate of changes in the average price level (or depreciation of the national currency) for goods and services classified according to their consumption patterns.

The main approach used in the research was a systematic one. It allowed the establishment of a unified structure of the dependent and independent variables' influence on each other, describing them as separate processes that influence each other. Modelling became the main research method during the work. It allowed evaluating of the correlations and determining their essence between the dependent and independent components described above. The method of formalisation was essential, as it allowed simplifying the system for more accurate construction, better understanding and better subsequent evaluation. Statistical research methods were used to develop their quantitative assessment. In particular, correlation and regression modelling was most actively used. In addition, the historical method was used to assess the current state of the Albanian economy, considering past events.

RESULTS

In general, economic development and GDP growth, in particular, can vary depending on many factors. Within the framework of the same study, the author selected three main variables, namely inflation, interest rate and investment level, but this does not mean that they are universal and unified. Thus, using different indicators or more

of them is more than acceptable in future research. After 2021, the main element that most researchers, international economic institutions, and central banks pay attention to is the level of liquidity of each country. The tendency in recent years to inject liquidity into the system has resulted in excessive amounts, and they are now trying to withdraw this liquidity. Since Alan Greenspan headed the Federal Reserve, the world has become accustomed to extremely low-interest rates and a surplus of liquidity (World Bank, 2022). The return to a more "normal" monetary regime has side effects, which could be quite challenging for the global economy.

As for the investment attractiveness of Albania, Standard & Poor's (S&P) affirms Albania's "B+" rating, which indicates a very positive and "stable" outlook for its development. The agency predicts that Albania's GDP growth will slow to 2.2% in 2023 from an estimated 3.2% this year, before recovering to an average of 3.4% in 2024-2025, demonstrating resilience to possible global crises and a decline in demand in Europe. In addition, S&P forecasts Albania's budget deficit to shrink to 3.7% of GDP in 2022, before improving to 2.9% by the end of 2025. As mentioned above, several regression models were analysed using the latest version of the IBM SPSS software package (Table 1).

In addition, notably, the strong correlation between investment and interest rates, and the weak correlation with inflation. Notably, the author used the Enter method, in which all independent variables are included in the model without any restrictions. In the Regression component, the Sum of squares is 139,580,925,314.745, and the degrees of freedom (df) is 3. The Middle square is 46,526,975,104.915. The F-value is 241.441, and the Significance coefficient is denoted as 000b, indicating a significant relationship between the variables. In the Balance component, the Sum of squares is 8,864,460,599.633, and the df is 46. The Middle square is 192,705,665.209. The Overall component represents the total sum of squares, which is 148,445,385,914.378, and the df is 49. The value of the multiple correlation coefficient between the dependent variable (GDP) and the independent variables (investment, interest rate, inflation) indicates a very strong relationship between them. The coefficient of determination demonstrates that 94% of the variability of the dependent variable can be explained by the three selected factors. The closeness of the adjusted coefficient of determination to the usual one suggests that the number of indicators and their essence chosen was quite correct. It is necessary to develop a regression

Table 1: Correlation indices between the variables assessed

		GDP	Investments	Inflation	Interest rate
GDP	Correlation coefficient	1.000	607**	-460**	-829**
	Significance coefficient (sig. (2-tailed))		000	001	000
	Quantity	50	50	50	50
Investments	Correlation coefficient	607**	1.000	-007	-373**
	Significance coefficient (sig. (2-tailed))	000		959	008
	Quantity	50	50	50	50
Inflation	Correlation coefficient	-460**	-007	1.000	786**
	Significance coefficient (sig. (2-tailed))	.001	959		000
	Quantity	50	50	50	50
Interest rate	Correlation coefficient	-829**	-373**	786**	1.000
	Significance coefficient (sig. (2-tailed))	000	008	000	
	Quantity	50	50	50	50

*Note: ** – the correlation is considered reliable if the significance coefficient is greater than 0.01.*

Source: compiled by the authors.

Table 2: Regression coefficients

Model		Non-standardised ratios		Standardised ratios	t	Significance coefficient	95.0% confidence interval for B	
		B	Error term	Beta			Lower limit	Upper limit
1	Constant	197214.961	26329.248		7.490	000	144216.934	250212.987
	Investments	1.889	327	356	5.769	000	1.230	2.548
	Inflation	2088492.270	329169.674	513	6.345	000	1425908.082	2751076.459
	Interest rate	-4675469.964	393181.557	-943	-11.891	000	-5466903.389	-3884036.540

Source: Compiled by the authors.

equation that will characterize the resulting model using Formula 1. Table 2 presents the standardised and unstandardised regression coefficients of the model.

Considering the coefficients obtained in Table 2, a regression model can be constructed, which is represented by the following equation:

$$Y = 197214.961 + 1.843x_1 + 2115070.056x_2 - 4719649.467x_3 \qquad \dots(2)$$

where: Y – GDP; x_1 – investment volume; x_2 – inflation rate; x_3 – interest rate.

Using this model, a forecast for 2023 can be made. The constant value is 197,214.961. Investments are set at 1.889, indicating the level of investment considered in the model. The inflation value is 2,088,492.270, which represents the estimated inflation rate used in the model. The interest rate is -4,675,469.964, indicating the assumed interest rate in the model. On 6th November, the Supervisory Board of the Bank of Albania reviewed and approved the Monetary Policy Report (Bank of Albania, 2022). The NBU decided to raise the interest rate from 2.25% to 2.75%; monthly inflation was set at 8.42%, and the consumer price index at 111.2% (INSTAT, 2022). The average interest rate for the next year will be 2.50%. Nevertheless, there may be some deviations from the established standard, therefore, the author has developed three options for the level of GDP growth within the model. For investments, the level of the previous year was 121.139.1, and the forecasted growth rates for the adverse, basic, and positive scenarios are 2.80%, 3.50%, and 4.10%, respectively. Regarding inflation, the rate for the previous year was 8.20%, and the forecasted rates for the adverse, basic, and positive scenarios are 10.50%, 9.60%, and 9.50%,

respectively. The interest rate for the previous year was 2.75%, and the forecasted rates for the adverse, basic, and positive scenarios are 2.65%, 2.25%, and 2.00%, respectively. The GDP growth rate for the year 2023 is forecasted to be 0.22% in the adverse scenario, 1.29% in the basic scenario, and 2.53% in the positive scenario. Delaying the necessary actions to raise rates for too long could make the future fight against inflation increasingly difficult. The most dangerous scenario, therefore, is that the price increase gets completely out of control, leading to significant adverse macroeconomic effects in the future that will be much more difficult to address than they are now.

DISCUSSION

Measuring the accuracy of economic forecasts based on the literature examined in his study was conducted by G. Buturac (2022). The author notes that modern forecasting methods are constantly being improved and new ones are being established, which can be seen in modern publications. Thus, Y. Yu (2022) uses an economic forecasting model based on an advanced neural network RBF (Radial basis function) in his study. For this purpose, a specific period of training was used to train the network with specific amounts of data, after which it could provide fairly clear results. Therewith, S. Poledna *et al.* (2020) describe in some detail the possibilities for using the so-called Agent-based model. Notably, the author uses a correlation-regression model, which can predict future changes in the predicted values quite qualitatively.

In general, several factors influence changes in the level of GDP, which have been historically monitored and analysed for different countries by many researchers. However, they vary from author to author. Thus, V. Buterin *et al.* (2017) in their study

of the Croatian economy used a model with two dependent variables, namely GDP per capita and the share of exports in GDP, and five independent variables, namely the Economic Freedom Index, the Government Effectiveness Index, the Rule of Law Index, the Corruption Perceptions Index, and the Institutional Reforms in Transition Index. Good governance and its indicators have in many cases been considered independent variables in models of the impact of GDP growth in developing countries, especially in the Western Balkans (Pere, 2015). In contrast to the works analysed above, O. Nestorovic (2015) analyses internal factors that influence GDP growth in a developing economy, in particular, government direct investment. An attempt to model Albania's GDP by year was conducted by J. Fejzo (2012). As part of his work, the scientist analysed the impact of inflation, interest rate increases and the level of investment in the Albanian economy, which helped the author to formulate a forecast for the development of the gross product in the next 10 years.

F. Brahimi (2022) assessed the role of this component for the country. The scientist notes that FDI has the greatest impact on employment. Although such an impact is indirect, it nevertheless exists, which suggests that the described system is valid. E. Hysa and L. Hodo (2016) assessed the impact of foreign direct investment on the development of the Albanian economy. The scientists noted that there is indeed a correlation between GDP growth and FDI, which they proved using the Johansen test. It proves that investment attraction should be an important component of the country's policy, especially since the correlation between the gross domestic product and FDI is relatively higher in Ukraine than in other countries in the region. The population, as one of the important components of the country's economic well-being and growth, was assessed by A. Meta and A. Sejdini (2015). Thus, the researchers note that the country's population experienced a gradual decline after the fall of the communist regime. This population decline can be explained by the emigration of the bulk of the population to countries with better living standards. It is explained by the fact that such trends were more typical several decades ago and had the greatest impact then. Other scholars, namely O. Lubonja and E. Shehu (2022) paid attention to

demographic factors, namely urbanisation and its components. Based on the evaluation of statistical data, they conclude that with a 1% increase in GDP, the level of urbanisation in a country increased by 0.123% on average.

The specific features of the Albanian economy and prospects for its further development were explored by E. Ceko (2013). The scientist noted several major problems inherent in the country, namely rudimentary development, slow expansion of economic sectors, lack of links between economic sectors, high level of the informal sector (shadow economy) and lack of sufficient representation of the country's enterprises in the international arena. The problems in the context of the economy and monetary policy of Albania were considered by P. Novoszath (2023). After analysing the forecasts of the Bank of Albania regarding the future state of the country's economy and the activities of this institution, the researcher concludes that the current monetary and fiscal policy guarantees the monetary and financial stability of Albania. Nevertheless, Novoszath notes the risks that remain, for example – the impact of COVID-19 and the undeveloped financial markets in the country. Thus, in 2023, the author expects positive changes in the economic development of Albania (GDP growth), despite all the adverse indicators and external crises that adversely affect the country. However, any forecast is subject to deviations, which is particularly true in the last three years of the spread of external threats.

CONCLUSION

The study forecasts Albania's future GDP performance based on some of its macroeconomic factors, namely inflation, interest rates and investment levels. These indicators were chosen by the author, considering the specific features of the country's development and the correlation and regression relationships between the selected dependent and independent variables (they had 93.6% of the impact, while other factors had 6.4%).

Based on the research, the author concludes that the selected factors are significant in influencing the GDP of Albania. In the research, the author assumes that it will decline in 2023, which could result in higher GDP growth. Fighting inflation has become an important component of the stable growth of

the gross domestic product. In the case of Albania, it was most frequently developed by keeping the national currency at a stable level, which proved to be a very effective policy. As part of the research, the author estimated the most probable future values of investment flows to the country, considering, among other things, the level of inflation and interest rate, which allowed for more accurate forecasting. It is relevant for future research to make other similar forecasts in the context of Albania's GDP growth using other variables or increasing their number. In addition, it is essential to provide more advice on the development of the country's fiscal and monetary policies.

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