

American Journal of Economics and Business Management

**Vol. 8 Issue** 11 **| pp.** 5334-5342 **| ISSN:** 2576-5973

**Available online @** https://www.globalresearchnetwork.us/index.php/ajebm

*Article*

# Analysis of the Practical Situation of Interest Rate Policy in the Commercial Banks of the Republic of Uzbekistan

**Dilnoza Obid Qizi Orifova**

1. PhD Candidate, Tashkent State University of Economics

* Correspondence: orifovadilnoza1997.07@gmail.com

**Abstract:** Given the challenges of global inflationary pressure and Uzbekistan's liberalized monetary policy, interest rate policy plays a key role in both improving the performance of commercial banks and ensuring national economic stability. A gap in the knowledge to date is that the relationship between the volume of loans issued and the dynamics of interest rates has not yet been quantitatively assessed. Thus, there are no prior investigations of the problem to rely on, and most studies are theoretical and have to do with forecasting, not with the empirical relationship assessment aspect. In this research, I will use monthly data from 2020 to 2024 and apply statistical methods and the ARIMA model to assess the relationships and forecast the results for 2025-2026. Thus, the overall lending volume increased over the considered period, amounting to 4.3 trillion to 32.9 trillion UZS. At the same time, the weighted average on loans decreased from 26% to 23.5%. The results of the forecast show a further increase in the volume of loans issued to over 37 trillion UZS by 2026, while the interest rates will continue to stagnate at the minimum level of 22.2%. The decrease in the rate indicates that the availability of credit will increase, and the investment potential of the national economy will largely depend on the improved macroeconomic situation. This allows the conclusion that financial market stability is possible when competition strengthens, the deposit base expands, and best international practices are applied continuously in fixing the price of credit. Thus, the interest rate policy in Uzbekistan's commercial banks directly stimulates sustainable economic growth.

**Keywords:** Interest, interest rate policy, monetary policy, credit, weighted average interest rate, lending volume, inflation.

**Citation:** Orifova, D. O. Q. Analysis of the Practical Situation of Interest Rate Policy in the Commercial Banks of the Republic of Uzbekistan. American Journal of Economics and Business Management 2025, 8(11), 5334-5342

Received: 10th Aug 2025
Revised: 16th Sep 2025
Accepted: 24th Oct 2025
Published: 02th Nov 2025

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## 1. Introduction

The interest rates offered by commercial banks are among the key factors that significantly influence a country's economy. In particular, these rates affect macroeconomic indicators such as gross domestic product (GDP) and inflation.

In the *"Uzbekistan–2030"* strategy, one of the priority objectives defined within the framework of *"Ensuring public welfare through sustainable economic growth"* is to create the necessary conditions for reducing bank lending rates by 2–3 percentage points based on market mechanisms, as well as to increase the annual volume of lending in the banking and financial system to 40 billion U.S. dollars and to quadruple the volume of bank deposits [1].

Each commercial bank develops its own interest rate policy, and its effectiveness depends on the rates established for loans and deposits. The interest rates set on loans directly affect the volume of lending and, consequently, have a direct impact on the bank's net profit.

Literature Review

American economist **I. Fisher** explained the interest rate as follows: The level of interest can be defined as an interest premium, since it is expressed in money and must be paid after the agreed period [2].

**J. M. Keynes** stated that: The rate of interest is determined as the price paid for the use of capital in the market [3].

**V. V. Ostyakov** expressed the following view on loan interest: Loan interest simultaneously represents commodity–money, credit, and price relations that are interconnected at the general, particular, and individual levels. At the same time, the specific nature of loan interest lies in the fact that it expresses commodity–money relations arising solely from the price, the credit, and the movement of money as capital [4].

**M. S. Maramigina** and **E. N. Prokofieva** defined it as: Loan interest represents an economic category that reflects the relations between the creditor and the borrower arising in the process of movement of loan capital — it is a specific form of the price of credit [5].

**A. B. Borisov** described the concept as follows: The price of credit is the interest payment or rate that the debtor pays the creditor for the use of the loan, established by the bank based on supply and demand in the financial market [6].

According to **Sh. Z. Abdullayeva**, the interest rate policy of commercial banks is: One of the essential elements of a bank's overall policy, representing a set of measures related to establishing interest rates in the process of attracting and allocating funds, aimed at ensuring the bank's liquidity and profitability. In a broader sense, it is a set of actions aimed at coordinating economic relations through the management of interest rates [7].

**B. T. Berdiyarov** defines the **bank interest margin** as: The difference between the interest income generated from the bank's assets and the interest expenses on the bank's liabilities [8].

**I. Y. Qulliyev**, in his research paper *"Formation and Improvement of the Credit Price,"* distinguishes between the concepts of *loan interest* and *credit price* as follows: Loan interest is determined in the credit agreement and calculated according to established interest calculation methods, while the credit price includes all payments made by the client (interest and commission fees), reflecting the bank's total income from credit services [9].

Summarizing the above views, it can be concluded that: "Loan interest is the specific price of credit formed in the money and credit market based on the balance of supply and demand."

## 2. Materials and Methods

The study utilizes a quantitative and analytical research approach in order to investigate the existing situation with the interest rate policy in commercial banks in Uzbekistan and predict its further development. On the basis of the secondary statistical data extracted from the official reports of the banking system for the period between 2020 and 2024, two main quantitative indicators are analyzed in correlation: the weighted average interest rate on loans and the total volume of loans issued in national currency. The study aims to investigate the relationship between these two measures and predict their possible changes over time. At the same time, for the purpose of conducting the general investigation, the total volume of loans issued in national currency tends to approximate the overall total value of loans issued by commercial banks. The analysis is conducted with the help of appropriate statistical and econometrical tools.

For the purpose of financial forecasting, the study applied the main method of forecasting time-series data, i.e., the Auto-Regression Integrated Moving Average model, which has been widely used in scientific research due to its ability to accurately measure both trend and volatility patterns. Before the solution, all data were tested for stationarity using the Dickey–Fuller test. For the models in which the series were non-stationary, pre-differentiation was applied. The optimal parameters of the ARIMA model, i.e., autoregressive parameter, integration parameter, and moving-average parameter, were identified through the analysis of the autocorrelation and partial autocorrelation functions and selection of the appropriate model fit. As a follow-up step, the identified models were checked for validity, in particular, by residual analysis and the unit circle test. The final

phase of the research was the generation of technology forecasts of the changes in interest rates and the growth of lending including the period between 2025 and 2026.

## 3. Results and Discussion

When defining their strategies and policies, commercial banks must first determine both short-term and long-term forecast values. In this research, using monthly data from **2020–2024** on the banking system of the Republic of Uzbekistan, we analyze the practical situation regarding the **volume of lending in national currency** and the **weighted average interest rate**, and determine the forecast values for the coming period [10].

At present, more than **30 different economic models** are applied in global practice. Among them, the **ARIMA (Auto-Regression Integrated Moving Average)** model is a statistical tool widely used for forecasting **time series data.**

The ARIMA model is implemented in **three stages:**

1. Identification
2. Estimation
3. Forecasting

The research begins with the **"Identification"** stage of the **ARIMA model.** At this stage, the parameters **p, d,** and **q** are determined. The time series is tested for **stationarity,** the period of the **integration process** is identified, and based on this, the value of **d** is established (Figure 1).




**Figure 1.** Dynamics of changes in lending volume and loan interest rates in 2020–2024

When examining the dynamics of the **weighted average interest rate,** it can be observed that at the beginning of **2020** it was around **26%,** followed by a sharp decline by the end of the year. In the subsequent months, loan interest rates began to rise gradually and reached **23.5%** by the end of **2024.**

Similarly, the overall trend in **lending volume** also shows steady growth — increasing from **4.3 trillion UZS** in 2020 to **32.9 trillion UZS** in 2024. This indicates a consistent development of lending activities and an expansion of the banks' resource base [11].

The time series was tested for **stationarity** using the **Dickey–Fuller test**. According to this test, the condition **p-value < 0.05** must be satisfied. Based on the obtained *p-value*, the following hypotheses are either accepted or rejected:

**$H_0$:** The time series is stationary.

**$H_1$:** The time series is non-stationary.

If the **p-value < 0.05**, the **null hypothesis ($H_0$)** is accepted and the **alternative hypothesis ($H_1$)** is rejected. Conversely, if the **p-value > 0.05,** the alternative hypothesis is accepted and the null hypothesis is rejected.

If the time series is found to be **non-stationary**, it can be transformed into a **stationary form**. To achieve this, the time series must be **differenced.**

Dickey-Fuller test for unit root — Number of obs = **59**

| | Test Statistic | 1% Critical Value | 5% Critical Value | 10% Critical Value |
|---|---|---|---|---|
| | | Interpolated Dickey-Fuller | | |
| Z(t) | **-2.568** | **-3.567** | **-2.923** | **-2.596** |

MacKinnon approximate p-value for Z(t) = **0.0998**

**Figure 2.** Dickey–Fuller test for the average loan interest rate

According to the test results, the **p-value = 0.0998.** Therefore, the **null hypothesis** is rejected, and the **alternative hypothesis** is accepted — indicating that the time series is **non-stationary (Figure 2).** To make the series stationary, it is **differenced** and then re-tested for **stationarity.**

Dickey-Fuller test for unit root — Number of obs = **58**

| | Test Statistic | 1% Critical Value | 5% Critical Value | 10% Critical Value |
|---|---|---|---|---|
| | | Interpolated Dickey-Fuller | | |
| Z(t) | **-7.708** | **-3.569** | **-2.924** | **-2.597** |

MacKinnon approximate p-value for Z(t) = **0.0000**

**Figure 3.** Dickey–Fuller test for the first-order differenced series

In the first-order differenced series, the **p-value < 0.005,** and the **test statistic value** is smaller than the **1%, 5%, and 10% critical values**, specifically **(–7.708).** Based on this result, it can be concluded that the **loan interest rate is first-order stationary**. Accordingly, the value of **d** is set to **1 (d = 1) (Figure 3) [12].** Next, the **lending volume** is tested for **stationarity.**

Dickey-Fuller test for unit root — Number of obs = **59**

| | Test Statistic | 1% Critical Value | 5% Critical Value | 10% Critical Value |
|---|---|---|---|---|
| | | Interpolated Dickey-Fuller | | |
| Z(t) | **-2.001** | **-3.567** | **-2.923** | **-2.596** |

MacKinnon approximate p-value for Z(t) = **0.2862**

**Figure 4.** Dickey–Fuller test for lending volume

The results show that the **MacKinnon approximate p-value for Z(t) = 0.2862**, indicating that the **time series is non-stationary.** The time series is then **integrated,** and the resulting series is subsequently **tested for stationarity (Figure 5).**

Dickey-Fuller test for unit root — Number of obs = **58**

| | Test Statistic | Interpolated Dickey-Fuller: 1% Critical Value | 5% Critical Value | 10% Critical Value |
|---|---|---|---|---|
| Z(t) | **-15.296** | **-3.569** | **-2.924** | **-2.597** |

MacKinnon approximate p-value for Z(t) = **0.0000**

**Figure 5.** Dickey–Fuller test for the first-order differenced series

According to the obtained results, the **integrated series is stationary**, and based on this, the value of **d** for **lending volume** is set to **1 (d = 1).**

In the next stage, the values of **p** and **q** are determined. The essence of these parameters lies in the fact that they indicate the presence of **autocorrelation** within the time series and its **residuals [13].**

First, the relationship between the variables in the time series — whether they are interdependent or independent — is examined in order to determine the value of **q (Figure 6).**

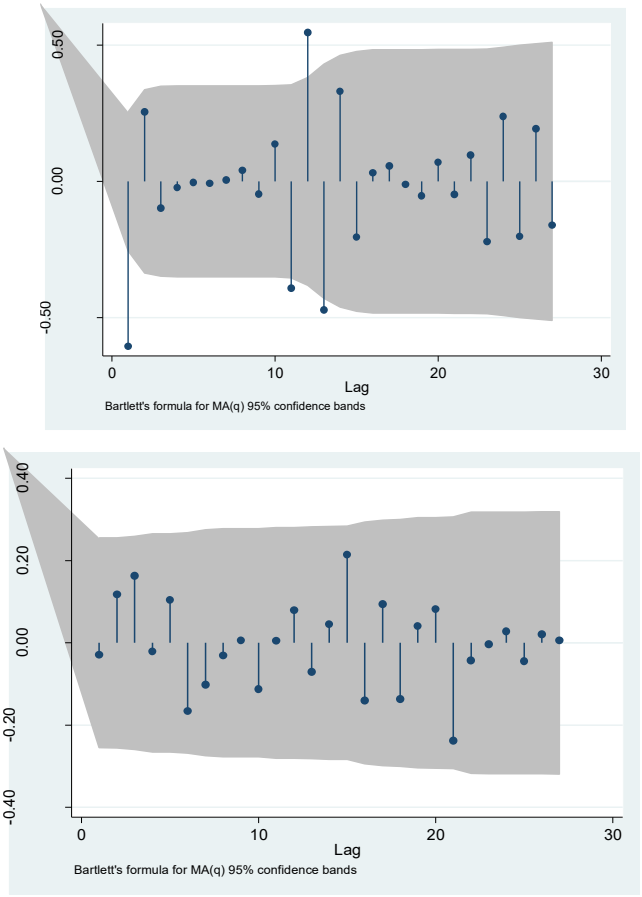



**Figure 6.** Results of autocorrelation lags

Autocorrelation is present in the time series, as not all lags fall within the confidence interval. This indicates that there is a **second-order autocorrelation** among the residuals of the **weighted average loan interest rate,** meaning **q = 2,** while for **lending volume, five lags** lie outside the confidence interval, thus **q = 5.**

Next, the **values of p** are determined **(Figure 7)**.

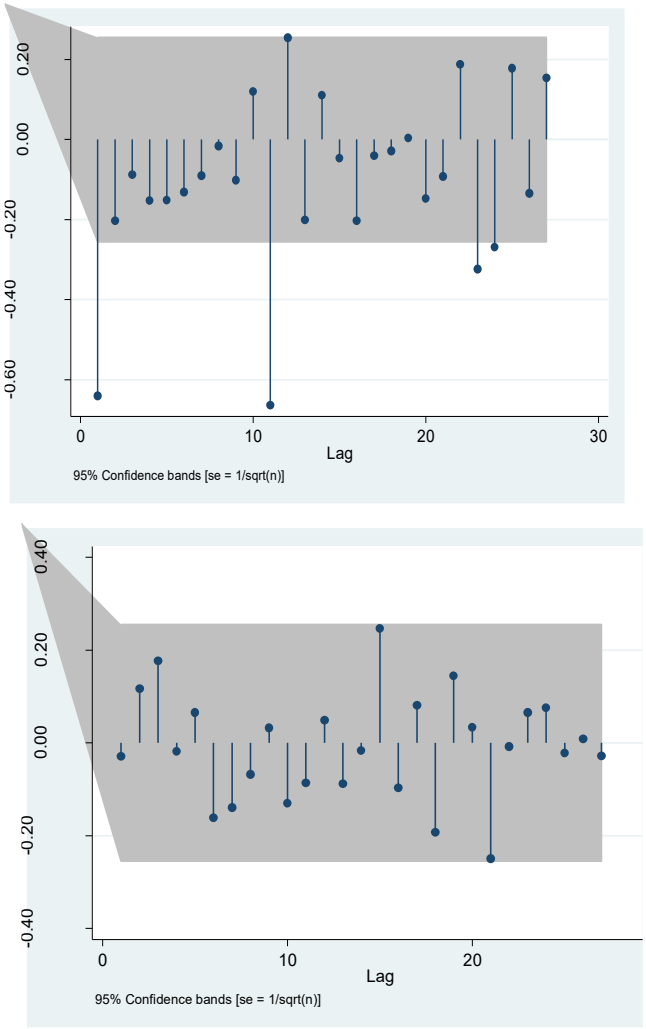



**Figure 7.** Partial autocorrelations

According to the results of the **partial autocorrelations**, four lags in the autocorrelation of the **weighted average loan interest rate** fall outside the confidence interval, thus **p = 4**, while for **lending volume**, six lags are outside the interval, so **p = 6.**

Accordingly, after determining the required **p, d, and q** values for the **ARIMA method,** combinations of these parameters are written in the following sequence:

ARIMA=(p,d,q)=(0,1,0), ARIMA=(p,d,q)=(1,1,1), ARIMA=(p,d,q)=(0,1,1), ARIMA=(p,d,q)=(1,1,0), ARIMA=(p,d,q)=(2,1,1), ARIMA=(p,d,q)=(2,1,2)

In the **Estimation** stage of the **ARIMA method,** the significance (or quality) of the selected models is evaluated based on **five different criteria**, and the most suitable model is chosen.

According to the evaluation results, among the models considered, the **ARIMA (2,1,2)** model is identified as optimal for forecasting the **weighted average loan interest rate,** while the **ARIMA (2,1,0)** model is optimal for forecasting **lending volume.**

In the final stage of the ARIMA method — the **Forecasting** stage — forecast scenarios are developed for the selected optimal models. Before performing the forecasting, it is advisable to examine the residuals of the chosen model using various methods. For the model to provide reliable forecasts, the **mean of the residuals** should be equal to (or close to) **zero,** and the **[AR][I][MA] parameters** — that is, the characteristic values of the existing **p, d, q** structure — must lie **within the unit circle.**

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Residue | 59 | -.0342967 | .6519802 | -3.130069 | 1.91059 |

**Figure 8.** Determination of the residual mean

From the figure above, it can be seen that the **mean of the residuals** is very close to zero and, when rounded, is effectively equal to zero **(Figure 8) [14]**. This indicates that the model selected for determining the **forecast indicators of the weighted average loan interest rate** satisfies the required condition.

Next, the reliability of the model is verified using the **unit circle** method.

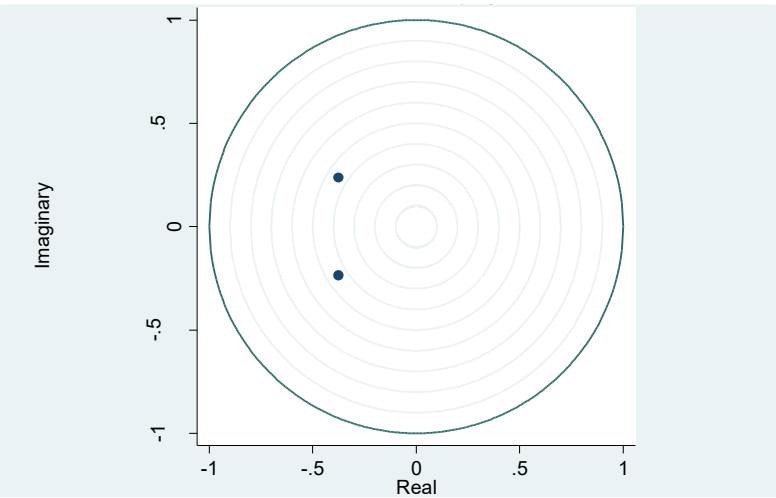



**Figure 9.** Inverse roots of AR polynomial

As shown in the figure, the characteristic values of the existing **p, d, q** structure lie **within the unit circle**, which provides a solid basis for conducting reliable forecasting using the selected model **(Figure 9)**.

Using this model, we then construct a **graph of forecast indicators for the years 2025–2026.**

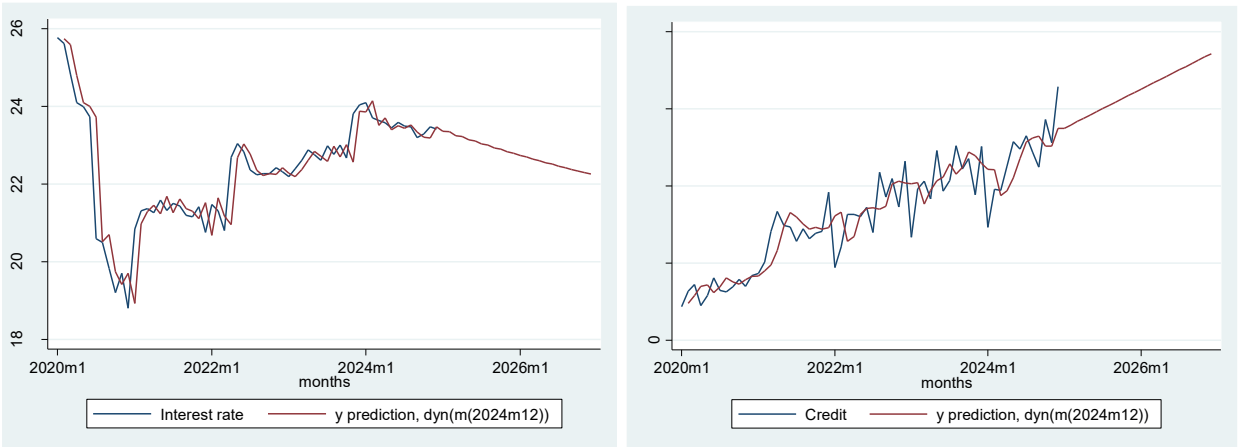



**Figure 10.** General view of forecasted and empirical values

In the graph, the **actual values** and the **forecasted values** of the model are presented together on a single chart by month **(Figure 10)**. Notably, the **loan interest rate** demonstrates a **declining trend** up to the end of **2026**, while the **lending volume** shows a **consistent upward trend.**

To present the data more clearly, the **forecast indicators of both models** are summarized in the following **table.**

**Table 1.** Forecast indicators for 2025–2026 based on the ARIMA model

| **2025** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Months | jan | feb | mar | apr | may | Jun | jul | aug | sep | oct | nov | Dec |
| Credit, bln UZS | 27465 | 27909 | 28391 | 28758 | 29205 | 29614 | 30036 | 30455 | 30874 | 31294 | 31713 | 32133 |
| Interest rate, % | 23,36 | 23,35 | 23,25 | 23,23 | 23,14 | 23,11 | 23,03 | 23 | 22,93 | 22,90 | 22,83 | 22,8 |
| **2026** | | | | | | | | | | | | |
| Months | jan | feb | mar | apr | may | Jun | jul | aug | sep | oct | nov | Dec |
| Credit, bln UZS | 32552 | 32971 | 33391 | 33810 | 34230 | 34649 | 35068 | 35488 | 35907 | 36326 | 36746 | 37165 |
| Interest rate, % | 22,73 | 22,7 | 22,64 | 22,6 | 22,55 | 22,51 | 22,46 | 22,42 | 22,38 | 22.34 | 22,29 | 22,26 |

According to the results of forecasts conducted using the **ARIMA model,** during **2025–2026** interest rates are expected to **gradually decline to around 22.2%**, while the **volume of lending** is projected to **exceed 37 trillion UZS (Table 1)**. This indicates an increase in **economic activity** and the **acceleration of investment processes.**

When compared to global experience, in developed countries, a decrease in interest rates tends to increase the demand for credit resources, which in turn accelerates economic growth [15]. The forecasted indicators for **Uzbekistan** correspond to similar tendencies.

## 4. Conclusion

The results of the study made it possible to emphasize that commercial banks' interest rate policy in Uzbekistan is fundamental to ensuring macroeconomic sustainability and supporting stable growth. According to the analysis of 2020–2024 data with the help of the ARIMA model, the tendency for the loan amount to grow regularly has been confirmed: from 4.3 trillion to 32.9 trillion UZS. The interest rate itself also tends to gradually decrease: from 26% to 23.5%, which characterizes the dynamics expected in 2025–2026 at around 22.2% with the amount of lending more than 37 trillion UZS. These findings may indicate a potential sustainable macroeconomic performance of expanding funding opportunities, increased availability of credit, and improved financial intermediation. Hereby, the conclusions can suggest that it is necessary for stakeholders to implement such activities to succeed in this positive market scenario. With a growing range of bank products, local stakeholders should strengthen competitive mechanisms within the credit market, borrow international practices in crediting resource pricing, and develop a long-term interest rate policy and profitability in a balanced manner. An important condition for such measures is to attract the population and businesses to deposit finances to secure the banking sector's liquidity and stability. Future studies are expected to consider the dynamics of interest rates effect on the investment trends of businesses, the risks of inflation, and unemployment, as well as the impact of digital financial transformation on interest rate policy. Such studies will contribute to improving the financial architecture of Uzbekistan and facilitating the stability of its banking system in the world's evolving economic landscape.

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