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THE IMPACT OF ECONOMIC POLICY ON NON-PERFORMING LOANS: THE CASE OF UZBEKISTAN

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Abstract: This study investigates the impact of economic policy variables on non-performing loans (NPLs) in Uzbekistan's banking sector using panel data regression analysis. The empirical results reveal that a tighter monetary policy and stronger financial supervision significantly reduce NPLs, while expansionary fiscal policy, exchange rate volatility, and high credit-to-deposit ratios contribute to their increase. Additionally, macroeconomic stability indicators such as GDP growth and bank-specific factors like return on assets (ROA) and bank size are found to play a crucial role in determining NPL dynamics. These findings suggest that coordinated macroeconomic and regulatory policies are essential for ensuring financial stability and improving credit quality in the banking sector. Policy recommendations emphasize the need for prudent monetary and fiscal policies, enhanced risk management, and stronger supervisory frameworks to mitigate credit risks and support sustainable financial development in Uzbekistan.

Key words: non-performing loans, monetary policy, fiscal policy, financial supervision, economic growth, exchange rate volatility, banking sector, Uzbekistan, credit risk, financial stability.

Annotatsiya: Ushbu tadqiqot O'zbekiston bank sektorida muammoli kreditlar (NPLs)ga iqtisodiy siyosat omillarining ta'sirini panel ma'lumotlar asosida regressiya tahlili orqali o'rganadi. Empirik natijalar shuni ko'rsatadiki, qat'iy monetar siyosat va kuchli moliyaviy nazorat NPL darajasini sezilarli kamaytiradi, aksincha, ekspansiv fiskal siyosat, valyuta kursining o'zgaruvchanligi va yuqori kredit-depozit nisbati ularning ortishiga olib keladi. Shuningdek, YAIM o'sishi kabi makroiqtisodiy barqarorlik indikatorlari va ROA hamda bank hajmi kabi bankga xos ko'rsatkichlar NPL dinamikasida muhim rol o'ynaydi. Olingan natijalar makroiqtisodiy va tartibga soluvchi siyosatlarning uyg'unlashuvi bank sektorida moliyaviy barqarorlik va kredit sifati yaxshilanishida muhim omil ekanligini tasdiqlaydi. Siyosiy tavsiyalar ehtiyotkor monetar va fiskal siyosat yuritish, risklarni samarali boshqarish va moliyaviy nazorat tizimini kuchaytirishni o'z ichiga oladi.

Kalit so'zlar: muammoli kreditlar, monetar siyosat, fiskal siyosat, moliyaviy nazorat, iqtisodiy o'sish, valyuta kursining o'zgaruvchanligi, bank sektori, O'zbekiston, kredit xatarlari, moliyaviy barqarorlik.

Аннотация: В данном исследовании рассматривается влияние факторов экономической политики на уровень неработающих кредитов (NPL) в банковском секторе Узбекистана посредством регрессионного анализа с использованием панельных данных. Эмпирические результаты показывают, что жесткая денежно-кредитная политика и строгий финансовый надзор значительно снижают уровень NPL, в то время как экспансионистская фискальная политика, волатильность обменного курса и высокое соотношение кредитов к депозитам увеличивают его. Кроме того, макроэкономические показатели стабильности, такие как рост ВВП, и специфические банковские показатели, такие как рентабельность активов и размер банка, играют важную роль в динамике NPL. Результаты подтверждают, что координация макроэкономической и регуляторной политики является важным фактором повышения финансовой стабильности и качества кредитов в банковском секторе. Рекомендации по политике включают осмотрительную денежно-кредитную и фискальную политику, эффективное управление рисками и укрепление системы финансового надзора.

Ключевые слова: проблемные кредиты, денежно-кредитная политика, фискальная политика, финансовый контроль, экономический рост, волатильность обменного курса, банковский сектор, Узбекистан, кредитные риски, финансовая стабильность.

INTRODUCTION

In recent years, the large-scale reforms implemented in Uzbekistan's banking and financial system have not only aligned economic governance mechanisms with market principles but have also contributed to enhancing the efficiency of the banking sector. In particular, measures aimed at ensuring the independence of monetary policy, strengthening fiscal discipline, liberalizing foreign exchange policy, and aligning interest rates

with market mechanisms have had a significant impact on banks' lending strategies. These factors, in turn, play a critical role in shaping the quality of commercial banks' credit portfolios and the level of non-performing loans (NPLs).

Today, the impact of economic policy on financial stability is complex and multifaceted, becoming one of the central areas within banks' risk management systems. Non-performing loans represent one of the core challenges in the banking and financial sector. They undermine the effectiveness of financial intermediation, reduce the profitability of banks, and negatively affect economic growth rates. Loan defaults lead to an accumulation of non-performing assets on bank balance sheets, posing risks not only to bank capital but also to the overall financial stability of the national economy.

In particular, a slowdown in economic growth, high inflation, exchange rate volatility, or political uncertainty can deteriorate credit quality. Under such conditions, the role of government-led economic policies—fiscal spending, tax incentives, monetary policy actions, and financial regulatory mechanisms—requires thorough scientific analysis to understand their impact on the level of non-performing loans.

Since 2018, Uzbekistan has been implementing broad fiscal and monetary policy reforms aimed at economic liberalization. On the fiscal side, public expenditures have increased significantly, with substantial resources allocated to social and infrastructure projects [1]. Simultaneously, preferential lending programs have supported small businesses and startups, contributing to the expansion of banks' credit portfolios. However, in some cases, insufficient assessment of credit risks and weaknesses in loan recovery mechanisms have led to a rise in the share of non-performing loans.

On the monetary policy front, the Central Bank has adopted an inflation-targeting regime, raised interest rates, and gradually tightened the money supply. While these measures may have helped reduce NPL levels in the short term, they may also risk dampening economic activity.

Accordingly, this study aims to address the following research questions: First, what is the impact of fiscal policy instruments—such as budget expenditures, government guarantees, and tax incentives—on the level of non-performing loans (NPLs)? Second, how do monetary policy tools, including interest rates, money supply, and the inflation-targeting regime, influence the formation of NPLs? Third, what is the effect of exchange rate volatility or regulation, as well as the prudential and supervisory requirements introduced by financial regulators, on the quality of credit portfolios? Fourth, what are the outcomes of economic stimulus programs—such as subsidies, preferential loans, and government guarantees—on the dynamics of NPL levels?

By addressing these questions, the study seeks to empirically analyze the mechanisms through which economic policy affects non-performing loans.

The primary objective of the research is to determine the impact of fiscal, monetary, and regulatory policy measures implemented in Uzbekistan's banking sector during the period 2010–2024 on the level of non-performing loans. To achieve this goal, a theoretical and empirical model will be developed, and the analysis will be conducted based on official statistical data.

The study is guided by the following hypotheses:

H1: Fiscal expansion increases the volume of non-performing loans;

H2: Monetary tightening reduces the NPL level;

H3: Strong regulatory policy improves the quality of credit portfolios;

H4: Exchange rate volatility contributes to credit deterioration;

H5: As competition among banks intensifies, the impact of policy instruments on NPLs becomes more pronounced.

This study is among the first systematic efforts to empirically and theoretically analyze the impact of economic policy on non-performing loans (NPLs) within Uzbekistan's banking sector. While existing literature has separately examined fiscal and monetary policy factors, their interrelation with credit portfolio quality—particularly in the context of Uzbekistan—has not been sufficiently addressed. This research fills that gap and provides important insights into how policy decisions influence banking risks.

The empirical model developed in this study quantitatively evaluates the statistical relationship between NPLs and fiscal (e.g., budget expenditures, government guarantees), monetary (e.g., interest rates, inflation targeting), and financial regulatory policies (e.g., capital adequacy norms, reserve requirements). The model is adapted to Uzbekistan's institutional and structural context, taking into account the unique characteristics of its banking system. The findings provide policymakers with robust evidence to support risk management strategies and measures to stabilize NPL levels.

Furthermore, the study examines how economic policies affect competition among banks and the efficiency of financial intermediation. The results suggest that economic stimulus measures—such as preferential loans, subsidies, and state guarantees—may contribute to an increase in NPL levels, indicating a need for reconsideration of such policies. At the same time, the tightening of monetary policy and the strengthening of regulatory oversight are shown to reduce the share of non-performing loans.

This research offers practical recommendations aimed at enhancing the effectiveness of economic policy in Uzbekistan's financial sector. Its findings can inform decision-making processes at the Central Bank, the Ministry of Finance, and commercial banks. Moreover, the methodological approach and conclusions may serve as a model for other emerging economies.

In summary, this study contributes to the body of knowledge with both theoretical and practical relevance, applicable at the national and international levels. It proposes new, evidence-based approaches to banking reforms, credit policy, and financial stability enhancement.

LITERATURE REVIEW

Non-performing loans (NPLs) are considered one of the most significant threats to the stability of the banking system. Such loans can lead to liquidity problems for banks, reduced profitability, and disruptions to the overall stability of the financial system. Therefore, understanding the impact of economic policy on NPLs is a critical issue in preventing financial crises, ensuring the resilience of the banking sector, and promoting the development of the financial system. This section presents a review of international and domestic studies that have examined the influence of various aspects of economic policy—fiscal, monetary, exchange rate, and financial regulation—on non-performing loans. It also considers existing research related to Uzbekistan's banking sector.

In international practice, the impact of economic policy on NPLs has been studied across various countries. For instance, in a study conducted in Spain, Jiménez et al. (2012) [8] investigated the effects of fiscal policy on the quality of credit portfolios. They found that government support through loan guarantees and subsidies led to changes in banks' lending behavior, which ultimately contributed to a rise in NPLs. Similar findings were confirmed in studies on Mexico [9] and South Korea (Kang et al., 2015).

The impact of monetary policy on NPLs has also been widely examined. Bernanke (1999) [3] emphasized that during periods of monetary tightening, banks are more likely to face liquidity constraints, which in turn reduce borrowers' ability to repay loans. This hypothesis was later supported by Kupke (2005) [12] in the case of Germany. These studies show that higher interest rates may lead banks to reduce lending, which can either improve credit portfolio quality or, conversely, lead banks to increase collateralization of existing loans to manage risks.

Exchange rate policy also has a direct effect on NPLs. Demirgüç-Kunt and Huizinga (1999) [4] found that exchange rate volatility tends to weaken the quality of banks' credit portfolios, particularly in countries with a high share of foreign currency-denominated loans. This trend is especially evident in countries like Turkey [5] and several South American economies [6]. Exchange rate instability introduces additional financial risks for banks, which ultimately impairs borrowers' repayment capacity.

Financial regulatory policy also plays a crucial role in determining the level of non-performing loans (NPLs). Barth et al. (2006) [2] demonstrated that stronger financial supervision improves the quality of banks' credit portfolios. In particular, strict prudential requirements, the enhancement of accounting standards, and the obligation for banks to maintain adequate capital levels are associated with a reduction in NPLs. Conversely, weak financial oversight increases banks' propensity to engage in risky lending practices.

The impact of economic policy on NPLs has also been studied in developing countries. For example, Appadu (2012) [1] analyzed the effect of fiscal policy on credit portfolios in Ghana. The study found that increased government spending can expand banks' lending activities but may simultaneously result in a decline in credit quality. Similar outcomes were observed in India [7] and China [14].

The influence of monetary policy has also been widely investigated. In studies conducted in China, Zhou et al. (2019) [15] found that lower interest rates can encourage greater loan issuance by banks, but this expansion may come at the expense of credit quality. The underlying reason is that lower interest rates may lead banks to relax lending standards and finance riskier projects.

Exchange rate policy also has substantial implications for NPLs in developing economies. For instance, research conducted in Turkey [5] found that exchange rate fluctuations reduce the quality of credit portfolios, particularly in countries with a high proportion of foreign currency-denominated loans. Exchange rate volatility introduces additional financial risks for banks, thereby weakening borrowers' repayment capacities.

The impact of financial supervision is also significant. For example, studies in India [7] revealed that strong central bank oversight contributes to improving the quality of bank credit portfolios. Strict enforcement of prudential norms, enhanced accounting standards, and the requirement for banks to maintain sufficient capital levels are all associated with a decline in NPLs.

In the most recent phase of development in Uzbekistan's banking sector, the issue of non-performing loans has gained increasing attention. However, there remains a lack of comprehensive research examining the influence of economic policy on NPLs. To date, studies in Uzbekistan have primarily focused on credit portfolio

quality, particularly the repayment performance of loans issued to small and medium-sized enterprises [13], [11] while the impact of broader economic policy variables on NPLs has not been thoroughly explored.

Raximov (2020) [13] analyzed the composition of NPLs and their impact on economic growth in Uzbekistan's banking sector. The study found that the increase in NPLs was largely due to risky lending practices and weakened credit standards. However, the role of economic policy factors was not addressed.

Karimov (2021) [11] studied the quality of credit portfolios in Uzbekistan, with a focus on loans issued to small and medium-sized enterprises. The research explored the relationship between lending standards, repayment capacity, and financial oversight. Nonetheless, the study did not deeply examine the impact of economic policy factors on NPLs.

Findings from both international and domestic research indicate that economic policy factors influence the level of NPLs both directly and indirectly. However, in the context of Uzbekistan, these causal mechanisms remain insufficiently studied. This underscores the relevance and urgency of the present research.

While existing international and national studies have analyzed the effects of various dimensions of economic policy—fiscal, monetary, exchange rate, and financial regulation—on non-performing loans, the channels of impact in the Uzbek context remain underexplored. This study aims to fill that gap by thoroughly examining the dynamics of NPLs in Uzbekistan's banking sector, specifically focusing on the period from 2010 to 2024. It also seeks to quantify the magnitude and direction of influence of each policy dimension. Ultimately, the study provides practical recommendations to policymakers based on its findings.

RESEARCH METHODOLOGY

This study investigates the impact of economic policy factors on the level of non-performing loans (NPLs) in Uzbekistan's banking sector, based on data covering the period from 2011 to 2024. Given that a panel data model is employed, the analysis captures both the temporal dynamics of bank-level variables and the interactions among them. This methodology allows for a deeper understanding of the relationship between economic policy measures and banking sector performance.

The data used in this research are sourced from the Central Bank of Uzbekistan, the World Bank, the International Monetary Fund (IMF), the Bank for International Settlements (BIS), the State Statistics Committee of Uzbekistan, as well as individual bank-level reports. These sources provide information on banks' financial indicators (such as the NPL ratio, return on assets [ROA], liquidity, and bank size), macroeconomic variables (including GDP growth rate, inflation, and exchange rate volatility), and economic policy measures (such as interest rates, budget deficit, and tax policy). The dataset is constructed using annual observations at the bank level, covering 25 commercial banks over a 14-year period.

The dependent variable in the study is the NPL ratio, defined as the share of non-performing loans in the total credit portfolio (%), which is one of the most widely used indicators for assessing credit portfolio quality. The key independent variables include indicators representing monetary policy, fiscal policy, and financial regulatory policy. The following methods have been used to measure these variables:

Monetary Policy: Interest rates were standardized using the min-max method on a scale from 0 to 100. Additionally, the number of monetary policy actions implemented was taken into account. The sum of these two indices was used as a composite variable representing the degree of monetary policy activity.

Fiscal Policy: The budget deficit was also standardized using the min-max method. In addition, the number of fiscal measures related to tax policy was included. The combined index of these two indicators was used as a proxy variable reflecting the intensity of fiscal policy.

Financial Regulatory Policy: This variable captures prudential requirements, accounting standards, and capital adequacy regulations implemented by the Central Bank.

The model also includes several control variables:

Economic Growth (GDP Growth Rate) – reflects the level of economic activity in the country;

Exchange Rate Volatility – represents the degree of financial risk exposure;

Bank-Specific Factors – including the credit-to-deposit ratio, bank size, and return on assets (ROA).

The model is specified as follows:

$$NPL_{it} = \alpha + \beta_1 MonetaryPolicy_{it} + \beta_2 FiscalPolicy_{it} + \beta_3 Regulation_{it} + \gamma X_{it} + \epsilon_{it}$$

where:

NPL_{it} – the ratio of non-performing loans for bank i in year t;

$MonetaryPolicy_{it}$ – the level of monetary policy, proxied by a standardized index of interest rates and the number of monetary policy actions;

$FiscalPolicy_{it}$ – the level of fiscal policy, proxied by a standardized budget deficit index and the number of tax policy measures;

$Regulation_{it}$ – the intensity of financial regulatory policy, including prudential requirements, capital adequacy, and accounting standards;

X_{it} – a vector of control variables including GDP growth rate, exchange rate volatility, credit-to-deposit ratio, bank size, and return on assets (ROA);

ϵ_{it} – the error term.

Given the presence of both cross-sectional (across banks) and temporal (over time) variation in the dataset, panel regression techniques were employed to analyze the relationship between economic policy variables and non-performing loans. In order to determine the appropriate model specification—Fixed Effects (FE) or Random Effects (RE)—the Hausman test was conducted. The results of the Hausman test indicated that the Fixed Effects model is more suitable for the data. Consequently, the empirical analysis is based primarily on the Fixed Effects estimator.

In addition to estimating the panel regression model, several post-estimation diagnostic tests were performed to verify the robustness and adequacy of the model specification. These include:

Multicollinearity: Examined using the Variance Inflation Factor (VIF). The VIF values for all explanatory variables were below the conventional threshold of 10, indicating no serious multicollinearity concerns among the regressors.

Autocorrelation: Tested using the Wooldridge test for autocorrelation in panel data. The test results confirmed the absence of first-order autocorrelation in the panel structure.

Model Specification: Validated using the Ramsey RESET test. The test supported the hypothesis that the model is correctly specified, suggesting that the functional form of the regression equation is appropriate.

Descriptive statistics of the variables used in the model are presented in Table 1.

Table 1. Descriptive Statistics of Key Variables

Variables	Mean	Standart dev.	Min	Max
NPL, %	7.8	3.2	2.1	15.6
Monetary Policy Index	64.5	18.3	30.0	95.0
Fiscal Policy Index	58.2	21.4	25.0	98.0
Regulation Index	72.1	14.6	45.0	92.0
GDP Growth, (%)	5.4	1.8	2.3	8.9
Exchange Rate Volatility	0.12	0.05	0.03	0.25
Credit-to-Deposit Ratio	82.4	12.7	60.0	105.0
Bank Size (log assets)	13.6	1.2	11.5	16.0
Return on Assets (ROA, %)	1.7	0.8	0.2	3.5

The descriptive statistics presented in Table 2 are based on annual data from 14 commercial banks in Uzbekistan over the period 2011–2024. The average ratio of non-performing loans (NPLs) stands at 7.8 percent, which is a critical indicator reflecting the overall quality of banks' loan portfolios. The minimum value of the NPL ratio is 2.1 percent, while the maximum reaches 15.6 percent, suggesting substantial variation in credit risk levels across banks.

The monetary policy index, proxied by the interest rate index, averaged 64.5, indicating a moderate level of monetary policy stringency. The fiscal policy index, reflecting the state budget deficit dynamics, averaged 58.2, which implies a relatively stable and consistent fiscal policy stance over the study period. The financial regulatory index registered the highest average value of 72.1, highlighting the strength of prudential oversight measures undertaken by the Central Bank, including capital adequacy, risk management, and supervision frameworks.

Among the macroeconomic variables, GDP growth averaged 5.4 percent, indicating steady and sustained economic expansion in Uzbekistan. Exchange rate volatility was relatively low, with an average value of 0.12, though still noteworthy in terms of associated currency risk.

Among bank-specific variables, the average credit-to-deposit ratio was 82.4 percent, suggesting that banks were actively utilizing deposits to finance lending operations. The average bank size, measured in logarithmic form, was 13.6, reflecting the inclusion of institutions with diverse asset scales in the sample. The return on assets (ROA) averaged 1.7 percent, indicating moderate profitability levels across the banking sector.

Taken together, these descriptive statistics offer a solid empirical foundation for examining the factors influencing the NPL ratio in the Uzbek banking system.

Overall, the methodological approach adopted in this study enables a rigorous empirical assessment of how key dimensions of economic policy—namely monetary policy, fiscal policy, and regulatory oversight—affect the level of non-performing loans. The following section presents and interprets the results of the panel regression models and discusses the policy implications of the findings.

ANALYSIS AND RESULTS

This section evaluates the impact of economic policy factors on the level of non-performing loans (NPLs) in Uzbekistan's banking sector using panel regression analysis over the period 2011–2024. Based on the results of the Hausman test, the Fixed Effects (FE) model was selected as the most appropriate specification for the dataset. The empirical estimations are conducted accordingly.

The estimation results from the baseline fixed effects model are presented in Table 2 below. The model includes key economic policy variables—monetary policy, fiscal policy, and financial regulation—as well as a set of macroeconomic and bank-specific control variables.

Table 2. Fixed Effects Model Results (Dependent Variable: NPL Ratio)

Variable	Coef. (β)	Standart xato	P-value	95% conf. interval
Monetary Policy Index	-0.042***	0.012	0.001	[-0.066 ; -0.018]
Fiscal Policy Index	0.038**	0.015	0.012	[0.009 ; 0.067]
Regulation Index	-0.051***	0.013	0.000	[-0.076 ; -0.026]
GDP Growth, (%)	-0.134***	0.040	0.001	[-0.213 ; -0.056]
Exchange Rate Volatility	2.876**	1.210	0.020	[0.498 ; 5.254]
Credit-to-Deposit Ratio	0.015*	0.008	0.064	[-0.001 ; 0.031]
Bank Size (log assets)	-0.321**	0.150	0.032	[-0.616 ; -0.026]
Return on Assets (ROA, %)	-0.482***	0.098	0.000	[-0.676 ; -0.288]
Constant	12.853***	2.153	0.000	[8.629 ; 17.077]
R^2	0.689			

The regression results presented in the table above aim to examine the impact of economic and banking sector variables on the level of non-performing loans (NPLs) in Uzbekistan over the period 2011–2024. For each independent variable, the estimated coefficient (β), standard error, p-value, and 95% confidence intervals are provided. From an economic standpoint, the analysis reveals that certain policy and financial indicators have a statistically significant influence on NPL dynamics.

First and foremost, the monetary policy variable—represented by an interest rate index—shows a negative and statistically significant effect on NPLs ($\beta = -0.042$, $p < 0.01$). This suggests that when the Central Bank tightens monetary policy by raising interest rates, the level of NPLs in the banking sector tends to decrease. This effect is likely due to reduced credit demand as borrowing becomes more expensive, thereby limiting excessive lending and improving overall credit quality.

Similarly, the fiscal policy variable—measured via a budget deficit index—has a positive and statistically significant impact on NPLs ($\beta = +0.038$, $p = 0.012$). This implies that larger budget deficits may lead to an increase in credit risk within the banking sector. Expansive fiscal policies may generate macroeconomic uncertainties and raise the perceived risk among borrowers, a hypothesis consistent with theoretical findings [3], [12].

Another key factor is the financial regulation index, which exhibits a strong negative and statistically significant relationship with NPLs ($\beta = -0.051$, $p < 0.01$). This indicates that more stringent and effective regulatory oversight contributes to lower levels of non-performing loans. Stronger supervision fosters financial discipline among banks and reduces risk-taking behavior, supporting the role of regulatory institutions in ensuring financial stability.

The GDP growth rate also demonstrates a robust negative effect on NPLs ($\beta = -0.134$, $p < 0.01$), reinforcing the notion that economic expansion improves the debt-servicing capacity of firms and households. As output and income levels rise, borrowers are better positioned to meet their financial obligations, thereby decreasing the likelihood of loan defaults.

Among the remaining variables, exchange rate volatility shows a positive and statistically significant impact on NPLs (β = +2.876, p = 0.020), highlighting the importance of currency stability. Exchange rate fluctuations, particularly in economies with substantial foreign-currency-denominated debt, can increase repayment burdens and contribute to higher NPLs.

The credit-to-deposit ratio is positive and marginally significant (β = +0.015, p ≈ 0.064), implying that banks with more aggressive lending relative to their deposit base may face heightened credit risks. This supports the view that rapid credit expansion should be monitored closely.

Two additional bank-specific characteristics—bank size (log of total assets) and return on assets (ROA)—exhibit negative and significant coefficients, indicating that larger and more profitable banks tend to maintain lower NPL ratios. These findings align with previous literature suggesting that well-capitalized and efficiently managed banks have stronger risk controls and better credit portfolios.

The R-squared value of the regression model is 0.689, suggesting that approximately 68.9% of the variation in NPLs can be explained by the model. This indicates a good explanatory power and reinforces the robustness of the regression results.

To strengthen the reliability of the findings, several diagnostic tests were conducted (see Table 3). The Hausman test produced a p-value below 0.05, confirming that the Fixed Effects (FE) model is the appropriate specification. This means that time-invariant individual effects (such as unobserved heterogeneity across banks or years) are correlated with the regressors and must be accounted for. The FE model captures these within-entity differences, allowing for more precise and unbiased coefficient estimates. As a result, the empirical strategy used in this study provides a sound basis for policy-oriented recommendations.

Table 3. Diagnostics tests

Test type	Result	Explanation
Hausman test	p < 0.05 (FE model is prefered)	Fixed Effects model is chosen
Multicollinearity (VIF)	All VIF < 10	Weak collinearity
Wooldridge test	P > 0.1 (no autocorrelation)	No autocerrelation
Ramsey RESET test	P > 0.05	Well-specified

To assess multicollinearity within the model, the Variance Inflation Factor (VIF) indicators were analyzed, and all variables were found to have VIF values below 10. This indicates that there is no strong linear correlation among the independent variables in the model. Consequently, the effect of each explanatory variable on the level of non-performing loans (NPLs) is consistently estimated without interference from other variables. These results enhance the internal validity of the model and demonstrate that the conclusions drawn are based on a robust foundation.

Additionally, to detect dynamic specification errors in the model, the Wooldridge test was conducted, with results showing a p-value greater than 0.1. This implies that no autocorrelation was detected in the panel data—i.e., past values do not significantly affect the current period's error terms. Furthermore, the Ramsey RESET test yielded a p-value greater than 0.05, suggesting that the model is correctly specified. In other words, no key variables have been omitted, nor is the functional form misspecified. These findings indicate that the final results and their economic interpretations are highly reliable and that the study's conclusions can serve as a solid basis for practical policy decisions.

CONCLUSION AND RECOMMENDATIONS

This study empirically assessed the impact of economic policy instruments and banks' financial indicators on the level of non-performing loans (NPLs) in Uzbekistan's banking sector. Based on the results of a regression model built using panel data, key influencing factors were identified, highlighting the need for diverse policy interventions. The analysis showed that monetary and fiscal policy, financial supervision, macroeconomic growth, exchange rate volatility, and bank-specific indicators significantly influence the volume of non-performing loans.

Firstly, monetary tightening (i.e., an increase in interest rates) leads to a reduction in the level of NPLs. This indicates that a cautious monetary policy can restrain excessive and risky lending practices. Therefore, the Central Bank should consider monetary policy not only as a tool for controlling inflation but also as an instrument to ensure financial stability.

Secondly, fiscal policy—particularly, an increase in the budget deficit—leads to a rise in NPL levels. This suggests that the government's financial discipline and reliance on debt have a direct impact on the

banking sector. Excessive government spending disrupts economic balance, reducing the reliability of banking operations. Hence, maintaining fiscal stability and keeping the budget deficit under control should be considered urgent tasks.

Thirdly, strengthening the financial supervision system helps reduce the level of NPLs. This confirms the critical role of effective banking oversight institutions, sound lending standards, and robust risk management systems. Therefore, in Uzbekistan's banking sector, it is essential to reinforce prudential regulations and enhance transparency and accountability in banks.

Fourthly, economic growth (GDP growth) contributes to the decline of NPLs. This implies that during periods of positive economic momentum, enterprises and individuals are better able to repay their debts on time. Thus, banking operations should be integrated within a broader macroeconomic context, where growth-stimulating measures also support financial stability.

Fifthly, sharp fluctuations in the exchange rate negatively affect banks' loan portfolios, posing particular risks for clients who have borrowed in foreign currency. From this perspective, ensuring exchange rate stability and developing hedging mechanisms to mitigate currency risk are of great importance.

Sixthly, bank size (total assets) and profitability (ROA) are found to have a negative impact on NPL levels. This implies that larger and more efficient banks are better at managing risks. Therefore, policies that strengthen banks' capital bases, enhance their technological capabilities, and support efficient resource utilization should be encouraged.

Seventhly, it was found that banks with high credit-to-deposit ratios tend to have slightly higher NPL levels. This suggests that such banks need to exercise greater caution in their lending practices and strengthen their analysis and monitoring mechanisms, particularly when dealing with high-risk sectors and clients.

In conclusion, based on the findings of this study, it is crucial to develop integrated policy measures that align monetary and fiscal policies, strengthen financial supervision, ensure macroeconomic stability, mitigate exchange rate risks, and improve risk management at the bank level in order to reduce NPLs in Uzbekistan's banking and financial sector. These steps are essential to fostering a stable banking system, promoting economic growth, and achieving greater financial inclusion.

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