

THE IMPORTANCE OF STRESS TESTING FOR CAPITAL ADEQUACY  
MANAGEMENT IN COMMERCIAL BANKS

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**Annotation:** This article examines the significance of stress testing as one of the key tools in capital adequacy management in the banking sector. The relevance of the topic is driven by the need to ensure the stability of commercial banks amid an unstable external environment and growing economic challenges. The paper analyses the main approaches to conducting stress testing, its objectives, methods, and its impact on managerial decision-making. Particular attention is paid to the necessity of implementing stress testing practices in Uzbek banks. The conclusion emphasizes the need for further development of stress testing as an element of strategic planning and enhancement of the financial stability of the national banking system.

**Keywords:** stress testing, banking capital, macroeconomic shocks, base and adverse scenarios, capital adequacy.

### Introduction

The modern banking system operates in a continuously changing macroeconomic environment, global market volatility, and increasing regulatory demands. In these conditions, ensuring the stability of banks and maintaining adequate capital levels becomes a priority task for both financial institutions and public authorities. One of the most effective tools to achieve this goal is stress testing—a forecasting method to assess the resilience of financial institutions to adverse economic scenarios.

In Uzbekistan, the importance of stress testing has gained renewed attention in the context of ongoing banking reforms. Notably, the Presidential Decree №5992 dated May 12, 2020, “About strategy of reforming the banking system of the Republic of Uzbekistan for 2020 – 2025” emphasizes the need to enhance the stability and efficiency of banks through the implementation of modern risk and capital adequacy management methods. According to this decree, the Central Bank is committed to strengthening financial stability monitoring and introducing international standards for solvency assessments, including regular stress testing [1].

Therefore, the need to analyse and implement stress testing in Uzbek banks is driven by both internal requirements and external regulatory demands. The relevance of the topic is particularly acute amid global economic risks, including inflationary fluctuations, geopolitical tensions, and the transition to digital banking technologies.

### Literature Review

Stress testing is recognized as a vital tool for assessing the resilience of financial institutions to various types of shocks—both macroeconomic and internal. Interest in this topic surged following the global financial crisis of 2007–2008, which revealed the insufficiency of traditional risk assessment methods in predicting systemic crises.

A significant contribution to the development of stress testing approaches was made by the Basel Committee on Banking Supervision, which published the "Principles for Sound Stress Testing Practices and Supervision" in 2009. This document underlines the necessity of integrating stress testing into the daily risk management processes and aligning national practices with international

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standards [2]. Additionally, the International Monetary Fund (IMF) and the World Bank utilize stress testing within the Financial Sector Assessment Program (FSAP) to evaluate the resilience of financial systems in developing countries by modeling various macroeconomic shock scenarios [3].

Researchers Ralph Kimball and Til Schuermann highlight the institutional aspects of stress testing, including the importance of management-level interpretation of test results. In their view, stress testing should not be a formal process but an integral part of strategic planning and corporate governance [4]. They emphasize that the effectiveness of stress testing directly depends on the quality of scenarios and the involvement of senior management.

In Uzbekistan, interest in the topic of stress testing has been growing gradually. Publications in local journals such as "Bank Amaliyoti," "Iqtisodiyot va Ta'lim," and "Moliyaviy Tahlil" confirm the topic's relevance amid ongoing banking system reforms. These articles discuss approaches to building stress scenarios, regulatory issues, and the practical application of tests in capital adequacy calculations. Thus, the literature review shows that stress testing is recognized in both academic and business environments as a critical mechanism for ensuring financial stability. For Uzbekistan, developing national approaches tailored to the domestic financial market remains particularly important, confirming the relevance and practical value of this research.

### Analyses and Results

Stress testing is a quantitative tool for assessing a bank's resilience to potential negative external and internal shocks. It models the impact of various adverse scenarios on a bank's financial condition—primarily its capital.

The objective of stress testing is to identify vulnerabilities in a bank's capital and liquidity structure and to enable proactive measures to ensure financial stability.

**Table 1**

**Steps in the Stress Testing Process [2]**

| Steps                  | Description  |
|------------------------|--|
| 1. Risk Identification | Identification of key risks: credit, market, operational and etc.        |
| 2. Scenario Design     | Development of shock-based and adverse macroeconomic scenarios           |
| 3. Impact Assessment   | Modeling the effect of each scenario on assets, liabilities, and capital |
| 4. Results Analysis    | Comparison of outcomes with capital adequacy requirements                |
| 5. Recommendations     | Formulation of strategies to strengthen capital and manage risks         |

Stress testing enables banks to:

- Assess capital adequacy under adverse conditions;
- Formulate recapitalization strategies;
- Adjust risk management policies;
- Refine internal reserve requirements;
- Improve liquidity management effectiveness.

International Experience shows that one of the most illustrative examples of successful stress testing implementation is the experience of the United States after the 2008 financial crisis. In 2009, the Federal Reserve launched the Supervisory Capital Assessment Program (SCAP) to evaluate the resilience of the country's largest banks under deteriorating economic conditions. Nineteen

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systemically important banks underwent stress testing, and those failing to meet capital adequacy requirements were required to recapitalize.

This program played a pivotal role in restoring trust in the U.S. banking system by:

- Identifying vulnerable institutions;
- Tightening capital management discipline;
- Improving coordination between regulators and banks.

Since then, stress testing has become an annual regulatory requirement under Dodd-Frank Act Stress Testing (DFAST) and Comprehensive Capital Analysis and Review (CCAR), enhancing the sector's resilience, including during the COVID-19 pandemic.

In 2022–2023, the Central Bank of Uzbekistan began implementing macro-level stress testing as part of systemic stability assessments.

Table 2

**Capital Adequacy Levels Under Different Macro Scenarios (%) [5]**

| Scenario       | Initial Level | Moderate Stress | Severe Stress |
|----------------|---------------|-----------------|---------------|
| Tier 1 Capital | 13.5%         | 10.2%           | 7.8%          |
| Total Capital  | 16.8%         | 12.5%           | 9.1%          |

This table demonstrates how the capital adequacy level of banks changes under varying levels of macroeconomic stress. If the total capital adequacy ratio initially stands at 16.8 percent, it declines to 12.5 percent under moderate stress, and further down to 9.1 percent under severe stress. The results show that under severe macroeconomic pressure, capital adequacy **remains above** the regulatory minimums:

- Minimum Tier 1 capital ratio – 10%;
- Minimum total capital ratio – 13% (CBU regulations, 2022).

As part of the stress-testing process conducted by the Central Bank of Uzbekistan, both a baseline and an adverse scenario were developed based on key macroeconomic indicators, such as real GDP growth, interest rates, and the exchange rate.

The baseline scenario reflects the most probable future state of the economy, assuming current economic trends continue.

The adverse scenario takes into account potential sharp internal and external economic shocks. In particular, it incorporates factors such as:

- the persistence of unfavorable geopolitical conditions,
- an increased risk of global recession,
- a decline in aggregate demand,
- and rising instability in the global financial system.

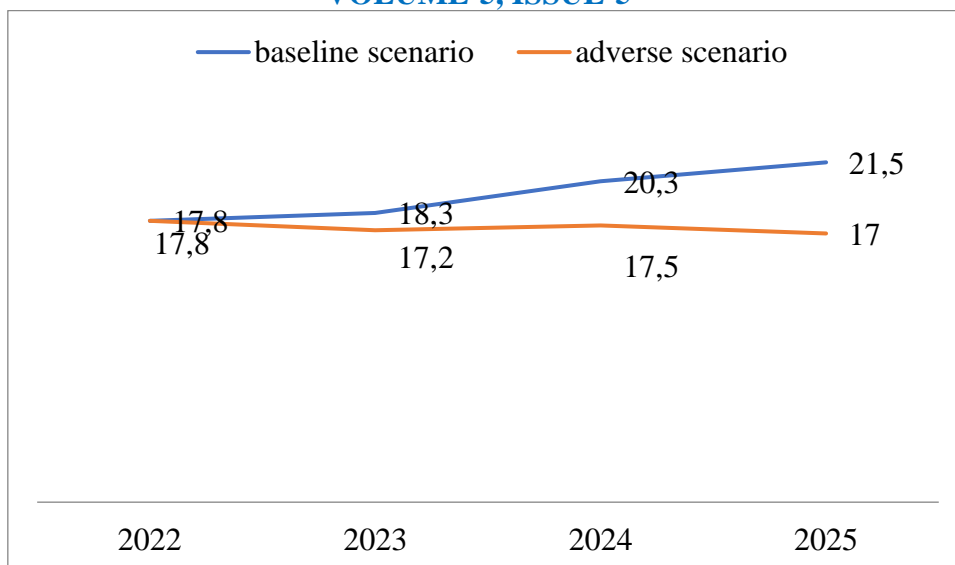


Figure 1. Capital Adequacy Ratio of the Banking Sector under Baseline and Adverse Scenarios [5]

According to the results of the stress test under both scenarios, the capital adequacy ratio of the banking system remains significantly above the minimum regulatory requirement (see Figure 1). By 2025, under the baseline scenario, the capital adequacy ratio of commercial banks may reach 21.5 percent. In the adverse scenario, this figure may decline to 17 percent. Nevertheless, this level still exceeds the minimum required thresholds.

### Conclusions and Proposals.

The conducted analysis confirms the importance of stress testing as a strategic tool in managing capital adequacy and ensuring the financial stability of commercial banks. Given the increasing complexity of economic risks, stress testing should be viewed not merely as a regulatory obligation but as a core function of effective risk governance.

International experience shows that regular and robust stress testing practices contribute to crisis prevention and reinforce public and investor trust in the banking system. In Uzbekistan, while the practice is still developing, the Central Bank's initiatives demonstrate significant progress toward aligning with global standards.

Further improvements should focus on:

- Strengthening methodological frameworks and model transparency;
- Integrating stress test results into risk-based supervision and capital planning;
- Updating scenarios in line with emerging risks;
- Building institutional capacity for ongoing stress testing practices.

These measures will help ensure that Uzbek commercial banks remain resilient in the face of macroeconomic and financial shocks, contributing to the soundness and sustainability of the national banking sector.

### List of used literature

1. Decree of the President of the Republic of Uzbekistan №5992 “About strategy of reforming the banking system of the Republic of Uzbekistan for 2020 – 2025” from 12.05.2020y.

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