

**EQUITY RISK MANAGEMENT IN COMMERCIAL BANKS OF UZBEKISTAN:
REGULATION AND AUTOMATION WAYS****O.F. Aliqoriev***PhD in Economics, Assoc. Prof., "Business Management and Entrepreneurship (MBA)" of the Higher School of Business and Entrepreneurship under the Cabinet of Ministers of the Republic of Uzbekistan***D.A.Djalilov***Head of Risk Management Service of JSC "YANGI BANK"; MA in Economics "Program on economic development", Ritsumeikan University; Master of "International Economic Relations", University of World Economy and Diplomacy*

Annotation: Equity risk is one of the key market risks faced by commercial banks. Changes in prices of securities can have a significant impact on the financial performance of banks and their sustainability. This article examines in detail the methods of equity risk management, regulatory requirements of the Central Bank of Uzbekistan (CBU), as well as modern approaches to automating the management of this risk. Particular attention is paid to the use of algorithmic trading, artificial intelligence (AI) and automated risk management systems (RMS), which help minimize potential losses of banks from fluctuations in the value of securities.

Introduction

Equity risk is associated with potential losses due to changes in prices of shares, bonds and other financial instruments included in the bank's investment portfolio. The level of this risk depends on market volatility, the structure of the investment portfolio and the bank's ability to effectively manage market changes [1].

With the development of the stock market of Uzbekistan, banks increasingly include securities in their assets, seeking to increase profitability and diversify sources of income. However, this process is associated with a number of problems: low liquidity of the country's stock market, limited availability of derivative instruments for hedging and the lack of a single automated system for managing stock risk [2]. In this regard, commercial banks need effective strategies for managing stock risk and integrating them into the bank's risk management system.

1. Methods of equity risk management**1.1 Portfolio diversification**

Diversification is one of the main methods of reducing equity risk. Its essence lies in the distribution of investments between different asset classes, economic sectors, regions and currencies, which reduces dependence on changes in the value of individual instruments. In the event of a fall in the value of one type of asset, other instruments can compensate for possible losses [3].

In the case of banks in Uzbekistan, diversification is carried out through the purchase of bonds, shares of state and private companies, as well as by placing funds on foreign markets. However, limited liquidity and the small size of the local stock market create obstacles to effective diversification [4].

1.2. VAR (Value - at - Risk) analysis

The VAR (Value at Risk) method allows estimation of the possible losses of an investment portfolio over a certain period with a given probability. It is calculated using the formula:

$$\text{VAR} = Z * \sqrt{\sigma} * t$$

Where:

- Z is the coefficient corresponding to the confidence level (for example, 1.65 for 95%);
- σ — standard deviation of asset returns;
- t - time horizon of risk measurement.

Banks use three main approaches to calculating VAR:

- **Historical modeling** based on past price movement data.
- **Monte Carlo model**, which involves simulating a variety of possible scenarios of market changes.
- The variance-covariance method, which takes into account the volatility of assets and the correlation between them [5].

This tool allows banks to assess the maximum level of equity risk and develop strategies to minimize it.

1.3 Hedging with Derivatives

Derivatives such as futures, options and swaps allow banks to hedge their investments against adverse market movements. For example, hedging using futures contracts can be expressed through the formula:

$$h^* = \frac{\rho\sigma_S}{\sigma_F}$$

Where:

- h^* : is optimal hedging ratio,
- ρ : is the correlation coefficient between the underlying asset and the futures,
- σ_S : is standard deviation of the spot price,
- σ_F : is the standard deviation of the futures price.

However, the derivatives market in Uzbekistan is in its infancy, and banks do not yet have wide opportunities to use these instruments. The introduction of derivatives and the development of a secondary securities market could significantly improve the efficiency of stock market risk management [6].

2. Regulation of stock market risk in Uzbekistan

The Central Bank of Uzbekistan has established a number of regulatory requirements for managing equity risk in commercial banks. According to the Regulations approved by the Central Bank of the Republic of Uzbekistan - “Regulations on the maximum amount of risk per borrower, including persons associated with the bank or a group of related borrowers” ,

“Regulations on the requirements for the risk management system in banks and banking groups”, banks are required to:

- Conduct regular assessment of market risk using the VAR method [7].
- Limit the maximum amount of investment in individual asset classes.
- Conduct stress testing of the securities portfolio at least once per quarter [8].
- Implement internal risk assessment models that take into account macroeconomic factors.

3. Automation of stock risk management

3.1 Algorithmic Trading and Machine Learning

Modern banks use algorithmic trading and machine learning to quickly respond to market changes. Algorithms allow for automatic analysis of quotes, identification of trends, and making trading decisions without human intervention, which reduces risks [9].

3.2. Automated risk management systems (RMS)

RMS systems provide real-time monitoring of stock market risk. They integrate with banking IT infrastructures, assess the impact of macroeconomic changes, and suggest adjustments to investment strategy [10].

3.3. Using Blockchain and Big Data

Blockchain and Big Data technologies allow for high-precision risk analysis. Blockchain provides transparency of transactions, and Big Data helps to predict market trends [11].

List of sources:

1. Hull, J. C. Options, Futures, and Other Derivatives. Pearson Education, 2022.
2. Basel Committee on Banking Supervision. International Convergence of Capital Measurement and Capital Standards. Bank for International Settlements, 2004.
3. Markowitz, H. Portfolio Selection. The Journal of Finance, 1952.
4. Sharpe, W. F. Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. The Journal of Finance, 1964.
5. Jorion, P. Value at Risk: The New Benchmark for Managing Financial Risk. McGraw-Hill, 2007.
6. Bodie, Z., Kane, A., Marcus, A. Investments. McGraw-Hill, 2021.
7. Central Bank of the Republic of Uzbekistan. Resolution No. 3283-1 dated 11/14/2024.
8. International Monetary Fund. Risk Management in the Banking Sector. Washington, DC, 2023.
9. Chan, E. Quantitative Trading. Wiley, 2020.
10. Basel Committee on Banking Supervision. Principles for Effective Risk Data Aggregation and Risk Reporting. Bank for International Settlements, 2013.
11. Tapscott, D. Blockchain Revolution. Penguin, 2016.
12. Aliqoriev O.F. Conceptual foundations of Islamic banking. International Journal of Economic Perspectives, 16 (12), December 2022. 20-31 Retrieved from <https://ijeponline.org/index.php/journal/article/view/449>.

13. Aliqoriev O.F. Prospects for the Introduction of Islamic Finance in Uzbekistan. American Journal of Business Management, Economics and Banking. 2023 Mar. 6 [cited 2023 Apr. 8]; 10:23-7. Available from: <https://americanjournal.org/index.php/ajbmeb/article/view/472>.
14. Aliqoriev O.F. Conceptual & Legal Framework of Islamic Finance. Web of Scientists and Scholars: Journal of Multidisciplinary Research. Volume 01, Issue 01, April 2023. IFSIJ JIF 7.995. <https://webofjournals.com>.
15. Aliqoriev O.F. Role of Islamic Development Bank Group in the Development of Islamic Banking in Uzbekistan. Volume 4, Issue 4 of ResearchJet Journal of Analysis and Inventions (RJAi) April, 2023. <https://reserchjet.academiascience.org>.
16. Aliqoriev O.F. Experience of Introducing Islamic Banking of Foreign Countries. American Journal of Interdisciplinary Research and Development. Volume 19, August, 2023. www.ajird.journalspark.org.
17. Aliqoriev O.F. Problems and Prospects For The Development Of The Introduction of Islamic Banking In Uzbekistan. Procedia of Theoretical and Applied Sciences. Volume 11 | Sep 2023. ISSN: 2795-5621 Available: <http://procedia.online/index.php/applied/index>.
18. Aliqoriev O.F. The Importance of Basic Financial Instruments Used in Islamic Banking. Texas Journal of Multidisciplinary Studies Peer Reviewed International Journal. Volume 23 (2023). ISSN: 2770-0003. <https://zienjournals.com/index.php/tjm/article/view/4351>.
19. Djalilov D.A., Aliqoriev O.F. Currency risk management using VAR analysis in commercial banks of Uzbekistan // Journal of Uzbekistan's Development and Research (JUDR). Vol. 1 No. 1 (2025): <https://ijournal.uz/index.php/judr>.
20. Aliqoriev O.F., Abdurakhmanov R. A . Iqtisodiyot tarmoqlari kesimida muammoli creditlarni kaitmaslik darajalarini tagolili // Journal of Uzbekistan's Development and Research (JUDR). Vol. 1 No. 1 (2025): <https://ijournal.uz/index.php/judr>.
21. Aliqoriev O.F., Abdurakhmanov R. A . Iqtisodiyot tarmoqlari kesimida muammoli creditlarni kaitmaslik darajalarini tagolili // The Multidisciplinary Journal of Science and Technology. Volume-5, Issue-1 <http://mjstjournal.com/index.php/mjst>.