

институциональный переход от формального администрирования к превентивному цифровому надзору. Реализация предложенных мер позволит повысить прозрачность финансового рынка, снизить системные риски и обеспечить устойчивость национальной финансовой системы в условиях цифровой экономики.

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ARTIFICIAL INTELLIGENCE TOOLS IN INVESTMENT DECISION-MAKING: PROSPECTS AND RISKS FOR UZBEKISTAN'S FINANCIAL MARKET

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Abstract. *This paper examines the role of artificial intelligence (AI) tools in modern investment decision-making. The study analyzes key AI methodologies — machine learning, deep learning, and natural language processing — and their practical applications in global financial markets. The prospects and risks of AI adoption for Uzbekistan's developing financial market are assessed in light of the "Uzbekistan-2030" Strategy, with policy recommendations presented for financial regulators and market participants.*

Key words: *artificial intelligence, machine learning, investment decisions, algorithmic trading, robo-advisory, financial technologies, risk management, Uzbekistan financial market, ESG investing.*

The global financial system is undergoing a fundamental transformation driven by artificial intelligence. AI-powered systems now serve as the primary engines for trading, portfolio construction, and risk evaluation at the world's largest financial institutions. AI-driven algorithmic trading accounts for over 60% of daily equity trading volume on major U.S. stock exchanges, and global investment in AI for financial services surpassed \$35 billion in 2023²¹⁴. Robo-advisory platforms manage assets exceeding \$2.5 trillion worldwide, serving millions of retail investors who previously lacked access to professional portfolio management. For Uzbekistan, this transformation is directly relevant: the "Uzbekistan-2030" Strategy envisions a modern, technology-driven financial system, and the strategic adoption of AI tools could serve as a powerful accelerant toward this goal.

Artificial intelligence in investment relies on several core methodological approaches. Machine learning algorithms identify statistical patterns in large historical datasets to forecast future market behavior. Supervised learning methods — regression models, support vector machines, and gradient boosting — are widely used for price prediction and credit scoring. In contrast, unsupervised learning techniques uncover hidden market structures undetectable through traditional analysis²¹⁵. Deep learning neural networks process complex, non-linear patterns in high-dimensional financial data, with Long Short-Term Memory networks proving particularly effective for analyzing time-series data such as stock prices and trading volumes²¹⁶. Natural language processing enables AI systems to extract market-relevant insights from unstructured text — earnings call transcripts, central bank statements, news articles, and social media posts — providing real-time sentiment signals that complement conventional quantitative indicators²¹⁷.

These methodologies underpin a wide range of practical investment applications. Algorithmic trading systems execute instructions at high speed, exploiting fleeting price discrepancies and continuously refining strategies based on real-time market feedback, significantly increasing liquidity while reducing transaction costs. Robo-advisory platforms automatically construct and rebalance diversified portfolios tailored to individual investor risk profiles, democratizing access to professional investment management. This application is especially significant for Uzbekistan, where access to qualified financial advisors remains limited and financial literacy is a recognized national policy priority. AI-based credit scoring models use alternative data sources — mobile phone usage patterns, utility payment histories, and e-commerce records — to assess

²¹⁴ MarketsandMarkets. Artificial Intelligence in Fintech Market – Global Forecast to 2030. MarketsandMarkets Research, 2023.

²¹⁵ Hastie, T., Tibshirani, R., & Friedman, J. *The Elements of Statistical Learning* (2nd ed.). Springer, 2009.

²¹⁶ Vaswani, A., et al. Attention Is All You Need. *Advances in Neural Information Processing Systems*, 30, 5998–6008, 2017.

²¹⁷ Loughran, T., & McDonald, B. Textual Analysis in Accounting and Finance: A Survey. *Journal of Accounting Research*, 54(4), 1187–1230, 2016.

creditworthiness for borrowers who lack formal credit histories, directly addressing the needs of Uzbekistan's large underbanked population²¹⁸.

The integration of AI tools with ESG (Environmental, Social, and Governance) investing principles represents another major application area. With ESG-aligned assets under management globally exceeding \$35 trillion, AI tools that can automatically extract and classify sustainability-relevant information from large volumes of corporate disclosure documents have become indispensable.

Within the "Uzbekistan – 2030" framework, which emphasizes sustainable and responsible economic development, AI-assisted ESG integration in the capital market could attract a new class of internationally oriented investors and support the country's transition toward a greener economy.

The adoption of AI investment tools offers significant opportunities for the development of Uzbekistan's financial market. AI systems can enhance market efficiency by reducing information asymmetries and improving price discovery — a benefit of particular value in a market that is still maturing. Low-cost AI-powered investment platforms can broaden financial market participation among retail investors, supporting the financial inclusion objectives of the national development agenda. At the same time, the digital and data infrastructure required to deploy AI effectively — standardized financial reporting, centralized data repositories, real-time market data feeds — would generate positive externalities for the broader financial ecosystem, reinforcing Uzbekistan's wider digital transformation goals²¹⁹.

However, AI investment tools also carry substantial risks that must be carefully managed. Models trained on historical data are inherently backward-looking and may fail under novel market conditions; the global financial crisis of 2007–2008, partly caused by overreliance on quantitative models, remains a cautionary example²²⁰. When many market participants deploy similar AI systems, correlated behavior can amplify volatility and trigger systemic crises — as illustrated by the 2010 Flash Crash, in which automated sell cascades briefly erased nearly \$1 trillion in market capitalization. Many high-performing AI models also operate as "black boxes," producing predictions without transparent reasoning, complicating regulatory oversight and accountability. For Uzbekistan, these challenges are compounded by limited digital infrastructure, a shortage of AI specialists, shallow historical financial datasets, and an as-yet undeveloped regulatory framework for AI in finance²²¹.

In view of these prospects and risks, a strategically sequenced approach to AI adoption is essential for Uzbekistan. The Agency for the Development of the Capital Market of Uzbekistan should establish a dedicated regulatory framework for AI in finance, drawing on international best practices, including the European

²¹⁸ Cao, L. AI in Finance: Challenges, Techniques and Opportunities. *ACM Computing Surveys*, 55(3), 1–38, 2022.

²¹⁹ Agency for the Development of the Capital Market of the Republic of Uzbekistan. *Annual Report on the Development of the Financial Market*. Tashkent, 2024.

²²⁰ Kirilenko, A., Kyle, A.S., Samadi, M., & Tuzun, T. The Flash Crash. *The Journal of Finance*, 72(3), 967–998, 2017.

²²¹ Bookstaber, R. *A Demon of Our Own Design*. John Wiley & Sons, 2007.

Union's AI Act. Investment in financial data infrastructure should be treated as a national priority. A phased rollout — beginning with lower-risk applications such as fraud detection and robo-advisory services before advancing to more complex algorithmic trading systems — would allow regulatory and institutional capacity to develop in parallel with technological deployment. Building domestic expertise in AI and data science through targeted educational programs and international partnerships is equally critical. Uzbekistan's goal should not simply be to adopt AI investment tools, but to do so in a responsible, inclusive, and fully aligned manner with the objectives of the "Uzbekistan-2030" Strategy²²².

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РЕАЛИЗАЦИЯ КОНЦЕПЦИИ ОТВЕТСТВЕННОГО ПОТРЕБЛЕНИЯ И ПРОИЗВОДСТВА В МОДЕЛИ УСТОЙЧИВОГО РАЗВИТИЯ

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Введение. Новые реалии требуют от органов государственной власти различных уровней пересмотра традиционных подходов к формированию и реализации государственной финансовой политики, ключевыми элементами которой являются гибкость, социальная составляющая,

²²² Ahmedov, B. Digital Transformation of the Financial Sector of Uzbekistan. Iqtisodiy taraqqiyot va tahlil, 2(1), 14–22, 2024.