RISK MANAGEMENT IN REAL ESTATE INVESTMENTS: HOW AI CAN MINIMIZE LOSSES

Shomurodova Muharram Xikmatilla qizi [274]

Murotov Akmal Xakimovich [275]

Annotatsiya: *Artificial Intelligence (AI) is transforming the financial sector, particularly in the domains of risk management and investment decision-making. This master's thesis studies the risks related to real estate investing and how these risks can be minimized. It also discusses the decision-making processes of real estate investing and investment strategies. It is important to manage risks and be aware of them in advance. Before making an investment decision, it is essential to find out what kinds of risks are associated with the investment target and the business in general and how the risks can be reduced.*

Keywords: *Real estate investment, artificial intelligence, leadership, technology, proptech, machine learning, organizational design, strategic planning.*

The investment finance industry is in a constant state of evolution, marked by a relentless drive to integrate cutting edge technologies such as artificial intelligence (AI), Machine Learning (ML), and Big Data Analytics (BDA) into financial services (banking, investment management, insurance, real estate, etc.) industries. This research identifies the profound impact of AI/ML technologies on companies, real estate investment companies for example, and explores emerging risks associated with its adoption.

It is imperative to confront the challenges that accompany this AI revolution, particularly in terms of new risks. These newfound risks encompass a wide spectrum, including concerns related to: data privacy, algorithmic bias, regulatory compliance, ethical considerations, and the establishment of user trust [4]. Addressing these challenges is essential to fully unlock the potential of AI in the domains of fintech, proptech, and beyond. The successful integration of AI into economic and industry processes relies on ethical, moral, responsible, and accountable approaches that balances the benefits with the risks. For example, the dynamic intersection of fintech, proptech, etc. and AI holds immense promise, but also demands vigilance and responsibility. By navigating these challenges, companies can harness the transformative power of AI, while ensuring its adoption remains ethical and beneficial to the financial services industry, and the economy at large.

The incorporation of AI/Natural Language Processing (NLP) layers into real estate investment models allows for companies to create sophisticated tools for

[274] 1st year master's student "Foreign Economic Activity", University of World Economy and Diplomacy
[275]Senior Lecturer of Department of "International Finance and Investments, University of World Economy and Diplomacy

Return on Investment (ROI) optimization. These tools offer predictive insights and reveal intricate correlations among data points, resulting in amplified revenue streams for brokers, investment managers, and service providers. Moreover, they drive substantial cost reductions by streamlining workflow processes. For example, an NLP application involves tracking hyper-local real estate submarket data activity surrounding a specific property or portfolio. AI can identify correlations between local market factors such as the impact of conference events or other relevant announcements, and the property value. Such an application, equipped with NLP capabilities, can automatically optimize effective rent based on real-time market shifts, ensuring asking rents are always aligned with current market dynamics.

Predictive analytics involves using statistical methods and machine learning techniques to forecast future financial events based on historical data. Several studies have shown the effectiveness of predictive analytics in improving portfolio returns and risk management:

• Time-Series Analysis and Machine Learning: The application of time-series analysis, such as autoregressive integrated moving average (ARIMA) models, in financial forecasting has a long history. However, traditional time-series models often lack the flexibility to capture the nonlinear dynamics of financial markets. As a result, machine learning models, particularly deep learning approaches like recurrent neural networks (RNNs) and long short-term memory (LSTM) networks, have gained traction in predicting asset prices and market trends. Studies by demonstrate that LSTM networks outperform traditional models in predicting stock price movement and reducing prediction errors, thereby aiding in portfolio construction and risk management.

• Sentiment Analysis for Market Forecasting: Sentiment analysis, a subset of predictive analytics, has proven to be a valuable tool for assessing market sentiment based on news articles, social media posts, and financial reports. According to, there is a significant correlation between social media sentiment and stock price movement, suggesting that incorporating sentiment data into predictive models can enhance the accuracy of portfolio management strategies. These findings have led to the development of predictive models that incorporate sentiment analysis as a factor in asset selection and risk assessment

• Event-Driven Forecasting Models: Another promising area in predictive analytics is event-driven forecasting, which analyzes market reactions to specific events such as economic announcements, geopolitical shifts, or corporate earnings reports. Studies by suggest that incorporating event-driven analytics improves the responsiveness of portfolio models to sudden market changes. By predicting the impact of such events on asset prices, portfolio managers can optimize asset allocation and reduce exposure to high-volatility assets during uncertain periods.

The success of predictive analytics in portfolio management depends heavily on the underlying data infrastructure, which must be capable of handling large-scale, real-time data flows. Scalable data modeling techniques provide the structural

foundation necessary to integrate and analyze diverse data types efficiently: • Big Data Architectures: Big data frameworks such as Apache Hadoop and Apache Spark have become essential for processing vast amounts of financial data. A study by [36] emphasizes the importance of big data in enabling more accurate and timely financial analyses. By using distributed computing, these systems can process complex datasets at scale, improving the speed and accuracy of predictive analytics in portfolio management.

Data Warehousing and ETL Pipelines: Efficient data warehousing and Extract, Transform, Load (ETL) processes are critical for managing data from multiple sources. In portfolio management, data integration from diverse sources—such as stock prices, economic indicators, and market sentiment—requires welldesigned ETL processes to ensure data quality and reliability.

• Real-Time Data Processing with Stream Processing: Financial markets operate in real time, necessitating data processing systems that can handle continuous data streams. Stream processing technologies, like Apache Kafka and Spark Streaming, allow financial institutions to ingest and analyze real-time data, which is crucial for time-sensitive decisions. Real-time processing improves portfolio performance by enabling managers to react to market events as they occur, rather than relying on delayed data analysis.

To maximize the benefits of predictive analytics and scalable data modeling, integrated approaches that combine both elements are increasingly popular. Studies have highlighted the synergy between predictive models and scalable infrastructure in financial portfolio management:

• Hybrid AI Models for Portfolio Optimization: Hybrid models that combine predictive analytics with portfolio optimization algorithms, such as mean-variance optimization and Black-Litterman models, have shown promising results. According to, hybrid models that incorporate machine learning predictions can generate more accurate risk-return profiles, leading to portfolios that are better balanced for different market conditions.

• Distributed Computing for Portfolio Risk Assessment: With the growth in computing power and distributed data storage, financial institutions can now process and analyze enormous amounts of market data for risk assessment. Distributed systems make it feasible to run complex models that assess systemic risk and portfolio diversification in real-time. In their study, distributed computing systems reduce computational overhead and provide more reliable risk assessments, enhancing the decision-making process in portfolio management.

• Modeling Market Volatility and Asset Correlations: Predictive analytics techniques are also applied to model and predict market volatility and asset correlations, which are essential for diversification strategies. With machine learning models such as convolutional neural networks (CNNs) and random forests, researchers have been able to model complex interdependencies among assets.

Studies by illustrate that volatility prediction and asset correlation models improve the accuracy of risk assessment in portfolio construction.

The real estate industry's evolution into a tech-driven force is underway, and firms must adapt to thrive in this new era. Real estate companies are advised to be cognizant of the pace of innovation and operate more like technology firms in order to stay competitive. Additionally, while implementing AI tools, it is recommended that companies invest in programs that address workforce self-leadership and communication skills development to foster better productivity and team leadership.

By embracing innovation, restructuring, and fostering a culture of agility, real estate companies can not only keep pace with change but also lead the way in shaping the future of the industry. It is important for companies to address the array of risks associated with AI integration – loss of jobs, ROI uncertainty, technical challenges, dependency on AI – by exercising a nuanced approach, tailored to the unique needs and circumstances of each organization. It is recommended that development and implementation of solutions should be a collaborative effort, drawing input from employees, advocates, and individuals with firsthand experience of AI use. The ongoing evaluation and adaptation of these solutions are paramount to ensuring their efficacy in facilitating seamless AI integration into everyday operations.

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АНАЛИЗ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ В ПРАКТИКЕ НАЛОГОВОГО БЮДЖЕТИРОВАНИЯ

Абдусаломова Гулчеҳра Мирзо қизи [276]

Введение

В сферах государственного управления, промышленности, банковской деятельности и пр. ежедневно генерируется и аккумулируется огромное количество информации и данных. Появившиеся новые возможности технологических и цифровых инноваций непосредственно влияют на многие сферы деятельности экономики. При этом ключевым преимуществом цифровизации экономики являются возможности автоматического управления экономической системой, способствующие значительному росту эффективности управления хозяйственной деятельностью на макро-, мезо- и микроуровнях.

В сложившихся условиях возникает необходимость обеспечения соответствующей благоприятной среды, разработки и применения новых подходов к государственному управлению и регулированию, в том числе в области налогов и налогообложения, где в целях оптимизации налоговых доходов повышается эффективность налогового администрирования и контроля, а также борьбы с уклонением от уплаты налогов. Федеральная налоговая служба Российской Федерации (далее – ФНС РФ) в соответствии с выделенными целями внедряет в свою работу новейшие инструменты налогового администрирования, параллельно оптимизирующие работу налоговых органов.

Методология

Методологическую основу исследования составили труды российских и узбекских ученых, посвященные проблемам налогового администрирования в контексте цифрового взаимодействия государства в лице налоговых органов и

[276] Магистрантка СОП ТГЭУ-УГНТУ, abdusalomovagulchehra0@gmail.com, (orcid. 0009-0001-4621-3058)