

Guest editorial: Special issue: Applications of artificial intelligence and machine learning in business, finance and economics

Artificial intelligence (AI) is the simulation of intelligence by machines. Machine learning (ML) is a branch of AI that focuses on the use of data by algorithms to learn and extract valuable information that enables problem-solving and decision-making. In the contemporary landscape of business, finance and economics, the integration of AI and ML technologies has emerged as a pivotal force driving innovation, efficiency and strategic decision-making.

For instance, the intersection of AI and ML with business operations is reshaping traditional paradigms across various sectors. From streamlining processes and enhancing customer experiences, to optimizing supply chains and predicting market trends, the deployment of intelligent algorithms is revolutionizing how organizations operate and even the way we interpret market dynamics. In the realm of finance, AI and ML are catalyzing significant advancements in risk management, portfolio optimization and algorithmic trading. These technologies enable financial institutions to assess creditworthiness, detect fraudulent activities and automate routine tasks with heightened accuracy and efficiency. In economics, AI and ML methodologies are unlocking new frontiers in research, policy formulation and market analysis. Researchers leverage these tools to analyze complex economic phenomena, forecast macroeconomic indicators and simulate policy interventions with unprecedented granularity and accuracy.

The continued advancement of AI and ML technologies holds immense promise for reshaping the future landscape of business, finance and economics. This special issue (SI) aims to present the latest developments and innovative ways to use data analysis and learning methods for practical decisions and analyses in managerial tasks. The key objective is to provide a forum to stimulate the continuing effort in the application of AI and ML approaches to solve problems in business, finance and management. The SI has attracted 23 papers covering distinct applications of AI and ML. After rounds of reviews by national and international experts, seven papers were selected for this special issue. We briefly summarize these curated papers below.

The work “Market efficiency assessment for multiple exchanges of cryptocurrencies” by [Souza and Carvalho \(2024\)](#) analyzes the efficient market hypothesis (EMH) of cryptocurrencies on multiple platforms. The EMH was evaluated in a multivariate way using a traditional econometric modeling framework: vector autoregression. The findings gave evidence of Granger causality between cryptocurrencies on all exchanges.



dos Santos, Fávero, Brugni, and Serra (2024) discussed how markets have developed over time, considering the adaptive market hypothesis. The paper “Adaptive markets hypothesis and economic-institutional environment: a cross-country analysis” used the multi-level modeling approach for the Hurst exponent – as an informational efficiency metric – computed for 50 different countries. Results suggest that markets follow a cyclical pattern of efficiency/inefficiency.

Still in the realm of financial markets, the paper by Pereira Alves de Abreu and Iquiapaza (2024), entitled “Diversification with international assets and cryptocurrencies using Black-Litterman,” studied the performance of Black-Litterman portfolios composed of national, international and cryptocurrency assets for investors in an emerging market. The suggested approach uses an estimation procedure that simulates investor forecasts based on technical analysis. The procedure includes the use of time series modeling techniques, linear regression and support vector regression. Empirical analyses have shown that the proposed method appears to be a potential strategy for investors.

Peng and Souza (2024) have contributed to the paper entitled “Machine learning methods for financial forecasting and trading profitability: Evidence during the Russia–Ukraine war.” The work evaluated the potential of support vector machines for stock price movement direction forecasting. Computational experiments used data before and after the deflagration of the Russia–Ukraine war. Results indicate the potential of the machine learning approach – particularly for the period after the war, outperforming the buy-and-hold strategy in terms of profitability.

The papers also addressed applications of AI and ML in economics. In “Sentiment and economic activity in Brazil”, by Marschner and Ceretta (2024), a non-linear autoregressive distributed lag model is used to evaluate how sentiment affects economic activity in the country. Experiments reveal that sentiment does affect economic activity through consumption and investment. The authors also found that the effect of shocks of optimism and pessimism on economic activity is asymmetric.

Nery-da-Silva, Henrique de Araujo, and de Souza Meirelles (2024), with the paper entitled “Contributions to the segmentation of e-commerce nonusers: clustering the reasons not to shop online,” concerns market segmentation. They used clustering analysis to investigate whether Brazilian e-commerce non-users all have the same reasons not to purchase online or if different behavior patterns might lead them to cluster into groups. Results suggest there are three clusters of e-commerce nonusers: (1) quite reluctant members; (2) disbelief in e-commerce members and (3) members who must see a product to believe it.

In “Users’ trust in black-box machine learning algorithms”, by Nakashima, Mantovani, and Machado Junior (2024), the objective was to investigate whether professional data analysts’ trust in black-box systems is increased by explainability artifacts. The authors constructed a black-box model based on artificial neural networks and on local interpretable model-agnostic explanation algorithms for local explainability artifact estimation. Based on data analysts’ trust in the black-box model outcomes, interviews suggest that the nature and complexity of the problem influence the users’ perceptions.

The SI papers illustrate the different applications of AI and ML in business, economics and finance fields. They highlight the capacity of AI and ML techniques for solving problems and extracting information across various management areas. We hope that the SI papers will inspire researchers and foster advances in modeling, development and application of AI and ML methods in business and applied social sciences. We thank the Editor-in-Chief of REGE, Professor Adriana Marotti, for her encouragement, trust in the potential of the special issue and invaluable and continued support. We extend our gratitude to all authors for their contributions to this special issue. Additionally, we would like to thank the reviewers for their diligent and essential work, which is crucial to ensuring the quality of this unique paper collection.

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