

At the current stage of economic development, one of the sought-after tasks of investors, companies and politicians is the analysis, modeling and obtaining forecast values of the share price of selected companies.

The stock market is a complex system influenced by a wide range of factors, among which the performance of companies, economic indicators and investor sentiment play an important role. That is why forecasting the future behavior of the stock market becomes an indispensable stage necessary for making the right investment decisions. The stochastic nature of changes in stock quotes and the presence of implicit trends leads to the need to use time series analysis methods to solve the problems of modeling and forecasting the price dynamics of the stock market.

In this paper the existing approaches of time series analysis are reviewed. The following mathematical models of stock market price dynamics are considered, built and experimentally investigated based on the quotation data of individual real shares taken from open sources:

- autoregressive moving average model (ARMA) assumes that the price at any moment in time is affected by both its own past values and external factors [1];
- autoregressive integrated moving average model (ARIMA) takes into account seasonality and trends present in the data;
- vector autoregression (VAR) allows you to evaluate the joint behavior of several time series and helps to identify cause-and-effect relationships between variables [2].

Recent research has focused on combining the capabilities of artificial neural networks with the above models to improve forecasting accuracy [3].

Analysis of the work results confirms that the obtained models can be effectively used as a tool for modeling and forecasting market dynamics.

References (translated):

1. Peter J. Brockwell, Richard A. Davis – Introduction to Time Series and Forecasting. – 2016. – P. 73-96.
2. George E. P. Box, Gwilym M. Jenkins – Time Series Analysis: Forecasting and Control (Wiley Series in Probability and Statistics). – 2015. – P. 509-524.
3. «Exploring the LSTM Neural Network Model». 2022. [Electronic source]: Access mode <https://towardsdatascience.com/exploring-the-lstm-neural-network-model-for-time-series-8b7685aa8cf> – Date of application: 31.03.2023.