

ABSTRACT

Master's Thesis: 93 pages, 11 images, 3 tables, 7 attachments, 50 references.

Research rationale. Due to the rapid development of information technologies, it becomes possible to analyze a large amount of information in a few seconds, build complex mathematical models and solve problems of multi-criteria optimization. Researchers, who are involved in cyclical economic development, began to theorize, assuming that tracking of the number's trends in economic would clarify and predict periods of recovery and decline. One of the objects of study is stock market. Creating systems for financial market analysis and predictive models development with other problems involves solving of two fundamental problems: identification and determination of required and sufficient parameters for assessing the state of the market, as well as target functions, which includes, selection of criteria for the actions' efficacy. Formalization is the simulation of the behavior of a system consisted of heterogeneous components. And it requires the use of a single metric for their description; dimensional problem – the desire to consider in the model as many indicators and evaluation criteria as possible can lead to a practical impossibility due to computational complexity.

Connection of research with scientific programs, plans, topics. The work was performed at the the department of Computer-Aided Management And Data Processing Systems (ASOIU) of the National Technical University of Ukraine "Kyiv Polytechnic Institute. Igor Sikorsky" within the frame of the topic "Information support of the interaction of IT education and IT industry in Ukraine" (State registration number 0117U000917).

The goal of the research is to identify the patterns in the indicators of market stock quotes, to determinate the direction in which the market will move.

Research tasks:

- to characterize existing methods of market quotation analysis;

- to evaluate available methods of market quotation analysis;
- to determine the efficiency of existing market quotation analysis methods;
- to identify features to create a new method for analyzing market quotes;
- to develop a new method for market quotation analysis;
- to determine the effectiveness of the method.

Object of research – quotations on the stock market, which are presented in the form of a time series.

Subject of research – methods of analysis of market quotations.

Research involves **methods** based on the methods of the theory of artificial neural networks, evolutionary calculations, discrete mathematics, the fundamentals provisions of the theory of probability and mathematical statistics, genetic algorithm.

The scientific novelty of the study. The algorithm is developed, which allows to determine the parameters of the configuration of effective neural network for prediction of financial time series.

Publications. The following publications were produced from described research: “An overview of methods for financial time series analysis”; “Comparative analysis of forecasting methods of stationary and non-stationary time series”; “Application of the genetic algorithm to determine the effective configuration of artificial neural networks”.

TIME SERIES, INTELLECTUAL ANALYSIS OF DATA, SELECTION METHODS FOR INFORMATIVE DATA, NEURAL NETWORKS, GENETIC ALGORITHM.