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Taxonomy of Prediction Techniques and a Review of Stock Market Analysis

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ABSTRACT:

The topic of exchange prediction continues to interest many analysts and scholars. According to common ideas, trying to predict the stock market is futile because it is largely a stochastic process. Because there are so many variables involved, forecasting stock costs can be challenging in and of itself. The market operates like a mechanical device in the short term, but in the long run, it acts like a balance, therefore it is possible to forecast market movements over a long period of time. One area that has great potential is the use of machine learning techniques and alternative algorithms for stock worth analysis and prognostication. First, we provide a brief summary of exchanges and taxonomy in this study.

1. Introduction

One of the most intriguing modern innovations is the financial market. They must have a significant impact on a variety of fields, including business, education, employment, technology, and the economy (Hiransha et al. 2018). Over time, models of stock price movements have captured the attention of both investors and researchers (Fama 1995). The analysis of stock market movements and price fluctuations is extremely challenging, nevertheless, due to the market's dynamic, non-linear, non-stationary, non-parametric, noisy, and chaotic nature (AbuMostafa and Atiya 1996). According to Zhong and Enke (2017), a number of intricately related elements, such as economic, political, psychological, and corporate variables, negatively affect stock markets. There are two primary methods for examining financial markets: technical analysis and fundamental analysis (Park and Irwin 2007; Nguyen et al. 2015). Investors have employed these two primary strategies to make decisions on the financial markets: taking positions in equities and offering high-return, low-risk commodities (Arévalo et al. 2017). Hu et al. (2015) support three key points by emphasising factor analysis in particular: I macroeconomic analysis, such as looking at the GDP and the Consumer Price Index (CPI); evaluating how changes in the economy may affect long-term corporate earnings. (ii) transaction analysis to evaluate the worth of the entity's supported commercial position and prospects; and (iii) company analysis. To determine internal prices, examine the business's existing activities and financial position. The evaluation for elemental analysis is entirely different. To better understand prices, a common growth approximation technique compares stock A to alternative stocks in the same class. H.

2. A taxonomy of approaches to stock market analysis

The recent advances available in analytics and prediction fall into four categories: statistics, pattern recognition, machine learning (ML), and sentiment analysis. These classes largely fall under the broader class of technical analysis, however, there are machine learning techniques that combine additional broader layers of technical analysis with fundamental analysis methods to predict the market for those have scholarships. These techniques have achieved quality and have shown promising results in the field of security analysis in recent times..
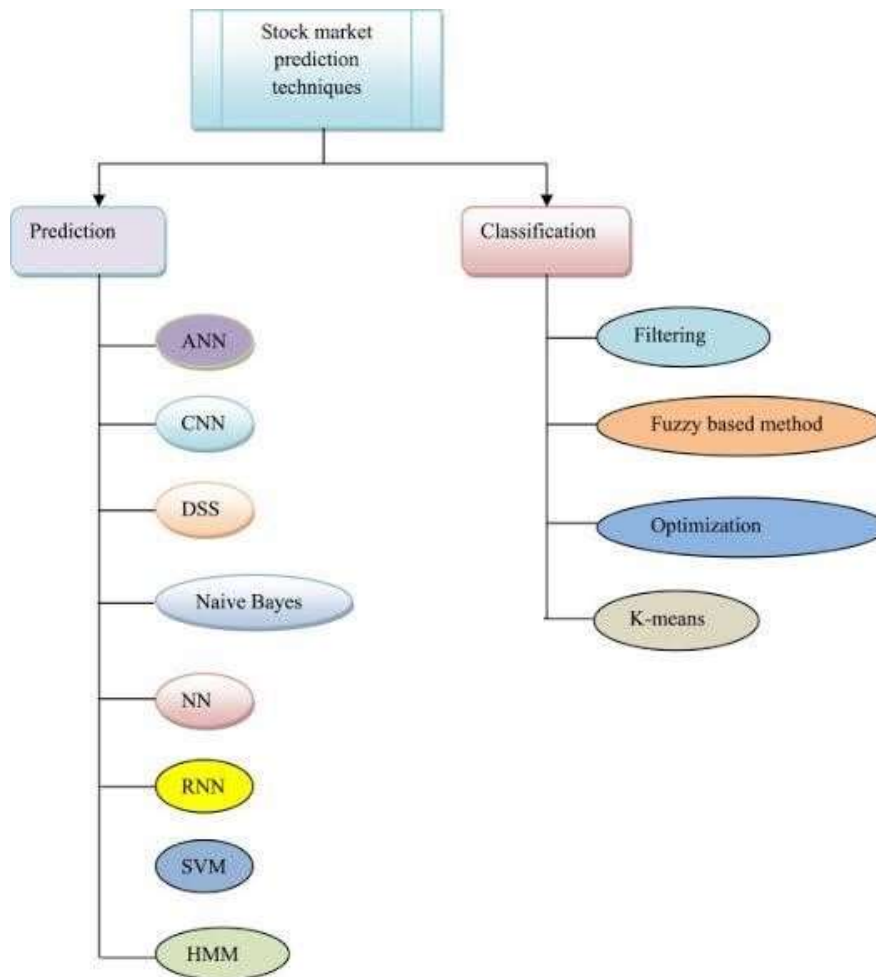
Prior to the development of machine learning methods, it was possible to analyse and forecast stock prices using applied math methods that frequently assumed linearity, stationarity, and normalcy. A statistic in stock market analysis could be a recorded collection of observations such as daily sales totals and stock prices (Fu et al. 2005). According to Zhong and Enke (2017), the Auto-Regressive Moving Average (ARMA), the Auto-Regressive Integrated Moving Average (ARIMA), the Generalized Autoregressive Conditional Heteroskedastic (GARCH) volatility, and the Smooth Transition Autoregressive (STAR) model are a group of applied math techniques that fall under the category of univariate analysis because they use your time series as input variables. It's possible that the ARIMA model is a widely utilised tool for stock market analysis (Hiransha et al. 2018).

3. Problems and unresolved issues

Regarding live testing, the majority of the literature on stock analysis and prediction asserts that the suggested approaches are applied in real time to generate profits in the securities market. It's a big claim to make since while an equation may work well when backtested in controlled settings, live testing poses the most obstacle because of the abundance of things like value variations, silent news, and noise that might occur. The Knight Capital Tragedy1, in which the company lost 440 million, is one such instance. In light of this, it would be wise to know how some of the most popular stock analysis approaches incorporate real or simulated situations.

Conclusions

Financial markets provide a unique platform for trading and investment, allowing trades to be completed from any device that can connect to the internet. People now have the opportunity to have many ways to make their investments grow thanks to the advent of stock exchanges. Not only that, but it also gave rise to many types of funds including mutual funds, hedge funds, and index funds so that people and organisations may invest money according to their appetite for risk. Most governments make an investment in the stock market with a portion of their aid, employment, or retirement money in order to increase returns for all parties. Online trading platforms have already completely changed how people buy and sell stocks. Money markets have quickly developed into a strong, integrated global marketplace. These developments create new opportunities, and as a result, the techniques of knowledge science offer many benefits. However, they also bring about a whole new set of difficulties. In this paper, we have a tendency to propose a taxonomy of machine approaches to stock exchange analysis and prediction, present a close literature study of the progressive algorithms and methods that are typically applied to stock exchange prediction, and discuss a number of the ongoing challenges in this field that call for more attention and offer opportunities for further

development and analysis. Unlike earlier systems, modern stock markets use a variety of technologies, including machine learning, expert systems, and massive databases that interact with one another to support more up-to-date decisions.

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