Chapter 10

Bombay Stock Exchange of India: Patterns and Trends Prediction Using Data Mining Techniques

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ABSTRACT

Stock market nature is considered to be dynamic and susceptible to quick changes because it depends on various factors like share price, fundamental variables like P/E ratio, dividend yield etc. election results, rumors etc. Now a day’s prediction is an important process which determines the future worth of a company. The successful prediction brings motivation and awareness in stock community as well as economic growth of the country. In past various theories and methods like Efficient Market Hypothesis (EMH), Random Walk Theory, fundamental and technical analyses have been proposed. These methods or combination of methods have not got as much success even yet because these methods are very complex and time consuming and performed well on short data. These days stock market users mostly rely on intelligent trading system which would be help them to predict share prices based on various situations and conditions. Data mining is a broad area and also supports various business intelligence techniques. It has mastery to raise various financial issues like buying/selling security, bond analysis, contract analyses etc. in this study various prediction techniques like linear regression, multiple regression, association rule mining, clustering, neural network have been proposed and their significant performances will be compared by Bombay Stock Exchange (BSE) data.

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INTRODUCTION

In these days stock market index prediction is an important concern in finance and business but over the years we have been seen it fluctuating over time and most important affects the stock user’s mentality. So determining more effective ways and adopting more and more profitable tools and techniques for stock market index prediction in order to make more accurate decision will be challenging for stock user’s community (Abdoh & Jouhare, 1996). There are several stock exchanges are available in India due to their increasing profit and growing user’s. Bombay Stock Exchange (BSE) is one of the fastest (speed 200 micro seconds) and more prominent stock exchange over the world. It is established in 1875 and has total 5500 companies listed making it world’s no. one exchange in terms of listed companies (Abdulsalam et al., 2011; Ghezelbash, 2012). Over 140 years BSE has become eye witness of growth of Indian corporate sector by providing it an efficient capital raising platform. At the March 2015 end the total market capitalization calculated 1.68 USD Trillion which make it fifth largest leading exchange in the world (Ankerst, 2001). Data mining is a branch of computer science which is designated for finding hidden patterns (previously unknown) from large amount of data (Han & Kamber, 2006). It is one of important step of Knowledge Discovery in Databases (KDD). In today’s competitive world huge amount of information stored in databases. The retrieval and analysis of this information makes data mining important and necessary technique. Financial institution such as stock market produces a vast amount of data throughout the year that provides a road map for data mining tools and techniques and helps to handle complex problems (Fayyad et al., 1996). Over the years various researchers has paid attention of solving these problems and gained a large profit. Obviously this will help the enhancing the data mining research in future. At a time research in data mining is increasing day by day due to the it’s applicability in various fields and increasing information. Data mining in finance specifies various criteria like profit maximization, multi-resolution forecast (days, weekly and yearly) so it will be big challenge to data mining community to predict useful trends and patterns with reasonable cost and short span of time (Fayyad et al., 1996; Han & Kamber, 2006). Since many years stock price prediction is an interesting task for stock users. In the literature number of methods is applied to accomplish this task. There are various approaches of prediction like informal ways (like chart analysis) to formal ways (like regression methods). The only aim of prediction is to reduce uncertainty associated to investment decision making (Boston, 1998).

BACKGROUND

Data mining is the systematic process of searching hidden patterns and finding relationship between variables and item sets of data. The ultimate goal of data mining process is prediction and prediction data mining plays important role in financial applications (Hong Se & Weiss M., 2001; Tiwari & Thakur, 2015). Since three decades various researcher have contributed in stock market field. Here we have presented some significant research work. Beaver (1966) has proposed a comprehensive study on various financial ratios for bankruptcy prediction model. He concluded that cash flow to debt ratio was the best predictor for bankruptcy among the financial variables. Chih-fong and Yu-Chieh (2010) have proposed multiple feature selection methods with combination of more representative variables for stock market prediction. They used well known feature selection methods like Principal Component Analysis (PCA), Genetic Algorithms (GA) and Decision Trees (CART). In their study they followed various mathemati-