The style characteristic of China's stock market: an application to PCA for interval symbolic data

Dingmu Cao*,**, Wen Long*,**,***

*Graduate University of Chinese Academy of Sciences, Beijing, 100190, China
**Research Center on Fictitious Economy & Data Science, Chinese Academy of Sciences, Beijing 100190, China
***Corresponding author: longwen@ucas.ac.cn

Abstract. By applying the symbolic principal component analysis (SPCA) on the empirical data of the CITIC style indices in six years (2005-2010), we studied the characteristics of Chinese stock market from multiple perspectives. Two components are extracted from five variables–P/E ratio, NMC, turnover rate, return rate, and volatility–and are defined as the market performance factor and the size factor. Further, drawing the run track of the six stock style portfolios and combining with the zoom-star plots of symbolic data, we find that the Chinese stock market is excessive speculated and bounded rational.

1 Introduction

Since the beginning of China's stock market in 1990, it is developing at an alarming rate. The total market capitalization [1] of Chinese mainland stock market was beyond the total GDP [2] for the first time on August 9, 2007. As the main representative of Chinese capital market, the development of China's stock market is important for China's economic reform. There is an urgent need in an in-depth analysis of history and current situation of China's stock market development, and an exploration of the inherent regularity of the development. It is practically necessary not only for the scientific understanding in recent years, but also for decision-making of building healthier and more mature stock markets.

Researches on the stock market have already been done by both domestic and foreign scholars. Cheng (2003) studied the Chinese stock market through the classification of CITIC style index [3], discuss the risk-benefit asymmetry, and pointed out the deficiencies in the system of the Chinese stock market were the underlying causes for excessive speculation.Shi and Xu (2003) performed the technological and economic analysis on the stock market behavior, and quantified the contribution of stock investment and speculation in Chinese stock market.Huang and Sun (2008) made a literature review on stock market bubbles, and pointed out that the real

---

1. Market capitalization (or simply market cap) is the total value of the negotiable shares of a publicly traded company. It is equal to the share price times the number of shares outstanding.
2. Gross domestic product (GDP) is the market value of all officially recognized final goods and services produced within a country in a given period.
3. We will detail the concept of CITIC style index in the third paragraph of Part 2.