Chapter 4
Investor Sentiment Contagion: An Industry Perspective of Investors' Heterogeneity Presented by "Informational Cycle Cascade" With AI's Algorithm

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ABSTRACT

This chapter uses the FEM algorithm of artificial intelligence (AI) to analyze the rule of investor sentiment contagion under "informational cycle cascade". There are five big up or down phases of investor sentiment contagion for the industry average at the whole period. Bad information contagion under the influence of the global finance crisis and good information contagion under the influence of an economic stimulating plan of on big scale indicate that investor sentiment contagion differentiates between the up phase and down phase. The FEM coupling model of investor sentiment is created to compute and analyze investor sentiment contagion among the industries. Cloud picture presents the average space distribution of investor sentiment contagion. In the real capital market, some investors often adjust their investment decisions, and the informational cycle cascade can well explain this phenomenon.

INTRODUCTION

Investors' personal knowledge, investment experience, risk preference and psychology are different when they make the decision. Some investors have cognitive biases and heterogeneous beliefs for asset pricing. This irrational phenomenon for the investor is called investor sentiment in behavioral finance. There are many kinds of individual investor sentiment, and the common kinds are over optimistic sentiment, over pessimistic sentiment, overconfidence, overreaction, etc. When the investors make the decision under sequence choice, the subsequent investors observe the choice made by the preceding investors and the public information in the market. The subsequent investors make the same choice with

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the preceding investors under public information, while not considering their own private information. This phenomenon is called informational cascade.

There are specific running rules for investor sentiment contagion among the industries. The management of investor sentiment can better supervise the normal running of capital market and create the sustainable capital market. The research problem of this chapter is that it uses finite element method (FEM) of the algorithm of artificial intelligence (AI) to compute and analyze flowing velocity, flowing direction and space distribution of "informational cycle cascade" among the industries. The research objective is that this chapter can be used to describe and express the running theory of investor sentiment intuitively. To the best of our knowledge, this chapter is the first to analyze the contagious process of investor sentiment with FEM algorithm among the industries.

The research plan of this chapter is that it first uses factor analysis method to extract investor sentiment factor from industry stock turnover and industry stock volume share. It computes and analyzes empirical data with second GICS industries of listed companies. Generally, investor sentiment contagion among all the industries is either in up phase or in down phase. There are five big up or down phases for industry average at whole period. This chapter creates FEM coupling model of investor sentiment, which can be used to compute and analyze investor sentiment contagion among the industries.

Second, according to the contagious process of investor sentiment at the whole period, two typical phases of industry average are chosen. After information transmits from the first investor to the last investor for the first round, the first investor observes subsequent new information and adjusts the decision, and information contagion starts another new round. So this creates the phenomenon of "informational cycle cascade". For example, in the real capital market, some investors often adjust their investment decisions, and informational cycle cascade can well explain this phenomenon. Good information contagion is basically anticlockwise, while bad information contagion is basically clockwise. Information contagion among noise investors isn't fixed in single direction, while information contagion is multi directions at the same time. Cloud picture presents the average space distribution of investor sentiment contagion.

Because of cognitive biases and heterogeneous beliefs, individual investor can have sentiment in the investment decision (García, 2013; Mclean & Zhao, 2014; Stambaugh et al., 2012). Baker and Wurgler (2006) examine how the cross-section of subsequent stock returns varies with proxies for beginning-of-period investor sentiment. When sentiment is low, subsequent returns are relatively high on smaller stocks, high volatility stocks, unprofitable stocks, non-dividend-paying stocks, extreme-growth stocks, and distressed stocks. Brown and Cliff (2004) investigate investor sentiment and its relation to near-term stock market returns, and point out that individual sentiment is strongly positive to its past levels and positively related to recent large stock returns.

Individual investor sentiment often gather to produce group investor sentiment. Group investor sentiment is mainly caused by herd effect. Herd effect is that noise investors don't pay attention to private information about market and corporation operation, while simulate investment decision made by other investors (Cipriani & Guarino, 2005; Froot et al., 1992; Hirshleifer & Teoh, 2003; Welch, 2000). Shiller (1995) shows that people interacting with each other regularly will tend to think and behave similarly, and this is the reason of herd effect.

In this case "informational cascade" will occur. When the investors make the decision under sequence choice, the subsequent investors observe the choice made by the preceding investors and the public information in the market. The subsequent investors make the same choice with the preceding investors under public information, while not considering their own private information. This phenomenon is called informational cascade. Bikhchandani et al. (1992) indicate that in sequential choices of BHW model, an