Can representativeness heuristic traders survive in a competitive securities market?

Guo Ying Luo[*]

Department of Finance and Business, Economics, DeGroote School of Business, McMaster University, 1280 Main Street, West, Hamilton, Ontario, Canada L8S 4M4

Abstract

The literature views aggressive trading behavior as the key for representativeness heuristic traders to survive in competition with rational traders. This paper provides another reason. That is, in this dynamic model of a competitive securities market, representativeness heuristic traders can derive more expected profit from the misvaluations (created by noise traders) than can rational traders. Consequently, the expected profit for heuristic traders can be bigger than that for rational traders. If traders' types replicate according to the profitability of the strategies, heuristic traders can survive or even drive out rational traders.
© 2012 Elsevier B.V. All rights reserved.

1. Introduction

Representativeness heuristic has been documented by psychologists in their experiments as one type of psychological behavioral bias (see Grether, 1980; Kahneman and Tversky, 1973; Tversky and Kahneman, 1974). Tversky and Kahneman (1974) state "A person who follows this heuristic evaluates the probability of an uncertain event, or a sample, by the degree to which it (i) is similar in its essential properties to the parent population and (ii)

*Tel.: +1 905 525 9140x23983.
E-mail address: luogy@mcmaster.ca

reflects the salient features of the process by which it is generated'' (p. 33). Hence, people with representativeness heuristic think that they can see patterns in a truly random process. Technical traders' extrapolation based on past data is an example of this type of representativeness. Also, when forming posterior beliefs, people with representativeness heuristic place too much weight on their current information and too little weight on their prior knowledge.

There are some empirical papers that provide some evidence of the existence of representativeness heuristic in the financial markets. For example, both DeBondt and Thaler (1985) and Chopra et al. (1992) suggest that traders overreact to current information. Also, representativeness heuristic has been popularly used in the behavioral finance literature to explain the anomaly of asset price overreaction to new information. For example, Barberis et al. (1998) build a model based on psychological evidence, including representativeness heuristic, to address the causes of the asset price overreaction to new information. Hong and Stein (1999) regard the asset price overreaction to new information as a result of technical traders' extrapolation based on the past prices (which pushes prices of past winning stocks above their fundamental values).[1]

To validate the behavioral models with representativeness heuristic, one needs to examine the long-run survival of traders with such heuristic.[2] Fischer and Verrecchia (1999) build an extension of the model of Kyle (1985) to address this issue. In their setting with imperfect competition among informed traders, informed Bayesian and informed heuristic traders both set their demands strategically to maximize their expected profits. Traders do not behave as price takers. Fischer and Verrecchia (1999) find that heuristic traders can survive and coexist with informed Bayesian traders. The reasons that heuristic traders can survive come from the fact that heuristic traders who overreact to their private information trade more aggressively than informed Bayesian traders. Such aggressive trading in turn allows them to capture more information rents.

To see if the aggressive trading of heuristic traders is the only reason for them to survive or whether the imperfect competition among informed traders also contributes to the survival of heuristic traders, this paper builds a model of a competitive securities market to examine the long-run survival of heuristic traders. In the securities market, there are two assets: one risk-free asset and one risky asset, and three types of potential traders: rational traders, representativeness heuristic traders and noise traders. Noise traders' trades are based on their liquidity needs, hence, their demand for the risky asset is assumed to be random. All traders know that the payoff of the risk-free asset is one. The payoff of the risky asset is unknown, but traders have prior knowledge about the distribution of the risky asset's payoff. Before any trade takes place, an informational signal about the risky asset's payoff is released to the market. In updating their prior beliefs about the expected mean and variance of the risky asset's payoff, heuristic traders place too much weight on

---

[1]There are other papers using other psychological biases to explain the anomalies of the asset price. For example, Daniel et al. (1998) assume that investors suffer from self-attribution bias in interpreting their ability to pick stocks. In other words, investors attribute the good performance of wining stocks to their ability to pick stocks and the poor performance of losing stocks to bad luck. As a result, they become overconfident about their ability to pick the winning stocks and overestimate the precision of their information signal. They push the prices of winning stocks above their fundamental values.

[2]In the behavioral finance literature, investors' overconfidence is also used to explain the anomaly of asset price overreaction to new information. Instead of studying which behavioral model does a better job of explaining the anomaly, this paper focuses on examining the long-run viability of traders with representativeness heuristic.