



## BEHAVIORAL STOCK MARKET MODEL TO REFLECT THE INFLUENCE OF GREED AND FEAR OF TRADERS IN COLOMBO STOCK EXCHANGE

M. T. M. Perera

*Department of Mathematics, University of Sri Jayewardenepura, Nugegoda, Sri Lanka*

[madu.thamali@sjp.ac.lk](mailto:madu.thamali@sjp.ac.lk)

In a real market, stock prices show fluctuations overtime and sometimes they show trends. As a general consequence when prices showing an upward trend, investors tend to invest more. But high volatility and crashes in stock prices would undergo short in stocks. In behavioral models, the trading activities of agents can be characterized by two emotional states, greed and fear where traders act greedily when prices show an upward trend and will anxiety to invest when there are unusual fluctuations.

To study the impact of emotional factors of traders in Colombo Stock Exchange (CSE), the All Share Price Index (ASPI) was selected and ASPI daily data from 2005 to 2014 were collected from CSE. Actual data reveals some of the stylized facts such as long run upward trend with regular crashes, gain/ loss asymmetry and absence of autocorrelations in log returns.

This study examines a deterministic behavioral financial model which reflects the real dynamics of ASPI in which traders are driven by their emotions, and mimic the stylized factors. In order to identify the relationship between trading activity and asset price in the market a log linear price impact function has been used to make price adjustments which captures the price movements caused by the execution of an order. The study was done under the assumption that traders can switch between two activity levels ( $\alpha_t$ ) at a time. If market volatility is low, traders are calm and maintain their usual trading behavior; otherwise they are rather vigorous and show greedy or fearful buying behavior. Two separate values have been determined through the analysis to represent those activity levels, considering the average volatility in last five trading periods. So then the demand function was determined in the form of  $\alpha_t$  such a way that it would capture the greed and fear of the traders. The model has the ability to produce the long run upward trend with several crashes, volatility clustering and some of the stylized facts as in the real market. The model suggests that emotions such as greed and fear may play a role in determination of index prices.

**Keywords:** greed and fear, stylized facts, volatility clustering, price impact function.