On possible origins of trends produced by human choices —the case of financial market price changes—

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Abstract

We often observe trends as social phenomena. One of the trends is price change (price movement) in financial markets. We investigate the possible origins of trends using a deterministic threshold model. The investigation indicates that the emergence of trends is all but inevitable in the realistic situation because of the fact that dealers cannot always obtain accurate information about deals, even if there is no external influence.

Keyword: human society, human choices, social phenomena, trends

1 Introduction

Many phenomena in human society are composed of human choices. Buying and selling is one of the human choices, and we regard financial markets as the aggregation of market participants' choices and their interactions. A major indicator in financial markets is price change (price movement). Price change in financial markets fluctuates irregularly, and the irregular fluctuations can be divided into two main features, short-term variabilities and long-term variabilities. We treat the long-term variabilities of financial market price changes as trends observed in human society in this work.

There are two factors which are vaguely considered to be the main origins of these fluctuations, fundamentals and technical analyses. However, it brings up the following simple question on the origin of trends nonetheless: if it were not for these factors, do trends make no appearance at all? We focus our attention mainly on this point and investigate the possible origins of trends by human choices using a deterministic threshold model.

2 Methodology and Result

We use a previously proposed deterministic dealer model with threshold elements [1]. Figure 1 shows that the behaviours of the red line are stable over long periods and fluctuates around the mean value showing short-term variabilities but does not have trends. In the model all precise information about deals is used. However, it is unlikely and unnatural in actual deals. Hence, we introduce the following idea to the model: we cannot obtain all precise information about deals, where other conditions for the model is the same. Figure 1 shows that irregular fluctuations of black line with short-term variabilities and long-term variabilities (trends) emerge spontaneously. The interesting point is that the result indicates a possibility that the emergence of trends is all but inevitable in the realistic situation.

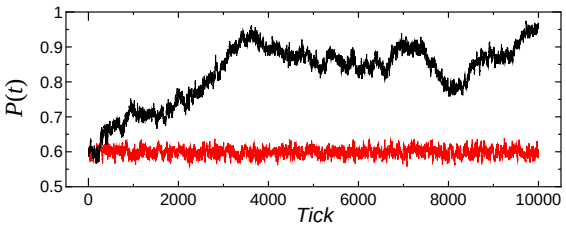

Figure1: (colour online) Typical behaviours of the dealer model when we can and cannot obtain precise information about deals, where $P(t)$ is simulated price data.

References

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