Time intervals between successive tradings in yen/dollar foreign currency market: from microscopic model to macroscopic model

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Statistical properties time series of stock market prices or foreign currency rates have been stimulatively investigated. Two stylized facts are indicated: a probability density function of log returns or changes has fat tails and that autocorrelation function of absolute (squared) log return or changes has long time correlation in price and rate fluctuations [1, 2]. Many models are proposed. However these models are focused on the log returns or the changes. Recently time intervals between successive tradings is attracting researchers [3, 4]. In foreign currency market cumulative distribution functions of the time intervals between successive tradings have power law tail [3]. Moreover it has not been yet proposed the microscopic model to explain such a statistical feature. On the presentation I will talk about statistical properties of the time interval, microscopic model having many interactive dealers in a market, and derivation of a macroscopic stochastic process for time intervals between successive tradings from the proposed microscopic model. The stochastic process corresponds to autoregressive conditional duration (ACD) process which has been studied in financial literature [5, 6]. I will indicate that the ACD is related to the self-modulation process (SMP) proposed by Takayasu *et. al.* [7].

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