

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

A Weibull distribution with power-law tails that describes the first passage time processes of foreign currency exchanges NAOYA SAZUKA, Sony Corporation, JUN-ICHI INOUE, Hokkaido University — A Weibull distribution with power-law tails is confirmed as a good candidate to describe the first passage time process of foreign currency exchange rates. The Lorentz curve and the corresponding Gini coefficient for a Weibull distribution are derived analytically. We show that the coefficient is in good agreement with the same quantity calculated from the empirical data. We also calculate the average waiting time which is an important measure to estimate the time for customers to wait until the next price change after they login to their computer systems. By assuming that the first passage time distribution might change its shape from the Weibull to the power-law at some critical time, we evaluate the averaged waiting time by means of the renewal-reward theorem. We find that our correction of tails of the distribution makes the averaged waiting time much closer to the value obtained from empirical data analysis. We also discuss the deviation from the estimated average waiting time by deriving the waiting time distribution directly. These results make us conclude that the first passage process of the foreign currency exchange rates is well described by a Weibull distribution with power-law tails.

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Date submitted: 16 Nov 2006

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