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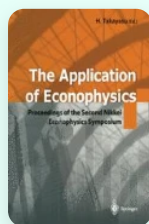
Time Evolution of Fractal Structure by Price-Axis Scaling and Foreign Exchange Intervention Operations

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Summary

We propose a simple method to describe the fractal structure of data, which are irregularly spaced. Using the extreme values determined with a scale, we define a kind of fractal dimension: the fold dimension. This method is based on the same concept as a technical analysis: Kagi chart. In this contribution, we use a high-frequency data set on bid and ask prices of the Dollar/Yen exchange rates, and investigate time evolution of the fractal dimension. Moreover we analyze the effect of foreign exchange intervention operations.



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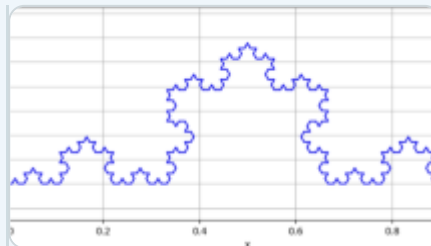
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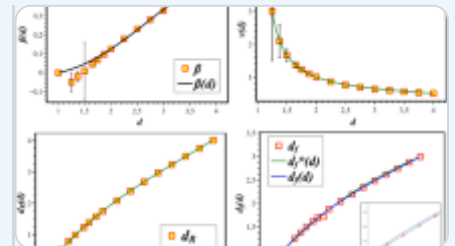
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References

1. Ghysels E (2000) Some econometric recipes for high-frequency data cooking. *Journal of Business and Economic Statistics*, 18: 154-163
2. Kumagai Y (2001) Time-space scaling of financial time series. In: Takayasu H (Eds) *Empirical science of financial fluctuations*. Springer-Verlag Tokyo, pp 250-260
3. Kumagai Y (2002) Fractal structure of financial high frequency data. *Fractals*, 10: 13-18
4. Kumagai Y (2002) Fractal dimension of high frequency data in foreign exchange market. *Journal of the Korean Physical Society*, 40: 1100-1104
5. Steve N (1994) *Beyond Candlesticks: More Japanese charting techniques revealed*. John Wiley & Sons

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