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Power laws in economics and finance: some ideas from physics

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Abstract

We discuss several models in order to shed light on the origin of power-law distributions and power-law correlations in financial time series. From an empirical point of view, the exponents describing the tails of the price increments distribution and the decay of the volatility correlations are rather robust and suggest universality. However, many of the models that appear naturally (for example, to account for the distribution of wealth) contain some multiplicative noise, which generically leads to non-universal exponents. Recent progress in the empirical study of the volatility suggests that the volatility results from some sort of multiplicative cascade. A convincing 'microscopic' (i.e. trader based) model that explains this observation is however not yet available. It would be particularly important to understand the relevance of the pseudo-geometric progression of natural human time scales on the long-range nature of the volatility correlations.

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