Quantitative Finance > Trading and Market Microstructure

Does Security Transaction Volume-Price Behavior Resemble a Probability Wave?

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Motivated by how transaction amount constrain trading volume and price volatility in stock market, we, in this paper, study the relation between volume and price if amount of transaction is given. We find that accumulative trading volume gradually emerges a kurtosis near the price mean value over a trading price range when it takes a longer trading time, regardless of actual price fluctuation path, time series, or total transaction volume in the time interval. To explain the volume-price behavior, we, in terms of physics, propose a transaction energy hypothesis, derive a time-independent transaction volume-price probability wave equation, and get two sets of analytical volume distribution eigenfunctions over a trading price range. By empiric test, we show the existence of coherence in stock market and demonstrate the model validation at this early stage. The volume-price behaves like a probability wave.

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