

Chern-Simons Equation in Financial Theory and Time-Series Analysis

Authors : Ognjen Vukovic

Abstract : Chern-Simons equation represents the cornerstone of quantum physics. The question that is often asked is if the aforementioned equation can be successfully applied to the interaction in international financial markets. By analysing the time series in financial theory, it is proved that Chern-Simons equation can be successfully applied to financial time-series. The aforementioned statement is based on one important premise and that is that the financial time series follow the fractional Brownian motion. All variants of Chern-Simons equation and theory are applied and analysed. Financial theory time series movement is, firstly, topologically analysed. The main idea is that exchange rate represents two-dimensional projections of three-dimensional Brownian motion movement. Main principles of knot theory and topology are applied to financial time series and setting is created so the Chern-Simons equation can be applied. As Chern-Simons equation is based on small particles, it is multiplied by the magnifying factor to mimic the real world movement. Afterwards, the following equation is optimised using Solver. The equation is applied to n financial time series in order to see if it can capture the interaction between financial time series and consequently explain it. The aforementioned equation represents a novel approach to financial time series analysis and hopefully it will direct further research.

Keywords : Brownian motion, Chern-Simons theory, financial time series, econophysics

Conference Title : ICAQSP 2015 : International Conference on Applied Quantum and Statistical Physics

Conference Location : London, United Kingdom

Conference Dates : September 25-26, 2015