OPTIMIZATION OF THE POWER DERIVATIVES PORTFOLIO BY THE PERCOLATION METHOD

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In modern financial world, where the power markets are very complex and unpredictable, the optimization of the power derivatives portfolio is extremely important. The general structure of the electricity markets includes a capacity market, a system services market, retail electricity markets, a financial derivatives market, and a market for financial transmission rights.

The day-ahead electricity market is organized in the form of an auction of price bids. In this market, the risks of high volatility and price unpredictability are very high. The main hedging tool here is derivatives. Any classic methods for evaluating futures, options, CFD, spark spread do not work here. Moreover, each of the derivatives has its own types of risks, so a dynamic portfolio management model for such financial instruments should be used for hedging.

Founded in 2000, the Intercontinental Exchange has the following trading platforms: ICE Futures U.S., ICE Futures Europe, ICE Futures Canada, ICE Liffe, ICE ETF Hub, NYSE. Thus, using methods of working with Big Data, it is possible to create and manage well-diversified portfolios in real time.

In today's global economy, old methods no longer work, so it has recently become a practice to use suitable models from the natural sciences when analyzing markets.

In paper [1], the appearance of defects in a fractal medium was actually considered in the pseudo-diffusion process. Further, developing the approach used in this work, it seems appropriate for us to use two options for constructing a derivatives portfolio optimization model.

The first option is to use equations in fractional derivatives. However, the numerical implementation of this approach does not meet the requirement of real-time operation.

The second option is to use a percolation model closely related to fractality. Further, developing methods of work [2], we train neural networks in methods of portfolio optimization and management in real time.

References (translated):

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