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Abstract: In this study, we evaluate the portfolio performance by Data Envelopment Analysis (DEA) as a nonparametric efficiency analysis tool. Our model describes the dynamics of assets' log prices by a stochastic process which is named Variance-Gamma (VG) process [1]. Risk measure of our model is Conditional Value at Risk (CVaR)[2]. Therefore, the model is in mean-CVaR framework under VG process. Conventional DEA models consider mainly nonnegative data. However, in real data world, inputs and outputs may as well take negative values. So, our proposed model is the Range Directional Measure-like model that can take positive and negative values[3]. Finally, we present a case study of the stock market to demonstrate the applicability of the proposal model. For estimating the parameters in the model we use Monte Carlo approach and a nonlinear programming technique.

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REFERENCES

- [1] D. B. Madan and E. Senata, "Option pricing under VG", *Journal of business*, Vol. 63, pp.511-524, 1990.
- [2] R. T. Rockafellar and S. Uryasev, "Portfolio Optimizatin with CVaR", *Journal of Risk*, Vol. 2, pp.21-41, 2000.
- [3] M. C. Portela and E. Thanassoulis, "A Directional distance approach to deal with negative data in DEA", *European Journal of Operational Research*, Vol. 10, pp.1111-1121, 2004.