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Monte Carlo Simulation with Asymptotic Method

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Abstract: We shall propose a new computational scheme with the asymptotic method to achieve variance reduction of Monte Carlo simulation for numerical analysis particularly for finance. We not only provide general scheme of our method, but also show its effectiveness through numerical examples such as computing optimal portfolio and pricing an average option. Finally, we show mathematical validity of our method.

Key words: asymptotic method, average options, derivatives, finance, Malliavin calculus, Monte Carlo simulation, optimal portfolio

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