

Barrier Option Pricing Under Sabr Model Using Monte Carlo

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Barrier Option Pricing Under Sabr

1. Abstract The project investigates the prices of barrier options from the constant underlying volatility in the Black-Scholes model to stochastic volatility model in SABR framework. The constant volatility assumption in derivative pricing is not able to capture the dynamics of volatility. In order to resolve the shortcomings of the Black-Scholes model, it becomes necessary to find a model that reproduces the smile effect of the volatility.

Barrier Option Pricing under SABR Model Using Monte Carlo ...

When the lower barrier is zero, the down-and-out call option price turns out to be the arbitrage-free European option price under the SABR model. This paper's approximation of Equation 24 with 22 is essentially the same as the analytical formula given in Yang et al. (2017) (see formulas 27 and 28).

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Pricing Continuously Monitored Barrier Options under the ...

We then discussed pricing options with quasi Monte Carlo techniques under the SABR model. In particular, we focused on pricing barrier options by quasi Monte Carlo and conditional probability correction methods and on pricing American options by the least squares Monte Carlo method.

Pricing barrier and American options under the SABR model ...

Pricing barrier and American options under the SABR model ... There are two strands of literature related to arbitrage-free option pricing under the SABR model and analytical barrier option pricing, respectively. First, various numerical remedies to the arbitrage problem of the SABR model have been introduced.

Barrier Option Pricing Under Sabr Model Using Monte Carlo

We then discuss pricing options with quasi-Monte Carlo techniques under the SABR model. In particular, we focus on pricing barrier options by quasi-Monte Carlo and conditional probability correction methods and pricing American options by the least squares Monte Carlo method.

Pricing Barrier and American Options under the SABR model ...

pricing techniques using quasi-Monte Carlo methods for barrier and American options under the SABR model in Section 3. Next, we study programming techniques for pricing these options on the GPU in Section 4. Additionally, we illustrate that efficient memory management is also crucial for a good GPU implementation. In Section 5, we implement numerical experiments and demonstrate the speedup performance of GPU programs for option pricing. 2.

Pricing Barrier and American Options under the SABR model ...

Tian et al (2012) priced barrier and American options by the least squares MC method under the SABR model. Shiraya et al (2012) provided a numerical model for pricing double-barrier call

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options with...

Pricing barrier and American options under the SABR model ...

Hence, pricing a European call under the SABR model without arbitrage is equivalent to pricing a down-and-out call option with a knock-out boundary at zero. If it is a put option, then
$$V_p(t, f, a) = E[(K - F_T) + 1_{\{\tau_t > T\}} | F_t = f, A_t = a] + K \cdot E[1_{\{\tau_t \leq T\}} | F_t = f, A_t = a].$$

Approximate arbitrage-free option pricing under the SABR ...

To price American options, once more two numerical methods are designed. The first one is based on the Least-Squares Monte Carlo method, and the second one is the same tree method used to price European options under the SABR model, with some slight modifications. By comparing the results of these two

Pricing options with the SABR Model

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Approximate Arbitrage-Free Option Pricing under the SABR Model

method for pricing barrier options under stochastic volatility models by applying the asymptotic expansion with a static hedging method. It also provides numerical examples under the λ -SABR model. Section 5 applies the high-order expansion scheme to pricing average options and presents numerical examples under the SABR and λ -SABR models. Section 6 concludes.

CIRJE-F-745 Pricing Barrier and Average Options under ...

Market volatility smile risk in derivative pricing can be modelled by the Stochastic Alpha Beta Rho (SABR) model. Once calibrated to market data, prices of European and continuously monitored...

A Spectral Approach to Pricing of Arbitrage-Free SABR ...

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Market volatility smile risk in derivative pricing can be modelled by the Stochastic Alpha Beta Rho (SABR) model. Once calibrated to market data, prices of European and continuously monitored barrier options can be obtained using equivalent Black's implied volatility approximations.

A Spectral Approach to Pricing of Arbitrage-Free SABR ...

style barrier options in a Markovian, regime-switching, Black-Scholes-Merton economy, where the price process of an underlying risky asset is governed by a Markovian, regime-switching, geometric Brownian motion.' Finally, the trend of the 2010s has been to apply the SABR (Stochastic, Alpha, Beta, Rho) stochastic volatility

A Probabilistic Monte Carlo model for pricing discrete ...

Under the SABR model, it turns out that pricing a vanilla call without arbitrage is equivalent to pricing a down-and-out call with a knock-out boundary at zero. However, the SABR model is not symmetric, which makes the aforementioned approaches invalid.

Approximate Arbitrage-Free Option Pricing under the SABR Model

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