Mathematical Finance
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Recall 12

Smile dynamics

1. What is the spot volatility?
2. What is the instantaneous forward variance curve?
3. What is the Bergomi's model? What can you say about it?

Local stochastic volatility models

1. What are the advantages and drawbacks of local volatility and stochastic volatility?
2. What is a local stochastic volatility model? What can you say about it? What is the goal of this model?

Rough volatility models

1. What is a rough volatility model?
2. What is the definition of a fractional Brownian motion?
3. What is the rough Heston Model?

Interest rate theory in continuous time

1. How are the money market account B_t and the short rate process r linked?
2. What is an arbitrage free family of bound prices?
3. What is a forward contract?
4. What is the forward martingale measure?
5. What is the forward price? Can you prove it?
6. What is the price of an option of a zero-coupon bond? Can you prove it?
7. What is an interest rate swap?
8. What is a cap? What is the price of a cap?

Short rate models

1. What is the Vasicek model? What is the price of zero-coupon bond in the Vasicek model?
2. What is the CIR model? What can you say about it?
3. What is the Hull-White model? What is the advantage with comparison to previous models? Can you give the price of a zero-coupon bond in the Hull-White model?