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# Risk Management for Derivatives in Illiquid Markets: A Simulation Study

| Chapter

| pp 137–159 | [Cite this chapter](#)

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[Rüdiger Frey](#) & [Pierre Patie](#)


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## Summary

In this paper we study the hedging of derivatives in illiquid markets. More specifically we consider a model where the implementation of a hedging strategy affects the price of the underlying security. Following earlier work we characterize perfect hedging strategies by a nonlinear version of the Black-Scholes PDE. The core of the paper consists of a simulation study. We present numerical results on the impact of market illiquidity on hedge cost and Greeks of derivatives. We go on and offer a new explanation of the smile pattern of implied volatility related to the

lack of market liquidity. Finally we present simulations on the performance of different hedging strategies in illiquid markets.

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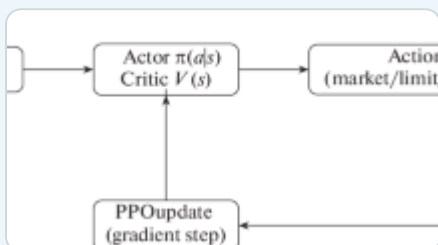
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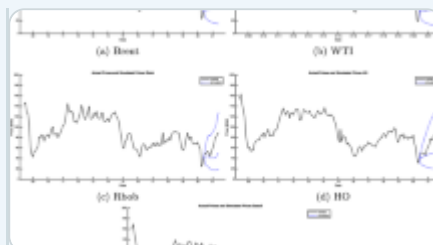
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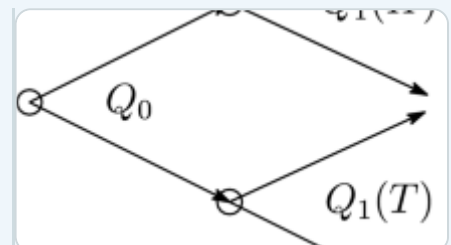
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## Author information

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### Authors and Affiliations

**Swiss Banking Institute, University of Zurich, Switzerland**

Rüdiger Frey

**RiskLab, Department of Mathematics, ETH Zurich, Switzerland**

Pierre Patie

## Editor information

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### Editors and Affiliations

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