



Quantitative Finance >

Volume 12, 2012 - [Issue 1](#)

356 | 28 | 0
Views | CrossRef citations to date | Altmetric

Research Papers

Arbitrage-free approximation of call price surfaces and input data risk

Judith Glaser & Pascal Heider

Pages 61-73 | Received 29 Sep 2009, Accepted 04 Aug 2010, Published online: 14 Dec 2010

Cite this article <https://doi.org/10.1080/14697688.2010.514005>

Sample our
Mathematics & Statistics
Journals
>> **Sign in here** to start your access
to the latest two volumes for 14 days

Full Article

Figures & data

References

Citations

Metrics

Reprints & Permissions

Read this article

Share

Abstract

In this paper we construct arbitrage-free call price surfaces from observed market data by locally constrained least squares approximations. The algorithm computes derivatives of the call surface accurately so that implied volatility, local volatility and transition probability density can be obtained at no additional cost. Observed input data are afflicted by a price uncertainty due to the bid-ask spread, quote imprecision and non-synchrony and cause an input data risk on the computed call surface and subsequently on the implied volatility surface. We model the input risk and perform an analysis to study and measure the effect of the input risk on the surfaces. With this analysis we can determine the trustworthiness of the computed results and their implications for option pricing a posteriori.

Keywords:

Acknowledgements

The authors would like to thank two anonymous referees for helpful comments and suggestions that helped to improve the quality of the paper.

Notes

†Define the function $f(K, \tau) := C(Ke^{(r-q)\tau}, T + \tau)e^{-q\tau}$, then $\partial f / \partial \tau|_{\tau=0}$ corresponds to the above differential quotient.

Related research

People also read

Recommended articles

Cited by
28

Information for

Authors

R&D professionals

Editors

Librarians

Societies

Opportunities

Reprints and e-prints

Advertising solutions

Accelerated publication

Corporate access solutions

Open access

Overview

Open journals

Open Select

Dove Medical Press

F1000Research

Help and information

Help and contact

Newsroom

All journals

Books

Keep up to date

Register to receive personalised research and resources by email

 Sign me up

