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Volume 13, 2013 - [Issue 6: Themed Issue on Option Pricing and Hedging](#)

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A new sampling strategy willow tree method with application to path-dependent option pricing

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Pages 861-872 | Received 12 Jun 2012, Accepted 18 Dec 2012, Published online: 20 Mar 2013

 Cite this article  <https://doi.org/10.1080/14697688.2012.762111>

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Abstract

The willow tree algorithm, first developed by Curran in 1998, provides an efficient option pricing procedure. However, it leads to a large bias through Curran's sampling strategy when the number of points at each time step is not large. Thus, in this paper, a new sampling strategy is proposed. Compared with Curran's sampling strategy, the new strategy gives a much better estimation of the standard normal distribution with a small number of sampling points. We then apply the willow tree algorithm with the new sampling strategy to price path-dependent options such as American, Asian and American moving-average options. The numerical results illustrate that the willow tree algorithm is much more efficient than the least-squares Monte Carlo method and binomial tree method with higher precision.

Keywords:

[American options](#)[Applied mathematical finance](#)[Derivatives pricing](#)[Option pricing](#)[Numerical methods for option pricing](#)

JEL Classification :

[G1](#)[G12](#)[G13](#)

Acknowledgements

This work was supported by the Natural Science Foundation of China (project No. 11101310), Specified Research Fund for the Doctoral Program of Higher Education (SRFDP) (20110072120008) and the Fundamental Research Funds for the Central Universities. We are grateful to the anonymous reviewer for his/her valuable comments and suggestions that helped make the paper more precise and readable.

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Published online: 4 Nov 2016

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