



Mathematics > Probability

Efficient Discretization of Stochastic Integrals

Masaaki Fukasawa

(Submitted on 3 Apr 2012)

Sharp asymptotic lower bounds of the expected quadratic variation of discretization error in stochastic integration are given. The theory relies on inequalities for the kurtosis and skewness of a general random variable which are themselves seemingly new. Asymptotically efficient schemes which attain the lower bounds are constructed explicitly. The result is directly applicable to practical hedging problem in mathematical finance; it gives an asymptotically optimal way to choose rebalancing dates and portfolios with respect to transaction costs. The asymptotically efficient strategies in fact reflect the structure of transaction costs. In particular a specific biased rebalancing scheme is shown to be superior to unbiased schemes if transaction costs follow a convex model. The problem is discussed also in terms of the exponential utility maximization.

Subjects: **Probability (math.PR)**; Computational Finance (q-fin.CP); Portfolio Management (q-fin.PM)

Cite as: [arXiv:1204.0637v1](#) [math.PR]

Submission history

From: Masaaki Fukasawa [[view email](#)]
[v1] Tue, 3 Apr 2012 09:40:55 GMT (15kb)

[Which authors of this paper are endorsers?](#)

Link back to: [arXiv](#), [form interface](#), [contact](#).

Download:

- [PDF](#)
- [PostScript](#)
- [Other formats](#)

Current browse context:

math.PR

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [1204](#)

Change to browse by:

[math](#)

[q-fin](#)

[q-fin.CP](#)

[q-fin.PM](#)

References & Citations

- [NASA ADS](#)

Bookmark([what is this?](#))

