



The University of Chicago
Department of Statistics

Seminar Series

MARK H. A. DAVIS

Department of Mathematics
Imperial College, London

**Arbitrage Bounds on the Prices of Vanilla Options
and Variance Swaps**

MONDAY, November 24, 2008 at 4:00 PM
133 Eckhart Hall, 5734 S. University Avenue

Refreshments following the seminar in Eckhart 110.

ABSTRACT

In earlier work with David Hobson (Mathematical Finance 2007) we established necessary and sufficient conditions under which a given set of traded vanilla option prices is consistent with an arbitrage-free model. Here we ask, given that these conditions are satisfied, what are the bounds on the price of a variance swap written on the same underlying asset (given that its price is a continuous function of time). It turns out that there is a non-trivial lower bound, computed by a dynamic programming algorithm, but there is no upper bound unless we impose further conditions on the price process. In view of the well-known connection between variance swaps and the log option, appropriate conditions relate to left-tail information on the price $S(T)$ at the option exercise time T , such as existence of a conditional inverse power moment. One can also reverse the question and ask what information a variance swap provides about the underlying distribution.

Please send email to Mathias Drton (drton@galton.uchicago.edu) for further information. Information about building access for persons with disabilities may be obtained in advance by calling Kelly Macias (773.702.8333) or by email (kmacias@galton.uchicago.edu).