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The weather in the U.S. this winter has been pretty extreme, giving rise to one of my favorite quips of the season from Gail Collins in *The New York Times* on February 5, 2010: "Washington was immobilized by snow on Friday. This is highly unusual. Normally, Washington is immobilized by senators." For a derivatives person this raises the question: Does complete paralysis mean absence of volatility? Apparently not. In any case, the Europeans have stepped forward to provide volatility adequate for all of our needs as they try to deal with the PIIGS problems.

This issue of *The Journal of Derivatives* features six articles, and all are related to the volatility-of-returns processes in one way or another. The first article by Dowd looks at Value at Risk, a direct function of returns volatility. There are several ways to estimate where the α-percentile of the returns distribution falls, giving a point estimate of α-VaR. But how accurate is that estimate? Dowd presents a simple, but elegant, approach to constructing confidence intervals nonparametrically for VaR and for a wide class of other risk measures. The second article by Trolle and Schwartz explores the market pricing of variance swaps tied to the volatility of commodity prices. Variance swaps offer a way to directly manage volatility risk exposure, and the swap rate measures the market's risk-neutral expectation of the variance of the underlying. The authors find negative variance risk premiums for crude oil and natural gas, as with the S&P 500, but also find important differences in the way risk-neutral variance behaves in the three markets.

Calculating VaR and other tail-risk measures, such as expected shortfall (ES), can become very computation-intensive when a portfolio is exposed to multiple risk factors and/or it has nonlinear payoffs. In the third article, Yueh and Wong offer an approach to VaR estimation for such cases using characteristic functions and Fourier inversion. This may be a fairly challenging technology for many, but it is worth learning about. The authors present examples with the new procedures that achieve more than a hundredfold improvement in performance over the current methodology. The next article is by Ross and Ghamami, who introduce a clever new way to increase efficiency for Monte Carlo simulation of jump-diffusions by breaking the simulation path into pure jumps connected by segments of pure

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diffusion. This approach is noteworthy because although efficient computational techniques have been developed for simulating diffusion processes, jumps introduce another order of complexity.

Orosi, in the fifth article of the issue, considers modeling the implied volatility surface. Implied volatilities show a smile or skew pattern across strikes for options with a given maturity, and the smiles become a volatility surface when multiple maturities are examined at the same time. Because the smile actually represents the *mispricing* of options under the Black–Scholes model, there is no theoretical specification for it. Orosi proposes approximating the volatility surface with a nonparametric spline function.

Costabile and Massabó, in the final article, present a technique for constructing binomial and trinomial derivatives valuation lattice models when variance is time varying. Normally, this would cause the tree to splinter and the number of nodes to grow exponentially, but the authors show how the middle nodes can be made to recombine even with time-varying mean and variance. Their approach eliminates the need to begin by transforming the underlying process into a process with constant variance before building the tree.

Stand by for the impending thaw in Washington. The snow, at least, has to melt by springtime, even if the Senate doesn't. Will the PIIGS be back in the barn by then?

Stephen Figlewski
Editor

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