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The hotly contested U.S. midterm elections are now past. The people have spoken, pretty loudly, so that must mean a significant decrease in uncertainty, with a reduction in volatility close behind. Right? Well... maybe by the time you are reading this the situation may have clarified, but somehow, that does not seem too probable right now. Seeking common ground let us move on to the articles in this issue of *The Journal of Derivatives*.

In the early days of Black and Scholes, even an option feature as common and straightforward as American exercise presented serious difficulties for valuation models. The development of lattice techniques and a variety of approximations that led to more or less closed-form solutions provided ways to deal with American exercise and many related flavors of options beyond vanilla. Since then, the market's taste in derivatives has become ever more sophisticated, generating a constant need for evolution of both theory and technology.

This issue features several articles that take important steps forward along this path. The lead article by Hull and White presents a new approach to modeling default risk exposure in a collateralized debt obligation (CDO) portfolio. The CDO tranche values depend critically on the default intensity of each of the N credits in the portfolio and also on all of the correlations among them. Without restricting the problem, this involves at least $(N^2 + N)/2$ separate parameters, a huge number for portfolios that typically hold more than 100 names. The Gaussian copula model has become the industry's standard way to compress the problem (at the cost of several heroic assumptions), but without further constraints, there remain an awful lot of parameters. Adding a restriction such as all pairwise correlations must be equal can do the trick, but, unfortunately, that degree of heroism leads to internal inconsistencies similar to the familiar implied volatility smile. A single value for correlation can easily be implied out from the market prices of a CDO tranche, but different tranches of the same portfolio regularly yield very different implied correlations. What seems clearly to be needed is a new model for default correlation that can be calibrated to market tranche prices without leading to internal inconsistency. Hull and White provide such a model. By allowing default inten-

sities to be stochastic, they are able to obtain much better behavior for tranche correlation while matching market prices.

American exercise for options with path-dependent payoffs poses another difficult problem for valuation technology. Backward induction in a trinomial lattice is a convenient way to deal with early exercise, but only for path-independent payoffs. Forward looking Monte Carlo methods work for path dependence, but run into serious difficulty for American exercise. Progress was made using lattices adapted to carry along additional state variables. The problems became feasible—a major step forward—but still very difficult computationally, thus limiting practical applicability. In our second article, Lin and Ritchken show how to achieve a substantial increase in performance by carrying along a much smaller number of values for the auxiliary variables.

Fourier transform methods provide versatile new tools for derivatives pricing and hedging because they make essentially closed-form models possible for a much broader variety of probability distributions and payoff patterns. Computational problems can arise, however, because numerical evaluation is needed for complex integrals that can be badly behaved. In the third article, Kjaer shows how introducing a smoothing procedure can make this much easier.

Next is a fresh look at puzzling empirical evidence that the market often fails to obey—one of the most basic principles of option theory—that an increase in the stock price should increase the value of a call and decrease the value of a put. About 10 percent of the time it seems, a call trades at a lower price immediately after the stock has risen and a put trades at a higher price. Pérignon finds this anomalous result in transactions data from five different index options markets, confirming the earlier results for the S&P 500 Index. But a closer look at the data suggests that market microstructure effects, like bid-ask bounce, can account for a lot of the apparent anomaly. Finally, in the last article of this issue, Dowd offers a very straightforward and general technique for examining statistical significance and for constructing confidence intervals around VaR estimates.

Well, whether the financial situation has become any less murky or not, one thing is evident with no uncertainty at all, the 2008 electoral campaign is now under way. Stand by for further developments.

Stephen Figlewski
Editor

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