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Sometimes a set of papers on related topics are ready for publication at the same time. This time it is computational finance. In this issue of *The Journal of Derivatives,* our first four articles focus on ways to increase the efficiency of numerical valuation procedures. As anyone who has ever done much of this work understands, the issue is not just helping major financial firms to reduce their expenditures on information technology. Many not-too-uncommon derivatives, especially those with multiple underlying stochastic factors, can hardly be priced at all with currently available methods (or, to be more precise, not with reasonable accuracy in any reasonable period of time using a full-fledged model). This means traders have to use makeshift pricing procedures and academic researchers are strictly limited in the kinds of analysis they can conduct, because of the difficulty in computing accurate theoretical values and Greek letter risks.

Instruments with exposure to multiple risk factors invariably present problems. The rapidly evolving array of actively traded credit derivatives, especially derivatives on portfolios of risky credits like collateralized debt obligations (CDOs), are a good example. Payoffs on CDO tranches depend very heavily on correlation among defaults in the underlying credit portfolio. The normal copula model, which has become the current standard approach among practitioners, becomes quite challenging to calibrate to market data for all but the simplest correlation structures. Our first article, by Overbeck and Schmidt, offers a new technique based on transforming the time scales of the underlying risk factors. This allows the correlation structure to be obtained in closed form, which greatly facilitates calibration.

Monte Carlo simulation of derivatives with early exercise features gives rise to another class of important but computationally difficult problems. European options, and standard (i.e., non-exotic) options with American or Bermudan exercise, can be priced relatively easily by working backwards from expiration in a lattice model, because the option value at each point depends only on the current price of the underlying and the process that governs its subsequent evolution. Derivatives with path-dependent payoffs, on the other hand, need a forward-looking approach like Monte Carlo, because the value at each date is a function of the entire path of the underlying up to that point. Monte Carlo simulation has trouble with American options, however, because simulating the early exercise decisions must also consider the future paths forward from

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each possible exercise date. Increasingly, important classes of derivatives, like Bermudan swaptions, have both early exercise and also path-dependent payoffs. This makes for major computational difficulties with any approach because, in principle, every early exercise decision should spawn an extensive subsidiary Monte Carlo analysis running forward from that date. Limiting the proliferation of future paths to be analyzed is the key to achieving acceptable performance. Our second article, by Jensen and Svenstrup, presents an enhanced Monte Carlo approach to obtain pricing bounds efficiently for Bermudan swaptions. The next article, by Duck et al., takes a different tack and presents a kind of turbocharged Longstaff and Schwartz Monte Carlo model for American options. The key insight is to set up the problem in such a way that an extrapolation technique can be applied, allowing one to jump from the results for a modest number of simulated paths to the infinite limit.

The next article, by Bernard et al., introduces a performance-enhancing approximation for a different kind of valuation problem. In their case, it is an approximation to the Laplace transform of the probability distribution governing the expiration day value of an option's underlying. They illustrate their method to obtain model prices for Parisian options almost instantaneously. Finally, the last article, on a different theme, presents some new information on the use of implied volatilities as forecasts of future realized volatilities. In this case, Giot compares using the VIX and VXN implied volatility indexes against volatility forecasts based on historical returns data, in a value-at-risk application.

The Summer 2005 issue closes out Volume 12 of the *JOD*. ("Lucky 13" starts with the Fall issue.) Once again, we wish to extend season's greetings to all of the new graduates from undergrad and advanced degree programs (as well as congratulating their financial backers, whose cash flow situation is significantly improved by the happy event). Welcome to the real world. It isn't as bad as it looks—at least they pay you for your hard work.

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