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In my last editor's letter, I worried about the uncertainty of the world political situation that seemed inevitably to be leading toward war in Iraq. Amazingly, in three months, the war has come and gone. Of course, considerable uncertainty still remains, but somehow, the exposure to the risk of large shocks on the downside now seems a lot smaller than it was. Even the stock market seems to be perking up. So . . . back to business.

Sometimes several papers are submitted on closely related topics and are ready for publication simultaneously. This time the common theme for four of our five articles is barrier options. Optional contracts that pay off like standard calls and puts only if a specified price barrier is hit (for "in" options) or not hit (for "out" options) prior to maturity are becoming increasingly prevalent in the marketplace. The barrier option concept is also proving to be quite useful in modeling other financial instruments, notably securities that are subject to credit risk. The issuing firm is assumed to exercise its option to default if its net asset value falls below a certain level that can be modeled as a price barrier. However, like the path-dependence created by American exercise, the existence of a price barrier, at which a financial instrument changes character the first time that level is hit, introduces several valuation challenges. One is that closed-form pricing equations are not readily available. Another is that in some cases numerical approximation techniques can require a very large number of calculations to converge to accurate values. A third problem is it is hard to maintain accuracy without sharply increasing the number of calculations when the underlying asset price begins close to the barrier. Finally, there is the problem that the value of a barrier option is often significantly affected by the frequency with which the barrier is monitored. Our first four articles provide valuable results that relate to each of these problems.

The lead article, by Duan, Dudley, Gauthier, and Simonato, presents an extremely versatile, powerful, and computationally efficient valuation technology based on modeling the underlying asset's price movement as a Markov chain on a discretized state space. Their framework allows time-varying volatility according to a GARCH process, one or two barriers of a general form, discrete monitoring, and a straightforward way to increase resolution of the lattice for prices near the barrier. Of course, there is a price to pay for all of this, in terms of an unavoidable amount of complexity in the valuation algorithm. But computers are typically not bothered much by such complexity (as long as it is explained properly to them).

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Next, Kuan and Webber consider barrier options for interest rate processes, which are inherently more challenging than typical stock price processes because of the need to make the current bond prices in the market arbitrage-free in terms of the model. The article shows how to gain considerable computational efficiency by splitting the problem into calculation of the first passage probabilities from the current asset price to the barrier and then valuing the option conditional on hitting the barrier.

In the following article, Rich looks at the standard value-at-risk concept and argues that its focus on the possible loss at a given horizon is not appropriate for horizons beyond the very shortest, because risk managers who monitor firm value more or less continuously will not ignore cases in which asset value breaches the VaR level prior to the horizon date. Applying VaR in that case is more like a barrier option problem than like a European option, whose payoff is not affected by the asset value prior to maturity. Rich proposes "continuous value at risk" (CVaR) as a better measure for longer horizon risk exposure, and shows that ordinary VaR is generally a serious underestimate of the CVaR level corresponding to the specified target probability. Finally, in the last barrier option article, Hui, Lo, and Lee consider the problem of pricing an option whose issuer is subject to default risk. As with the first two articles, one of their major concerns is to allow the barrier to vary over time. A significant accomplishment is that they are able to obtain closed-form valuation equations for vulnerable options under several time-varying barrier specifications.

In the last article in the issue, Chaput and Ederington take a look at an important feature of real world option trading that has not been the focus of much academic research: the fact that many trades, especially those of the largest size, involve combinations of options rather than single contracts. There is no particular reason in the standard Black-Scholes paradigm for an investor to prefer a bull spread or a straddle over a general portfolio of options (or, indeed, over a dynamic trading strategy that replicates a general portfolio of options). Yet, more than half of the largest trades in Eurodollar options are for combination positions. The article documents the prevalence of such trades and offers some perspective on the reasons for this real world phenomenon.

Best wishes to all who are graduating this spring, and especially to those whose *children* are graduating! From either perspective, it is one of the major events in life to be proud of.

Stephen Figlewski
Editor