Analysis of Callable Bull / Bear Contracts

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Abstract

Callable Bull / Bear Contract (CBBC) has grown substantially since it was introduced to the market by the Hong Kong Exchange and Clearing Limited (HKEx) on 12 June 2006. The average daily turnover has increased from below $100 million in the first 12 months after the launch of the market to about $1.4 billion in the first quarter of 2008. Meanwhile, the number of newly listed CBBCs has surged from 29 in the third quarter of 2006 to 323 in the first quarter of 2008. Thus, the pricing and hedging CBBC can be regarded as a billion dollar question nowadays. In fact, the CBBC first appears in Europe where it is called turbo warrant. In some European countries, buying and selling turbo warrants constitutes over 50% of all derivatives trading nowadays. CBBCs are special types of barrier options in which the rebate is calculated as another exotic option. HKEx describes that CBBC is less sensitive to the change in volatility of the underlying asset compared to derivatives warrants or standard option contracts. Hence, it is more suitable for betting the market direction without engaging too much in volatility risk. In this talk, I present the analysis of CBBC based on several market models for stock price dynamics. The most important message is that CBBC can be very sensitive to the volatility risk, which is in a sharp contrast to the message by HKEx, and the sensitivity depends on the model which is used to value the product. Finally, I will talk about possible engineering techniques that may be useful to build a pricing, hedging and risk management system for exotic derivatives, such as CBBC, and the corresponding challenges.

Biography of Speaker

Dr. Wong, Hoi Ying received his PhD in Mathematics from Hong Kong University of Science and Technology in 2001. He started his academic career in the Chinese University of Hong Kong as an assistant lecturer, is now assistant professor of Department of Statistics, and will be advanced to associate professor on 1 August 2008. He also served as Director of MSc in Risk Management Science in 2004-2005, and is now serving as the Coordinator of a joint Risk Management programme between CUHK and Hong Kong Institute of Bankers. He has been consultant of commercial banks and Hong Kong Monetary Authority. His research interest includes derivatives pricing, financial risk management, financial econometrics, interest rate modeling and mathematical finance. His papers published in journals in the fields of finance, mathematics and operational research, such as Mathematical Finance, SIAM on Numerical Analysis, Journal of Complexity, Journal of Derivatives, Journal of Empirical Finance, Journal of Futures Markets, Quantitative Finance, IIE transactions, European Journal of Operational Research, etc.