NICOLE EL KAROUI, École Polytechnique, Paris, France
Derivatives Market: Recent developments in pricing, hedging and measuring market risk exposure

In 1973, Black, Scholes and Merton introduced a revolution in the market risk industry, by stating that the price (for the seller) of a derivatives product is the cost of the hedging strategy. Based on a simple framework they deduced the famous Black–Scholes formula and the associated Delta-hedging strategy.

More sophisticated framework are now used, and a part of the market risk has been transformed into a model risk, given there exists a large family of tractable models allowing to recover observable market data (financial products prices). Risk managers are daily faced with this model risk, in particular in the pricing of exotic products. How to measure it is a challenge of the daily risk management.

Moreover, in more integrated point of view, market authorities now require financial institutions to compute their daily global exposure (Value at Risk) via their own "internal" models. Motivated by this challenge, academic and risk-managers are debating the "best concept" of risk measure (Delbaen *et al.* [?], Foellmer and Schied [?]). The dual representation of these convex functionals yields to a nice interpretation in terms of market tools.

Best adapted than utility maximization criterium, this new tool allows us to develop an unified point of view about pricing and hedging in incomplete markets, including model risk. Classical problems as optimal risk transfer or optimal hedging are studied in this new context, using inf-convolution technics in static or dynamic framework.

References

[1] P. Artzner, F. Delbaen, J. M. Eber and D. Heath, *Coherent Measures of Risk.* Math. Finance **9**(1999), 203–228.

[2] P. Barrieu and N. El Karoui, *Pricing via minimization of risk measures.* In: Paris–Princeton Lectures, to appear, 2006.

[3] F. Bellini and M. Frittelli, *On the Existence of Minimax Martingale Measures.* Math. Finance **12**(2002), 1–21.

[4] H. Föllmer and A. Schied, *Stochastic finance: an introduction in discrete time.* de Gruyter Studies in Mathematics **27**, Walter de Gruyter & Co., Berlin, 2002.

[5] M. Musiela and T. Zariphopoulou, *An Example of Indifference Prices under Exponential Preferences.* Finance Stoch., to appear, 2004.