

The Perils of Parameterization

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Surprisingly, common market practices leave free convexity on the table. Markets trade thousands of underlyings, each one with tens or even hundreds of options, quoted throughout the day. Needless to say, the quotes are not generated manually. They are automated and derived from a functional form with a few parameters. If we know this parameterization, we know in advance that the prices tomorrow of many traded securities will belong to a low dimensional (number of parameters) manifold in a high dimensional (number of securities) space. If the vector of today prices does not belong to the convex hull of the manifold it creates arbitrage. We examine several market practices (recalibration of Black-Scholes or of stochastic volatility models, interest rate interpolation by piecewise constant instantaneous forward rates. . .) and show that many violate the no arbitrage condition.