

Vol, Skew, and Smile Trading

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Abstract

We consider an options market where a market-maker quotes normal implied vols for an out-of-the-money put, an at-the-money straddle, and an equally out-of-the-money call. We suppose that as time moves forward, the market-maker updates the three vol quotes, but the maturity date remains fixed. We further suppose that the updates are the same for the three quotes and that the common update is driftless and continuous over time. In this setting, we show how to arbitrage a market-maker who has too low an ATM implied vol, insufficient slope, or insufficient convexity.