

Maturity and volatility effects on UK smiles Or dying smiling?

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Abstract. The “smile effect” is a result of an empirical observation of the options’ implied volatility with the same expiration date, across different exercise prices. However, its shape has been under discussion seeming to be dependent on the option underlying security. In this paper, and filling up a scarce empirical research on the topic, we used liquid equity options on 9 stocks traded on the *London International Financial Futures and Options Exchange* (LIFFE) between August 1990 and December 1991. We tested two different hypothesis for testing two different phenomena: (1) the increase of the “smile” as maturity approaches; (2) and the association between the smile and the volatility of the underlying stock. In order to estimate implied volatilities for unavailable exercise prices, we modelled the smile using cubic B-spline curves. We found empirical support for the smile intensification (the U-shape is more pronounced) as maturity approaches as well as when volatility rises. However, we found two major sources of disagreement with the literature on stochastic volatility models. First, as maturity approaches, out-of-the-money options’ implied volatility tends to be higher than the implied volatility of in-the-money options. Second, as the volatility of the underlying asset increases, the implied volatility of in-the-money options tends to be higher than implied volatility of out-of-the-money options.

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