

FX Options: Volatility Based Pricing

Limitations of Fixed Point Pricing Model

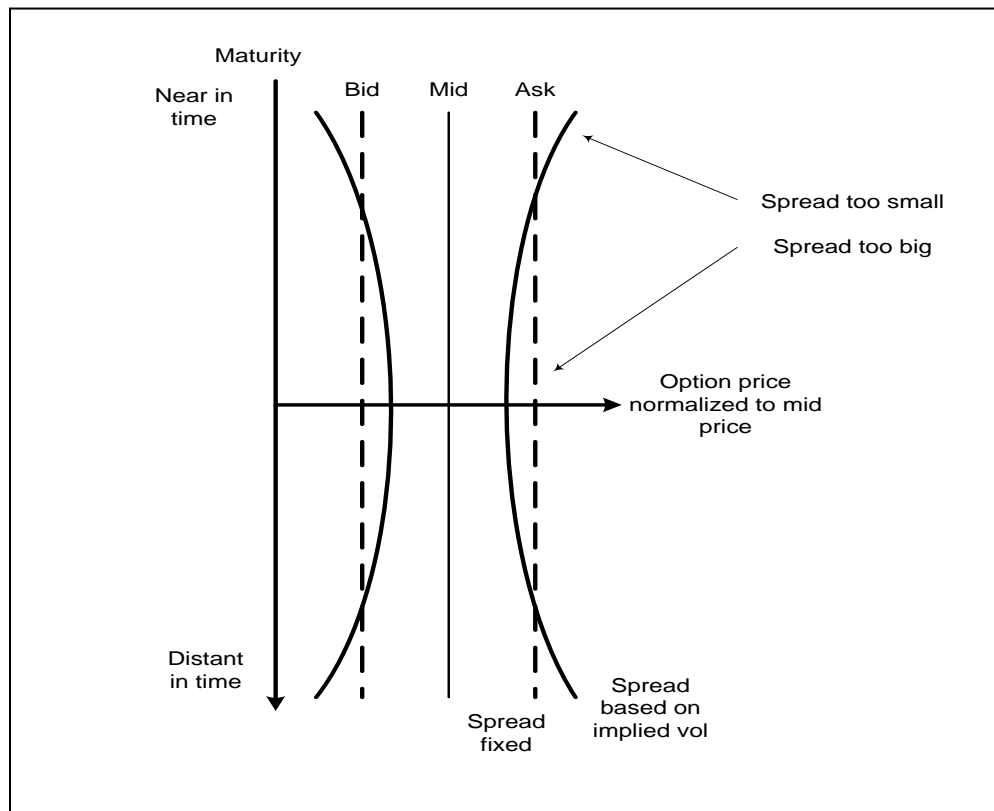
- Until Q1 2009, Saxo's pricing of options was based on mid prices, with addition of a fixed point spread regardless of time to maturity or delta.
- The spread on options was constant in fixed pip terms irrespective of a realistic market volatility spread.
- As a consequence the spread may be too wide or narrow. This method of pricing is not market standard.
- Market standard is to use a pip spread that varies due to varying volatility spreads.
- Options market making professionals always trade options in volatility terms, i.e. options are always delta neutral in that fx spot hedges in appropriate notional amounts accompany all option trades.
- This discrepancy in pricing terms between the interbank market standard and the bank to client approach used by Saxo resulted in Saxo only being able to stream prices for options in 1 week to 3 month maturities and in a range of 10 - 80 delta (with other prices on RFQ only)

Volatility Based Pricing Model

Implementing volatility based pricing requires:

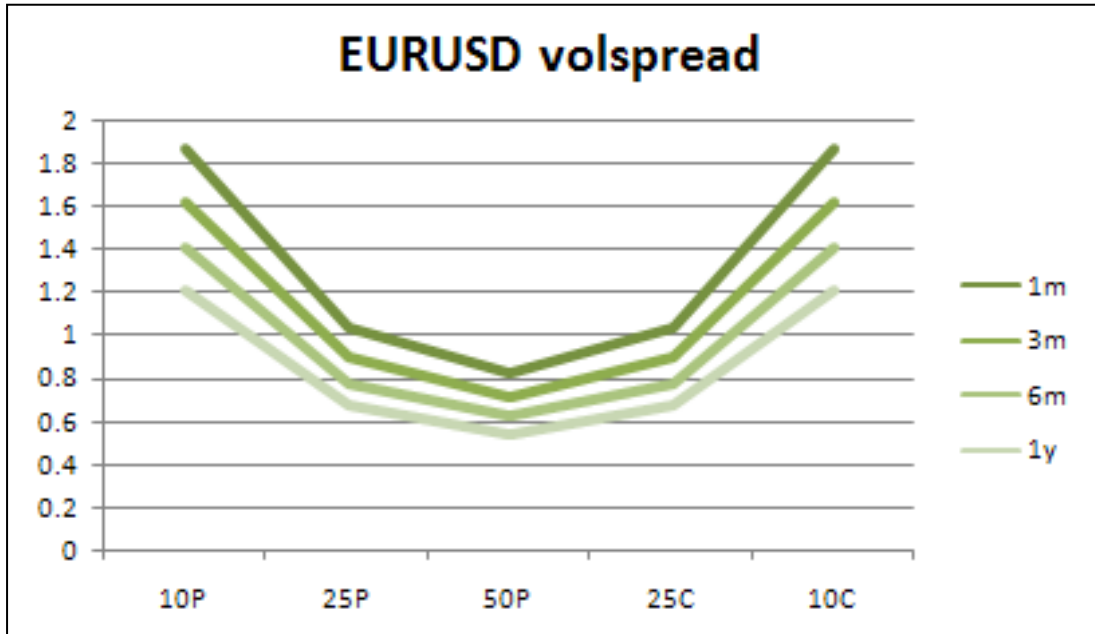
- Interpolation of the bid and offer implied volatility of an option, given the strike price, current price of the underlying instrument, and maturity terms of the option as inputs.
- Calculating bid/ask option prices in pip terms based on the interpolated bid and offer implied volatility.

Spread in Points based on Bid / Offer Vols vs. Fixed Point Spread



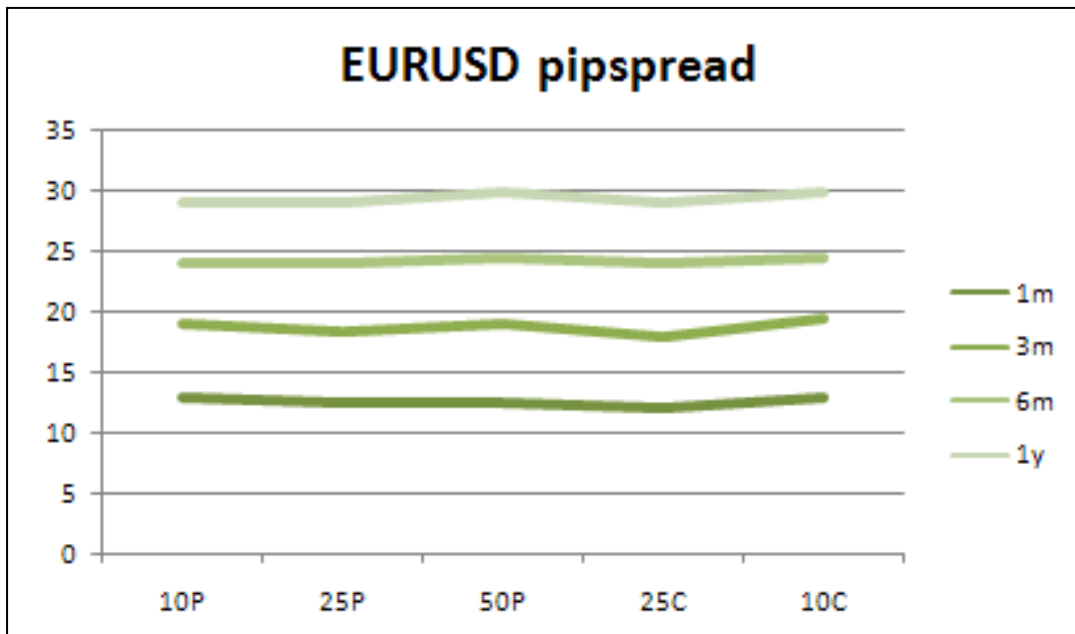
The solid curved lines represent a spread in points based on bid / offer vols, which matches pricing in the interbank market. The dashed lines represent a fixed point spread across maturities, which does not.

EUR USD Bid/Offer Volatility Spread



Price spread in volatility terms is typically narrower for longer dated maturities.

EURUSD Bid/Offer Pip Spread



Price spread in pip terms is naturally wider for longer dated maturities.

Advantages of new model

- More accurate pricing method
- Better pricing transparency in that tradable prices for RFQs are closer to indicative prices
- Market standard pricing method
- Live streaming prices can be extended across a broader range of maturities
- No steps in spread changes (smoother changes)