



ORC SOFTWARE ADDRESSES PRICING FRAMEWORK SHORT-COMINGS FOR **SHORT-TERM INTEREST RATE (STIR) OPTIONS**



Traders reacting to latest market volatility and looking for an advanced pricing framework to model Eurodollar options and other short-term interest rate (STIR) products are migrating to Orc Software's Normal Distribution Model. This article looks at why customer requirements are changing with insight provided by Orc Software Senior Product Manager and volatility specialist, Markus Kämpe. Edited by Annie Walsh, Orc Software's Chief Marketing Officer.

Unprecedented levels of volatility persisting in many markets have simultaneously presented traders with their greatest challenges and opportunities.

Increasingly, risk mitigation of those challenges and maximizing those opportunities is a function of the quality of underlying analytics, particularly as many of today's traders have not been subjected to such extreme levels of volatility. For a large number, making necessary behavioral changes to their trading strategy is tantamount to success.

Altering trading behavior amid market turmoil undeniably presents many challenges for any financial firm, trading desk or individual trader. As each day reveals yet another financial precipice in one or more corners of the market, the task at hand is definitely not for the faint-hearted. Trading technology provider Orc Software is working to support the latest trading demands; first up delivering an alternative pricing model framework to help traders retain competitive edge when trading Short Term Interest Rate (STIR) options.

"Orc's latest development release is an antidote for the market shortcoming's associated with pricing frameworks for short-term interest rate futures and options," says Markus Kämpe, Senior Product Manager at Orc Software. "Although market makers trading for example Euribor and Eurodollar have run into increased pricing issues as a result of the more recent market volatility, structural problems associated with

pricing frameworks actually originate from the time when STIR options started to trade."

The Eurodollar market has been heavily affected by a number of converging market factors, a catalyst for which was the sub-prime mortgage crisis in the U.S. for which cracks started to first appear in early 2008 and really took off later in the year with, for example, a 60+ bps intra-day trading range for the front Eurodollar future the day Lehman Brothers fears became a reality.

All too frequent headlines confirm that handling extreme volatility from the changes and uncertainty concerning interest rates, especially short-term interest rates driven by the Central Banks rates of intervention, has resulted in some real headaches for trading houses.

To cope with the recent volatile market conditions, STIR options traders are spending disproportionate amounts of their time updating volatility surfaces keeping their fair values in line with market to handle heightened market swings rather than focusing on the next move.

Commencing early in 2008 Orc Software began fielding enquiries from Chicago and London-based market making firms requesting greater sophistication in pricing frameworks than the standard models they were using. The extent of such demand increased markedly by end

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of Q3 during 2008, when at the same time short selling restrictions were imposed by securities regulators around the world, including the U.S.' SEC, the UK's FSA and Australia's ASIC.

Kämpe explains: "Customers were anxious for a better way to model Eurodollar products to meet head-on the daily challenges in keeping up with the demands of the market. They could not afford the time to continuously work volatility surfaces at a constant pace. Orc therefore saw the opportunity to migrate willing customers to a production ready solution they developed in the preceding 1 – 2 years specifically in response to potentially greater market volatility and the demands this would place on traders."

Over time Orc has identified the must-have 'requirements' that address emerging customer needs and overcome the shortfalls of the existing pricing models. Critically, in a constantly moving market, traders need access to correct fair values, correct hedge volumes, and correct risk analysis; consequently making the pricing framework key to underpinning reliable and accurate trading analytics. With intraday interest rate movements becoming increasingly pronounced through late 2008, STIRs traders required an immediate solution.

"A number of Orc customers trading STIR options over a long period had occasionally requested improved analytics to handle pricing and risk," said Kämpe. "Following the launch of Eurodollar options on Globex, however, we saw demand for these requirements escalating to a point where we decided to invest resources and develop an improved method for modeling STIR options."

In short, the market requirements for the STIR options analytics (based on a constant volatility curve) were:

- Symmetry of theoretical prices around at-the-money
- Delta of at-the-money call and put should be equal
- Constant at-the-money straddle prices for moving future

Kämpe continues: "The market standard Black76 pricing model is based on the rate implied from the futures price. This means using an assumption of lognormally distributed rates, therefore introducing asymmetry in the pricing and a need for the trader to frequently work the volatility surface to compensate for pricing model shortcomings. Orc's 'Normal Distribution' Model development is a significant improvement to the standard as it assumes normally distributed rates thus giving natural symmetry in the pricing.

A number of Orc's market making and trading customers in London, New York and Chicago have now completed a relatively smooth migration from 'Market Standard' to 'Normal Distribution' Model for STIR options.

Kämpe adds: "Most traders using Orc for STIR options have been trading these products for a long time and are well versed in working with the yield volatility and view volatility risk in terms of yield volatility. With the

new model, the yield volatility no longer exists as an input, and annualized standard deviation is used instead. Since these numbers significantly differ, the trader will need to familiarize with different levels of uncertainty input

and vega numbers. This has not presented any hurdle for customers as traders were historically converting the yield volatility to annualized standard deviation. The new model has therefore removed this additional task while also improving the modelling of the STIR options."

The end result for customers summed up by Kämpe: "If asked, customers using the latest model would be reluctant to return to the standard model. They have now proven that the Normal Distribution Model provides a more accurate pricing framework applicable for STIR options, thereby enabling them to focus on trading rather than re-working the volatility surface. With less demands on the customer, enhancements to risk management sensitivities have also resulted. It's fair to say the Normal Distribution Model is the new market standard for Orc customers." ■

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