

## Technology innovation

### Numerix

> Numerix's innovations in the realm of pricing and valuation software for credit value adjustment (CVA), meeting the demands of variable annuities while dealing with market volatility and risk complexities in inflation-linked products, makes it the winner of this year's award for technology innovation.

Numerix has introduced solutions that respond to some fundamental shifts in the market, such as the move towards the use of overnight indexed swaps, while improving the integration and usability of its software.

The technology firm has continued to meet the increasing hedging demands associated with variable annuity products from the insurance and pension sectors. It expanded its insurance offering by scaling its Leading Hedge variable annuity platform to increase hedging effectiveness, and included equity indexed and fixed annuities in the platform, which incorporates a 'scriptlet' technology that enables the speedy creation of customised liability-based products ranging from simple life products to more complex variable annuities. The enhancements were designed to provide flexibility in deal structuring and enabled users to access financial instruments across all major asset classes, including hybrids, while running a wider range of pricing scenarios that factor in economic, market and liquidity risks.

Numerix also updated its CrossAsset pricing analytics platform for liquid derivatives, allowing users to quickly and intuitively price the most commonly traded transactions, from exotic bespoke derivatives through to vanilla. "It's like a box of Lego," says an Ottawa-based financial engineer. "We set up the blocks – objects – and connect them together. I don't know how they made it work, but it works. It's impressive."

The new Basel III regulatory environment, which requires CVA to be both marked-to-market and actively hedged, led Numerix to deliver a solution for calculating accurate, almost real-time CVA and potential future exposure, incorporating an accelerated American Monte Carlo simulation. "We had to accelerate the technology to satisfy CVA requirements, so there are multiple levels of innovation," says Jim Jockle, senior vice-president of marketing at Numerix in New York. "There are challenges in the CVA calculations themselves – for instance, taking into consideration implied default probabilities from market sources, how to net positions across entire institutions and how to provide accurate CVA calculations and potential future exposure calculations on top of that."

Building on its cross-asset pricing and risk analytics software, Numerix



Satyam Kancharla



teamed up with Microsoft to deliver improved infrastructure and faster computation speeds with cloud-based solutions that aim to reduce the time taken to model, price and manage complex structured products portfolios. The partnership resulted in Windows Azure, which allows clients to leverage high-performance, cloud-based computing in their Numerix implementations.

"It's about a choice between waiting an hour or two at your desk for the calculations or running Azure on a highly scalable infrastructure," says Satyam Kancharla, New York-based senior vice-president of client solutions at Numerix. "On the quantitative side, it's about keeping ahead of the market in terms of pricing and risk, as well as

traditional technology challenges. We have been at the forefront of tackling both simultaneously in order to ensure the market has the right tools and technology."

The firm responded to the rise in inflation-linked issuance last year by creating new deal types, models and model calibrations, as well as three inflation market models that help capture the volatility that standard approaches fail to address and enable clients to accurately price a wider range of inflation derivatives.

"Inflation as an asset class was a very illiquid market with few observable opportunities to calibrate models, so there were limitations in some of the existing modelling, which affected your mark-to-market and effective risk management," says Kancharla. "Inflation is now much more mainstream than it was a couple of years ago and the inflation market has matured as a result of the demand. We developed inflation models that can capture the entire inflation forward space and the optionality in the market in a single model."

Numerix's flexibility and its integrated cross-asset platform also stand out, says a California-based banker who has been using the firm's models for equity-linked certificates of deposits. "We use Numerix to set up our trades. It is flexible in the choice of model types and payout functions and is integrated with the Bloomberg data sets, which makes it easy for us to set up. It has greater flexibility in terms of customised products and payouts than other systems we've looked at."

A California-based corporate issuer of structured products concurs: "Numerix has been key for us, especially for the valuation of structured products. They keep up with market developments and incorporate them into their products, especially since the financial crisis, with all the resulting volatility, and that's important." ●