VectorRisk

XVA Fact Sheet

FINTECH INNOVATION AWARDS 2016
FINALIST

VectorRisk is an Australian company with customers in Australia, New Zealand, Singapore and the United States that provides cloud based risk software solutions to banks, hedge funds, government and corporate treasuries.

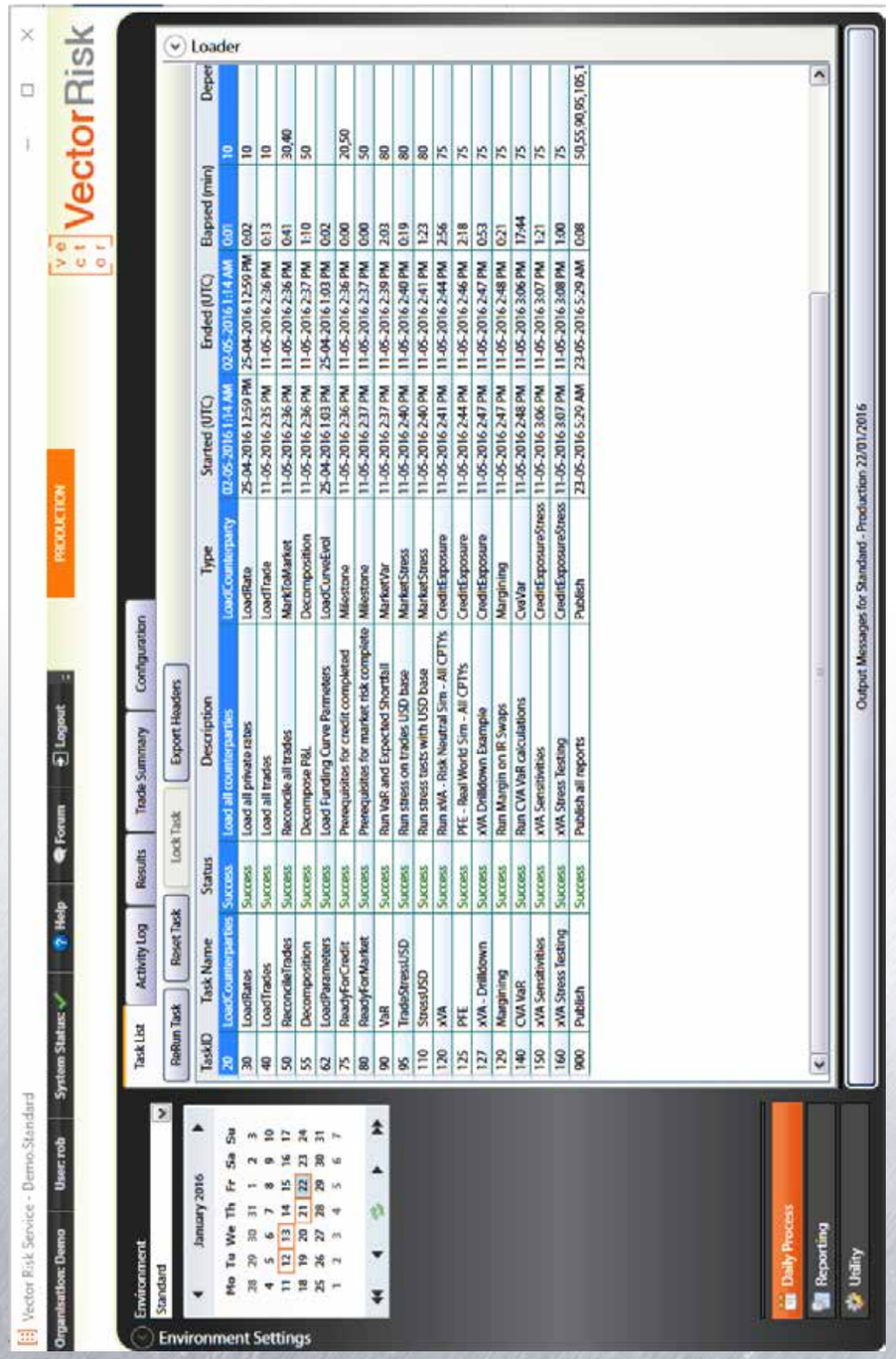
Our risk system calculates market and credit risk exposures in real-time. Our clients have implemented the system as the engine behind credit limit monitoring, collateral stress testing, market VAR and stress, and CVA.

Vector Risk Fact Sheet

- Vector Risk offers a comprehensive xVA service for regulatory and trading requirements, covering all the main derivative asset classes and products.
- Our multi-tenancy cloud solution (Microsoft Azure) vastly reduces IT costs, implementation timeframes and project risk. Put simply, the solution is inexpensive.
- Calculation of xVA measures such as CVA, Bilateral CVA, DVA, FVA, Counterparty FVA using market standard modelling
- Extremely efficient calculation of xVA sensitivities and stress testing; and SA-CVA.
- Clients can also use their own market data (private rates)
- The architecture fully separates the risk engine from the workflow and GUI via web services. So you can use the workflow to organize all the calculations for, e.g., a daily process, or call directly into the risk engine for stateless, real-time calculations.
- xVA calculations are available now for impact assessment or subscription.
- The pricing and risk analytics are proven inside large banks and used by Big 5 accounting firms, such as KPMG, for auditing
- We also have comprehensive internal model offerings for credit risk capital, IMM and PFE (Potential Future Exposure); and our solution now offers comprehensive Basel III support, including SACCR, FRTB SMA, IMA and SA-CVA.

FINTECH INNOVATION AWARDS 2016 FINALIST

FIGURE 1:
VECTOR RISK DAILY WORKFLOW – SAMPLE TASK LIST WITH XVA TASKS



Market Standard

XVA Modelling

The Vector Risk cloud-based risk analytics service provides industry standard portfolio xVA calculations, correctly taking into account netting/economic offset legal agreements, collateral and margining, within a full Monte Carlo framework, across all major asset classes and product types:

- Risk neutral evolution for risk factors where implied volatilities are available
- Correlated default (wrong way risk) modelling
- Dynamical (path-dependent) collateral (CSA) and margining agreement handling
- Automated switchover to OIS-flavoured single and cross-currency zero curves for margined or CSA managed trades/pools
- Correct path handling within the MC framework for trades with triggers, barriers, fixings, etc.
- Detailed drilldown allows the user to investigate evolved rates and trade valuations to analyse unexpected results and to provide regulatory transparency

Integrated Market Data

And Risk Factor Management

xVA calculations require market data streams such as credit spreads, and implied volatilities which may be new to vanilla derivative houses. In addition, substantial historical data can be required in order to parameterise stochastic processes for risk factors where risk neutral evolution isn't possible. Finally, there is a lot of work required in order to determine stochastic processes and parameters for the relevant risk factors, and to deal with data gaps and curve redirection and proxying. Subscribers to the Vector Risk service can take advantage of our integrated curve building, parameter and correlation estimation and risk factor management support:

- Automated curve building:
  - o Swap and bond zero curves
  - o Single currency basis (projection) curves
  - o FX zero curves
  - o OIS flavoured discount curves
- Risk neutral process calibration
- Parameter and correlation estimation from historical data
- Automated curve redirection: proxy, override and basis (driver) curve rules

FIGURE 2:
XVA SUMMARY REPORT

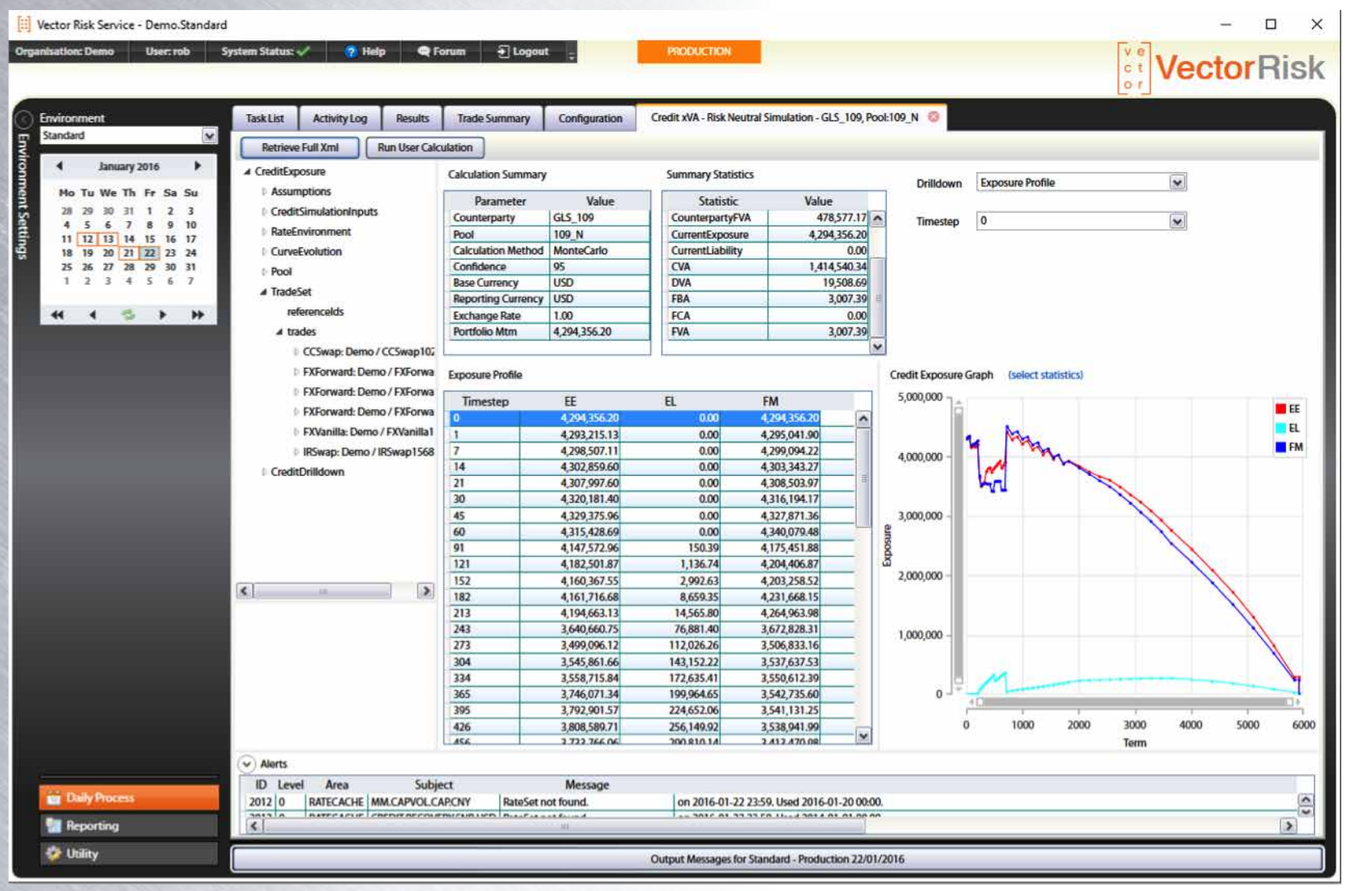


FIGURE 3: XVA SAMPLE LEGAL ENTITY LEVEL DETAILS SCREEN

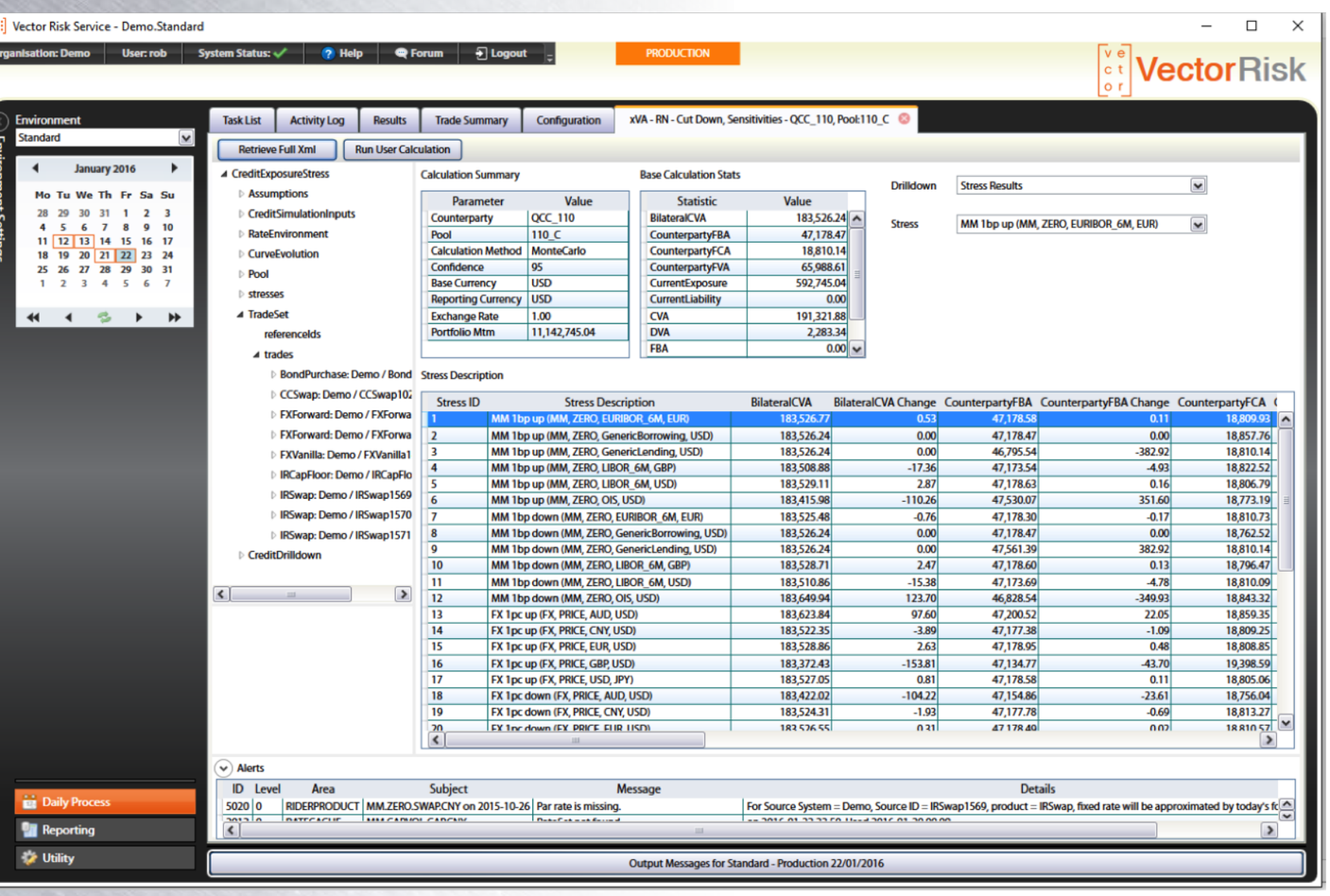
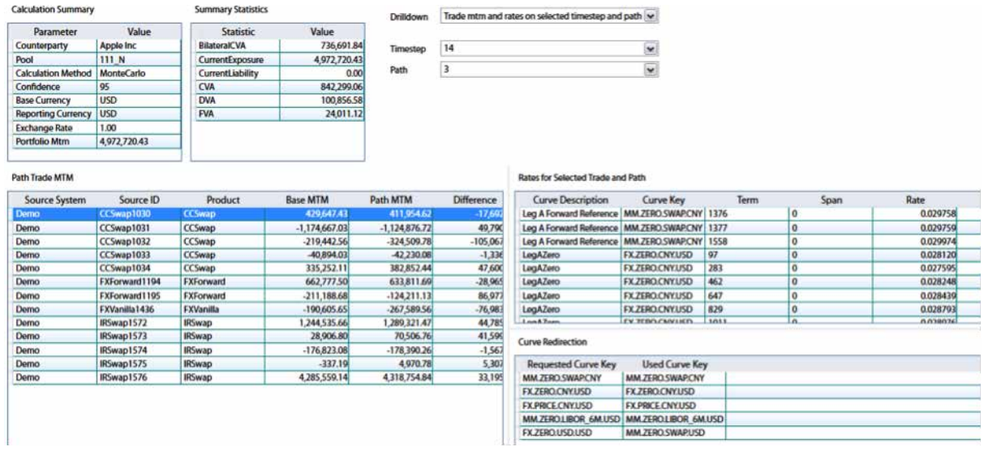
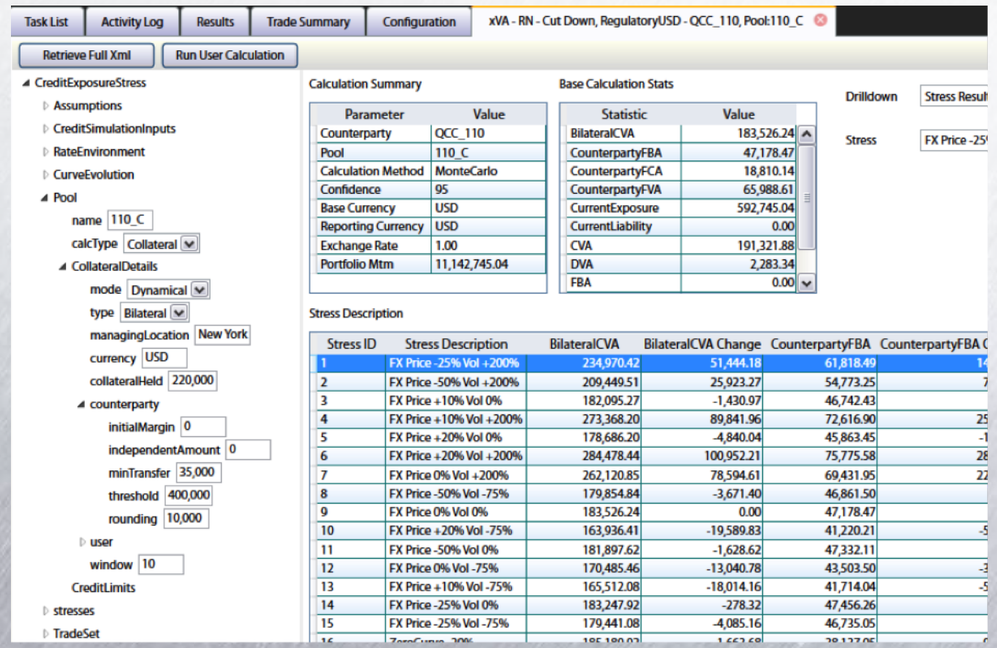


FIGURE 4: XVA SENSITIVITIES SAMPLE DETAILS SCREEN

FIGURE 5: XVA STRESS TESTING SAMPLE DETAILS SCREEN



All Vector Risk details screens allow the user to modify any of the counterparty, trade, market or assumption data in the tree and re-run the calculation; and to drill down into the calculations to see details of every evolved rate and trade valuation, along every simulation path, at every credit node (maturity) and under every stress test:



Unrivalled Performance

For Full Portfolio XVA Simulations

The Vector Risk cloud-based risk analytics service is based on industry leading vector code. All aspects of the simulation are vectorised to achieve unrivalled performance. Cloud delivery means that cost of ownership is reduced even further: our clients get the power they need, when they need it, at a fraction of the price that they would have to pay for internal deployments

CVA benchmark (5000 path Monte Carlo):	
Counterparties:	2000
Trades:	150,000 (60% swaps, 10% options, 30% FX)
Trade valuations:	32,709,985,689
Cashflow valuations:	698,835,209,270
CPU cores:	80
Run time:	**22 MINUTES**

[EFFICIENT XVA STRESS TESTING AND SENSITIVITIES]

By making efficient re-use of calculations, we are able to run hundreds of xVA stress tests or sensitivities in a fraction of the time that brute force re-calculation would require. For example, in a large counterparty portfolio, the xVA measures may depend on around one hundred risk factors: spot rates, interest rate curves, volatilities, credit spreads, etc. However, the time taken to compute all of the xVA sensitivities (bumping each of the risk factors up and down, for instance), is only around five times as long as the original xVA calculation. This makes the calculation of xVA sensitivities, stress tests and VaR, as well as regulatory CVA capital calculations, very feasible and affordable, even for banks with hundreds of thousands of contracts.

"Private Cloud" options are also available.

VectorRisk

Head Office: Vector Risk P/L
Suite 3, Level 2, South Tower
1-5 Railway Street, Chatswood
NSW 2067
AUSTRALIA

Office Phone: +61 2 9409 4600

www.vectorrisk.com