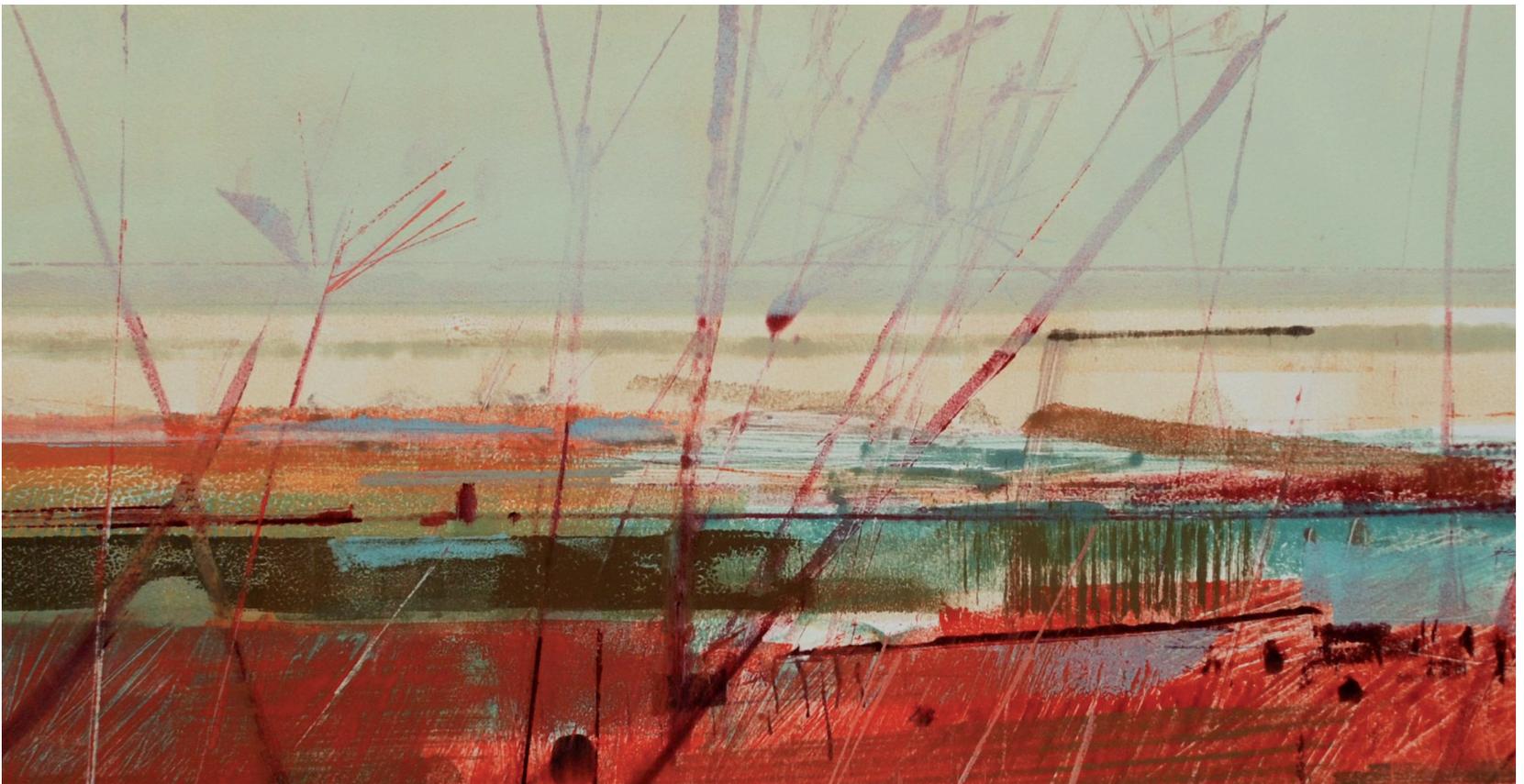


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# Risk

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Numerix takes first place for  
CVA, FVA & DVA Calculation  
for third consecutive year

**Risk**  
TECHNOLOGY RANKINGS  
**2013**

  
numerix

Technology vendors have had their hands full adapting their systems to comply with new regulations, and meeting customer demands for greater speed. In this challenging environment, Murex moved back to first place, with Misys a close second. By **Joe Rennison**, with research by **Max Chambers**

# Adapt and comply

Vendors of risk management and derivatives trading technology, like everyone else involved in financial markets, have spent the past three years closely reading every proposed regulation, attempting to interpret every nuance and contradiction, and trying to decipher the possible implications. Like everyone else, they have faced a dilemma – start preparing now and risk getting it wrong, or hold off until the final rules are published and risk not having enough time to implement the changes. But, for a technology firm, the consequences of getting it wrong are stark: pour money into research and development, only to find a particular requirement is fundamentally altered or scrapped, and it could spell financial disaster.

The past year has provided some real certainty, and enabled those firms that got the balance right to prosper. Dodd-Frank reporting rules are in force, with Europe to follow early next year, the first mandatory clearing obligations have been introduced for certain products in the US, and the swap execution facility (Sef) framework has been rolled out. All of a sudden, the need for margin calculation engines, sophisticated collateral management systems, pre-trade credit limit infrastructure and regulatory reporting capabilities has become unavoidable for any derivatives user.

“There is more certainty on the regulatory side now with clearing and Sefs, so we are seeing a focus on execution in 2014, bringing the methodologies into production, whereas in the past two to three years it was a lot of wait and watch,” says Steven O’Hanlon, president and chief executive of Numerix, a New York-based cross-asset analytics provider. “Our focus has been to bring the methodologies and technology side of things to production level, governing limits, running pre-trade confirmation, pre-trade limit checks for credit valuation adjustment (CVA) and debit valuation adjustment.”

A browse through *Risk’s* software survey this year (*Risk* December 2013, pages 64–69) shows many firms have adapted their offerings to meet the new regulatory reality, with new functionality including swap data repository information analytics, central counterparty margin calculator tools, legal entity and trade identifier management software, pre-trade checking capabilities, and enhanced collateral, liquidity and funding tools.

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But there are still plenty of areas of uncertainty. For instance, rules on the Basel III CVA capital charge are complete, but different regulators have opted to take slightly different approaches in their implementations. In Europe, rule-makers included a CVA exemption for transactions with corporate, sovereign and pension fund counterparties in the fourth Capital Requirements Directive and Regulation, the implementing legislation for Basel III in the European Union. However, some national regulators – including Germany’s Bundesanstalt für Finanzdienstleistungsaufsicht – are considering a capital add-on to compensate for the exemption via a Pillar II charge (*Risk* July 2013, pages 12–17, [www.risk.net/2277765](http://www.risk.net/2277765)).

Meanwhile, US and Canadian regulators decided not to follow suit on specific carve-outs, but instead opted to exempt



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non-credit hedges meant to reduce CVA exposures from market risk capital rules – a bone of contention in the original Basel III text ([www.risk.net/2279269](http://www.risk.net/2279269)). That creates complexities for risk management technology vendors – particularly as the rules will come into force in Europe, Canada and the US from the start of 2014.

But there are some things vendors and their clients know for sure – the various rules will require firms to have more computing power than ever. For instance, determining CVA capital numbers for a business can involve a mind-boggling number of individual calculations, particularly if a bank is using advanced internal models. One vendor estimates a CVA calculation for a portfolio held by a medium-sized bank would involve as many as 20 billion computations.

On top of CVA, a potential transaction would need to be assessed for funding and liquidity, as well as other regulatory and

internal return metrics. Based on the details of the credit support annex signed with that counterparty, pricing may also be adjusted to reflect the cheapest-to-deliver collateral, which in turn determines the discount curves used to value the trade. All of this also needs to be put into the context of the overall portfolio and firm-wide risk-weighted assets, with the results passed back to the trader in as close to real time as possible. The ability to conduct this type of pre-trade checking has been a major focus for technology vendors and their clients over the past year.

“It used to be that people looked at credit risk, at market risk and at compliance rules separately and by asset class. Now the regulations are basically encouraging firms to be much smarter at the pre-trade level,” says Boris Lipiainen, London-based global head of product management at Misy, which finished second in this year’s rankings, with

11.2% of the overall vote. “People are saying, ‘If our trading activities have implications for our capital, our risk-return profile and our credit profile, why don’t we look at it as a business?’. If firms are able to check the impact a trade would have on a portfolio across liquidity, credit risk and market risk factors, then they would probably make much better trading decisions.”

This has forced firms to rethink how they implement and use trading and risk systems, with a greater focus on consistency. “A very consistent view of risk is a necessity. Putting an isolated market risk system into the front office and adding credit risk with a separate system afterwards just isn’t appropriate anymore. The analysis needs to be integrated, from input data to output analytics across risk types,” says Neil Bartlett, chief technical officer at IBM Risk Analytics.

Demand for pre-trade checks has also focused technology firms on enhancing computing power and speed. “For instance, a bank might compute CVA on a portfolio basis overnight and then calculate pre-deal incremental CVA checks in the space of a second. So that would involve tens of billions of computations in, say, an hour or less, and then for pre-deal checks it would involve several million computations. To do those calculations in that kind of time frame, you need to apply parallelism to it – and a very high degree of parallelism,” says Lipiainen.

One answer has been to make greater use of graphical processing units (GPUs). Developed initially for the computer gaming industry, GPUs have been increasingly adopted by banks and technology vendors to improve the speed of complex, multi-step processes – such as Monte Carlo simulations, which require huge numbers of calculations to be conducted at the same time.

“GPUs have been a major enabler for us. Thanks to this technology, we have been able to deliver impressive performance for analytics in pricing and risk,” says Maroun Edde, Paris-based group chief executive of Murex, which topped this year’s rankings with 11.5% of the overall vote. “In addition, most banks and vendors maintain legacy codes in their analytics library. Going for GPUs is not only a programming language transfer exercise – it is a complete rethinking of the calculation chain, isolating the tasks that can be

### Enterprise-wide risk management

Credit valuation adjustment/debit valuation adjustment/funding valuation adjustment calculation

2013	2012	Vendor	%
1	1	Numerix	12.6
2	2	Murex	12.4
3	3	Misys	11.2
4	4	IBM Risk Analytics	11.1
5	5	Calypso	9.2

parallelised, and creating additional layers of parallelisation by grouping computations sharing common features. We did this at Murex on our entire 10-year-old analytical library. It resulted in impressive speed-up factors on the front-office side, market risk and enterprise risk management.”

The improvements in speed depend on the assignment – and conventional central processing units may be better for sequential tasks – but vendors talk about certain complex calculations being cut from hours to minutes. GPUs aren’t the only option, though – a new generation of parallel processing chips and so-called field-programmable gate arrays are also being adopted to enhance performance.

This kind of computing power needs huge amounts of data inputs, in turn prompting developments in data collection, analysis and storage – for instance, through use of in-memory databases.

In fact, real-time data and analytics have become increasingly important to financial institutions in a variety of ways. Firms are now required to capture huge amounts of information quickly, consolidate that data across geographies and business lines, and then report it to regulators. That includes the reporting of swap data to multiple repositories – which in turn involves generation, management and distribution of unique legal entity and trade identifiers, as well as having systems that can complete multiple data fields for swap data reports. These fields can differ from repository to repository, making the task more complex for derivatives users.

Other examples include the aggregation, cleaning and reporting of vast amounts of liquidity and funding data across various business units to meet liquidity reporting requirements. A key challenge is putting all this data into a consistent format, vendors say.

“Regulators need the data in a transparent and granular format, so you need to make sure the way the information is transferred in the bank is the same across different departments. The volume of regulatory reporting has increased a lot – from

reporting swap transactions through to reporting internal model method capital requirements. Then, different regulators may want different things at different times. They need to be able to get that information for regulators at the drop of a hat. Ensuring data is consistent across the bank is a big challenge,” says Dan Travers, vice-president in product management for SunGard’s capital markets business.

The huge demands on data collection and storage have encouraged more clients to consider cloud-based solutions, says Numerix’s O’Hanlon. This makes sense given the huge costs associated with increasing the number of servers onsite, although security concerns about hosting proprietary data outside the firm has hampered the take-up to some extent.

“A trader submits a query and it still hits the data centre. The only element that is different is those cores are not on the premises but somewhere else in the cloud and the sensitive customer data never leaves the institution. That is the first foray banks are looking at with regard to the cloud,” says O’Hanlon. “When you start looking at these requirements, they come with a need for huge cores and the significant costs of a 16-core server, plus air conditioning and maintenance, and so on. So, as people are ratcheting it up, they look to the cloud, where you have thousands of cores available to call back these calculations, rather than being subject to internal hardware constraints.”

These developments are likely to continue into 2014. Next year will see the roll-out of mandatory reporting in Europe, plus greater clarity on the various margining and segregation models used by clearing houses under the European Market Infrastructure Regulation – revelations that are likely to require further adaptations to vendor systems. The Basel III regime will also be developed further, with final rules on the leverage ratio and capital treatment of bank central counterparty exposures. It all points to more work for technology firms.

“Once there is clarity, firms themselves have to make business decisions. The buzz is settling down now and people are making more decisions, and I think that will happen more over the coming year,” says O’Hanlon.

For some, though, the uncertainty over the regulatory environment and the rapid roll-out of various rules has proved a distraction from actually managing risk.

“There has been so much regulation, and it is so expensive, that people get consumed by just building the programmes for compliance, and that to me is a bit of a problem. People need to be focused on managing their business and managing the risk. If they get too focused on the compliance aspect of it, then there is no guarantee they won’t fall into the same trap in the future,” says Lipiainen of Misys. ■

### How the poll was conducted

Risk polled thousands of banks, hedge funds, pension funds, insurance companies and corporate treasurers for this year’s technology rankings, and received 1,380 valid responses.

Respondents were asked to vote for the technology vendors that provide the best product offering across a number of categories, including enterprise risk management, risk capital calculation, trading systems, and pricing and analytics.

Participants were asked to base their votes on

functionality, usability, performance, return on investment and reliability. Nominated technology companies were awarded three points for a first-choice vote, two for a second-choice vote and one point for a third-choice vote.

Only technology end-users were allowed to vote. Risk conducted a comprehensive due-diligence process and disqualified any votes that were felt to be unfair. These include people voting for their own firm, or relatives of someone who

works in that company voting for the firm, multiple votes from the same person, multiple votes from the same IP address, proxy votes on behalf of customers, votes by people who choose the same firm indiscriminately throughout the poll, votes by people clearly not involved in the business areas covered by the poll, and block votes from groups of people on the same desk at the same institution voting for the same firm. The editor’s decision is final in determining the validity of votes.

**OVERALL**

**Overall**

2013	2012	Vendor	%
1	2	Murex	11.5
2	1	Misys	11.2
3	4	SunGard	8.7
4	3	Calypso	8.1
5	6	Bloomberg	7.8
6	5	IBM Risk Analytics	6.8
<b>7</b>	<b>7</b>	<b>Numerix</b>	<b>5.7</b>
8	8	Moody's Analytics	5.4
9	9	SAS	5.1
10		Oracle	4.5

**Pricing and analytics**

2013	2012	Vendor	%
1	1	Murex	14.7
2	4	Misys	13.7
3	3	Savvysoft	11.1
4	5	Bloomberg	10.2
<b>5</b>	<b>2</b>	<b>Numerix</b>	<b>9.5</b>
6	6	Calypso	7.4
7		SunGard	6.8
8	7	Fincad	6.1
9	8	Pricing Partners	5.6
10		Markit	4.9

**Enterprise-wide risk management – market, credit, counterparty, liquidity, aggregation, Basel III**

2013	2012	Vendor	%
1	2	Misys	13.8
2	3	Murex	13.5
3	1	IBM Risk Analytics	12.4
4	4	SunGard	12.1
5	6	Calypso	9.6
6	5	Moody's Analytics	8.6
7	8	Bloomberg	7.2
<b>8</b>	<b>7</b>	<b>Numerix</b>	<b>6.1</b>
9	10	Oracle	4.6
10		SAS	4.5

**Pricing and analytics**

**Commodities**

2013	2012	Vendor	%
1	2	Murex	16.1
2	1	Bloomberg	15.5
3		Misys	11.4
4	4	Savvysoft	10.1
<b>5</b>	<b>3</b>	<b>Numerix</b>	<b>9.5</b>

**Credit**

2013	2012	Vendor	%
1	1	Murex	14.8
2	4	Savvysoft	11.1
3	3	Bloomberg	10.9
4		Misys	10.5
<b>5</b>	<b>2</b>	<b>Numerix</b>	<b>10.1</b>

**Equities**

2013	2012	Vendor	%
1	1	Misys	16.7
2	2	Murex	15.6
3	5	Bloomberg	11.6
4	4	Savvysoft	10.5
<b>5</b>	<b>3</b>	<b>Numerix</b>	<b>9.4</b>

**Forex**

2013	2012	Vendor	%
1	1	Murex	15.9
2	2	Misys	14.3
3	4	Bloomberg	12.1
4	5	Savvysoft	10.7
<b>5</b>	<b>3</b>	<b>Numerix</b>	<b>8.6</b>

**Inflation**

2013	2012	Vendor	%
1	3	Murex	15.0
2	2	Misys	14.2
3=		Bloomberg	12.3
3=	1	Savvysoft	12.3
<b>5</b>	<b>4</b>	<b>Numerix</b>	<b>9.3</b>

**Rates**

2013	2012	Vendor	%
1		Bloomberg	15.2
2	1	Savvysoft	13.4
3	3	Murex	11.3
4	4	Misys	10.4
<b>5</b>	<b>2</b>	<b>Numerix</b>	<b>9.2</b>

**Structured products**

2013	2012	Vendor	%
<b>1</b>	<b>1</b>	<b>Numerix</b>	<b>16.5</b>
2	3	Savvysoft	15.1
3		Misys	11.3
4	5	Calypso	10.2
5	2	Murex	10.1

**Cross-asset**

2013	2012	Vendor	%
1	4	Savvysoft	14.8
2	2	Murex	13.6
<b>3</b>	<b>1</b>	<b>Numerix</b>	<b>12.2</b>
4	5	Misys	11.9
5	3	Calypso	10.4