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Innovation in technology

ISDA

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International Swaps and Derivatives Association

Capturing variability in capital calculations, a problem that has vexed regulators and banks alike, has been resolved by a natty piece of kit from an unlikely candidate.

The kit in question – a quantitative engine named Perun – is among the latest tech innovations to spin out of the International Swaps and Derivatives Association, a once-traditional trade body that these days looks increasingly like a fintech.

ISDA developed Perun to explain differences in capital calculations required under Basel III rules, due for global implementation by the start of 2023. The engine is central to ISDA's standardised approach (SA) capital model benchmarking project and has already been deployed by 70 banks and 16 regulators.

"Where ISDA has taken this initiative is quite impressive," says David Phillips, senior manager in traded risk measurement at the Bank of England (BoE). "Historically, benchmarking exercises have proved to be of limited value to the banks that participated in them."

A key difference is that Perun builds on several ISDA initiatives that are transforming the way the trade group works with banks and regulators. Its success owes much to the group's development of the common risk interchange format (Crif), a data standard that represents trades by systematically communicating risk factors across nine data fields – including trade size, asset class, currency and tenor – information that was previously shared by email or in proprietary formats.

Originally developed for Simm, ISDA's standard initial margin model for non-cleared transactions, Crif has been expanded to other instruments and asset classes to address challenges posed by such regulatory requirements as the standardised approach to counterparty credit risk and the Fundamental Review of the Trading Book (FRTB).

"This sets ISDA benchmarking apart from the usual internal models benchmarking," says Holger van Bargen, manager in group strategic analytics at Deutsche Bank. He contends that ISDA's aggregation engine and data standards enable it to address a key challenge common to many benchmarking exercises: a detailed understanding of the deviations between contributing firms.

"This is different now, because banks can see how their results differ from other banks in a much more structured way," says BoE's Phillips. "It means they are much better placed to understand why deviations have arisen and therefore take the appropriate actions. It also points the way forward for how to improve benchmarking exercises more generally, ie, not just for standardised approaches."

"There have been a number of instances where we have been working to provide mutualised solutions that are cheaper for the industry than if each firm developed its own solution. I think, in many respects, we are looking a bit like a fintech"

Scott O'Malia, ISDA

The benchmarking exercise itself grew initially from a UK Prudential Regulation Authority initiative. "As part of our implementation of the FRTB, we wanted to benchmark the new standardised approach," says Phillips. "ISDA then helpfully got involved and became a central point of co-ordination between representatives from around 15 banks."

Starting with a small UK pilot group in 2018, Perun has been used to deliver the analysis since 2020. Now in its fourth phase, running up to June 2022, it has expanded in scope to cover other jurisdictions. The Federal Reserve Board, for example, will use elements of the ISDA benchmarking process – including Crif – as it designs its own hypothetical portfolio exercise as part of FRTB implementation in the US. The Basel market risk group is a consultee.

"They're not just organising meetings," says one market risk manager at a US bank, arguing that ISDA's SA benchmarking initiative has above all illustrated how ISDA is able to diversify its service of the industry in an intermediary role: "Coming up with a tool that a participant can use in our case to benchmark against our own framework is quite something."

Mark Gheerbrant

Old vines, new growth

Since its inception in 1985, ISDA has been more closely linked with developing documentation such as the ISDA master agreement, producing legal opinions on the enforceability of netting and collateral arrangements, and leading advocacy on issues ranging from capital requirements to benchmark reform and everything in between.

Yet in the past few years, the trade body has quietly assembled an impressive arsenal of technology solutions, without which the derivatives industry would struggle to comply with the increased regulatory demands laid down since the financial crisis. These days, ISDA's consistent innovation makes it look more like a tech start-up than a trade association. And rather than being at odds with regulators, supervisors are deploying its tech tools and consuming the data generated by them.

"Maybe in the past we've taken a different approach to regulatory engagement," ISDA chief executive Scott O'Malia tells *Risk.net*. "During Dodd-Frank or the European Market Infrastructure Regulation (Emir), there were a lot of ISDA letters that sought to provide constructive feedback on regulatory proposals and highlight potential challenges. But once the rules were in place, we looked to help market participants with their compliance efforts."

O'Malia says ISDA started down its path of tech innovation when post-financial crisis regulations required mutualised services for trading, clearing and data reporting of derivatives. "There have been a number of instances where we have been working to provide mutualised solutions that are cheaper for the industry than if each firm developed its own solution. I think, in many respects, we are looking a bit like a fintech."

In the process, ISDA needed to build trust with regulators: "We don't take it for granted, for sure," says O'Malia. "They want to know that whatever we're developing, we're not creating a situation where firms are required to use our products."

Perun is the latest pillar in ISDA's tech strategy, accomplished by an in-house development team of fewer than 10 people. The team created the Python-coded Simm and the common domain model (CDM), an open-source code used as a taxonomy to describe derivatives lifecycle events. CDM has similarities with Financial products Markup Language (FpML), ISDA's digital product description for electronic processing of derivatives. In 2019, the group launched ISDA Create, a platform allowing firms to negotiate and execute derivatives documentation online.

"With the CDM, we can describe lifecycle events in their fundamental economic terms in a common and consistent way across all product classes," says O'Malia. "We are now using the CDM in a variety of ways, including to underpin some of the outputs of ISDA Create. So it's all beginning to align and the work holds together."

Ranking file

Three elements have been key to the success of the capital model benchmarking exercise: representing the hypothetical portfolios in an unambiguous manner to ensure trades are booked in the same way; capturing the risk outputs; and automating the analysis to service a large number of participants on a timely basis.

ISDA used its FpML standard to represent the trades unambiguously, and automation of the service was made possible through Perun. But Perun's success hinges on the Crif file.

Without Crif, the benchmarking project wouldn't achieve its level of automation, or the granularity of data to explain variations in capital, say users. Alix Dupuy, head of FRTB models, Societe Generale, describes Crif as a "very efficient and practical tool to identify any divergence or problem in the implementation of FRTB SA".

One market risk manager at a US bank believes Perun has proved invaluable for drilling down to discover whether sensitivities or risk weights might be the cause of discrepancies and for comparing bank submissions, but that the Crif file is "essential to the success of the initiative".

"Its standard format is key to the whole platform. The configuration of the Crif file is where you can see the innovation of being able to standardise entries to yield the capital computation," he argues.

A financial risk quantitative analyst at a European bank concurs: "The crucial part in this exercise was the definition of the Crif file. It makes any input comparable across the industry."

The trade group now estimates that more than 200 firms are using Crif on a regular basis.

"It saves a lot of time," says a risk analytics manager at a North American bank, who estimates that without the Crif file in combination with Perun, his bank would have spent "days or months digging through data trying to understand where the issue is".

The Perun prerogative

With the final elements of the Basel III framework, standardised approaches for the calculation of capital will increase in sophistication

Olivier Miart

Panayiotis Dionysopoulos

and sensitivity. Banks involved in trading activity have to build a whole new suite of standardised approaches for FRTB, credit valuation adjustment and counterparty credit risk calculations. The numbers also form the basis of Basel's output floor, which bars banks from reducing their modelled capital requirements below 72.5% of the amount generated by the revised standardised approaches.

Without ISDA's intervention, banks would need to rely on the cumbersome, iterative process of submissions and recalculations to regulators to meet these requirements. But now, they can receive in advance a whole series of tests specifically designed to cover every aspect of the models – and the results they should get from the tests if their models are working correctly.

The benchmarking comprises a unit test to ensure the fitness of implementation of standardised approaches across firms, in addition to a hypothetical portfolio exercise across more than 100 portfolios. It enables banks to see on an anonymous basis where they are relative to their peers. The exercise then not only identifies but explains any observed variances and co-ordinates remediation. Perun widely automates this process, and allows banks to upload their capital and Crif data and generate results autonomously. Several vendors license the ISDA unit tests.

Banks can identify and correct outliers themselves. In one example, a bank reports that a portfolio of Treasury bonds hedged by credit default swaps led to a capital calculation that diverged from its peers by two-to-three standard deviations. Perun revealed the discrepancy to be caused by using the wrong reference data for the same sovereign on its CDS and bond portfolio, resulting in an improper offset.

ISDA head of analytics Olivier Miart says regulators find the initiative interesting because its aggregated examination tells them what typically drives differences in bank capital for the same hypothetical portfolios.

Although bank calculations of sensitivities are not a significant driver of divergence, portfolio offsetting assumptions and model implementation choices can lead to variations.

In a concept borrowed from Simm, ISDA is exploring a crowdsourcing solution to address inconsistencies in bucketing.

ISDA discusses such outliers with participating banks and regulators. Sometimes regulators step in to clarify the rules and sometimes firms take different approaches to fill the gap, in which case the issue would likely be resolved in FAQs.

ISDA's enterprise has improved on Basel's initial attempts to identify legitimate sources of capital deviations in internal models. "Explaining variation in the output from capital models between participants is where a lot of benchmarking exercises have fallen down," says Mark Gheerbrant, global head of risk and capital at ISDA. Perun enables regulators to monitor progress and implementation to make sure banks in their region are on track to meet upcoming deadlines, he adds.

In future, the benchmarking initiative could be extended to internal models. "Some of the capabilities we've developed from doing this can be applied to internal model benchmarking with the same goals, which are largely to make the processes as efficient and useful as possible," says ISDA head of capital Panayiotis Dionysopoulos.

A new pilot will also see the CDM, together with FpML product descriptions, automate production of Crif files, with the potential to be used in applications for reporting capital and margin amounts to the regulatory community.

"Think of an automated continuous reporting of all the positions in the industry to regulators on a potentially live-stream basis. That's the long-term vision we have," says Miart. "ISDA is currently engaging with a few banks and regulators to prove the idea's feasibility."

In a separate workstream, ISDA is working on a digital regulatory reporting initiative to mutualise trade reporting requirements under Commodity Futures Trading Commission rules and Emir.

Joint purpose

The deployment of Perun is an example of how industry and regulators can collaborate for a better result than if they had worked less co-operatively. Perun has been used as an ISDA internal tool, but moves are now afoot to give regulators and participating banks unfettered access so they can independently use its golden source for analysis. In 2022, most banks participating in ISDA's capital model benchmarking initiative will directly use Perun to validate their model implementations and analyse their results autonomously. As of January 2022, 20 banks were using Perun directly rather than sending their data via ISDA.

The head of regulatory policy at a tier one US bank sees the partnership with supervisors as a two-way street, allowing industry to respond appropriately to regulators on the impact of the new Basel capital requirements: "I think we've seen some significant positive changes from the regulators with regards to calibrations and modifications that just would not have happened had this exercise not taken place."

Since the global financial crisis 14 years ago, regulators have sought to make the derivatives industry a safer place. By using its tech smarts to break the trade body mould, ISDA is helping to make that happen. ■