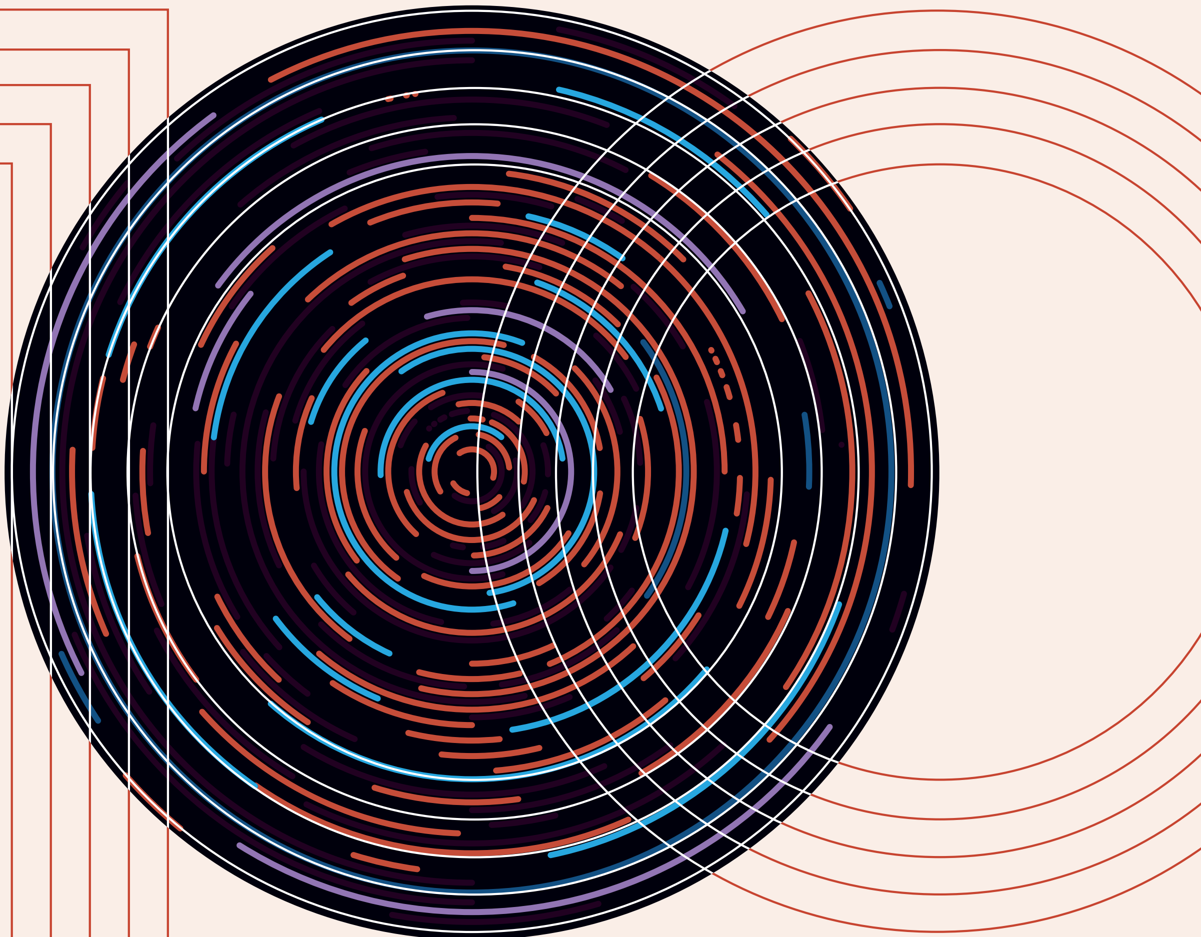
RiskTech 100 2020

Winners' Review



Chartis

Independent. Insightful. Actionable.

Flexibility is key as markets evolve

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This year, as we discussed in our annual *Big Bets* report, we expect major changes in risk technology markets. Faced with significant structural shifts in their core markets, many users of risktech are more closely analyzing the operational value of the tools and technology they engage with. And, as sophisticated artificial intelligence tools and cloud analytics shed their 'exotic' luster, the confusion that surrounded them seems to be dissipating. All of this is leaving financial institutions with a host of new choices, and some fundamental questions about their systems and processes.

Perhaps more than ever, faced with often profound changes to the markets in which they operate, risktech vendors must be flexible, able to adapt and innovative. Equally, after years of hype, financial firms have become more wary of the longevity and reliability of some 'newfangled' solutions, emphasizing the importance of staying true to more established ways of doing things. For vendors, 2020 could be a year of choices with potentially far-reaching repercussions, as well as for the customers they serve.

For nearly 15 years, the Chartis *RiskTech100*® – the most comprehensive independent study of the world's major players in risk and compliance technology – has been assessing the capabilities of risktech vendors worldwide, analyzing their operations, strategies and products, and rewarding their achievements. This year we covered more areas of risk than ever before – recognizing vendors in 59 categories spanning everything from cyber and financial crime to pricing, analytics and regulation. As it does every year, our analysis highlights the strength, versatility and market heft of both established providers and new entrants.

This supplement to the main *RiskTech100*® report examines some of these vendors in more detail, via profiles and interviews with some of their key representatives. As we enter another active year for risk technology, I congratulate the firms recognized in this year's Winners' Review, and hope that readers will enjoy this look at what makes them successful.

Mark Feeley
Research Director, Chartis Research

RiskTech 100 2020

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As overall *RiskTech100®* winner for the fifth consecutive year, FIS continually stands out from the competition, remaining at the forefront of risk technology and demonstrating the company's commitment to solving its clients' evolving risk challenges.

Risk and risk technology markets are changing rapidly, yet FIS continues to respond by developing and incorporating innovative technologies into its offerings and reacting quickly to market movements and new regulations.

"We are thrilled to have been recognized once again by Chartis for the investments we continue to make in leading-edge risk management and compliance solutions." says Martin Boyd, President of Capital Markets Solutions at FIS. "We create secure and scalable innovative technology that modernizes our clients' businesses and positions them for success today and in the future."

The power of emerging technologies such as artificial intelligence (AI), cloud, natural language processing, robotics process automation and blockchain are being employed in FIS offerings across industry sectors, from energy, where AI is analyzing historical energy patterns and trading behavior, to market risk and counterparty credit risk, where machine learning is being used to identify risks and exposure.

Continued Domination Within Market Presence and Functionality

Demonstrating the strength of its business model and powerful value proposition, FIS has also secured the *RiskTech100®* Market Presence and Functionality awards for a fifth consecutive year.

The Fortune 500 technology vendor has an extensive portfolio of software, services and outsourcing offerings for merchants, banks, institutional firms across the buy and sell sides, corporations, insurance companies and more – helping clients manage risk, streamline operations and meet regulatory requirements. The company now serves in excess of 20,000 clients in more than 130 countries and employs 55,000 people worldwide.

With more than 50 years of history rooted in the financial services industry, FIS has one of the most comprehensive risk and compliance solution sets in the industry, covering the entire financial ecosystem. The US-headquartered company prides itself on its best-of-breed risk functionality and its ability to solve complex problems with advanced end-to-end technologies, providing unprecedented efficiency gains for business processes while reducing total cost of ownership.

Its risk coverage includes market risk, credit risk, liquidity risk, cross-asset trading risk, investment risk, asset and liability management and regulatory technology as well as cyber risk, financial crime and fraud. With broad and deep functional coverage across the risk management value chain from loan origination to regulatory reporting and accounting, FIS' solutions cover the full transaction processing lifecycle, risk management and compliance across asset classes.

Last year marked a significant milestone, with the Worldpay acquisition greatly enhancing the company's scale and capabilities. Boyd says: "FIS is uniquely connecting the value chain of commerce and financial services through solutions specifically designed to advance the way the world pays, banks and invests."

"Our world-class capabilities bring immense value to our clients," he continues. "Our ability to combine risk solutions to suit any client's needs is one of our biggest differentiators. We solve our clients' challenges by bringing expertise and data-driven insights across geographies to create a more connected commerce and financial world."

Expanding the Delivery of Data and Analytics Through Risk-as-a-Service

Tough new challenges for risk management require a whole new approach to how financial institutions consume technology and services. Within financial markets, for example, a great deal of complexity is being pushed down the tiers while, at the same time, institutions are tackling cost reduction programs.

In response, FIS is focused on flexible deployment and cloud-based solutions, with its risk-as-a-service (RaaS) model. Growth in its cloud-based RaaS services can be seen across industries such as insurance and energy, while 2019 saw the launch of RaaS Within Capital Markets.

New Category Award Wins: Front-Office Risk Management and Sell Side

Powerful, interconnected forces are driving radical change in capital markets, including technology innovations, new business models, escalating client expectations, stiffer competition and complex regulatory requirements. It is imperative for market participants to adapt, and FIS has been recognized for the technology and risk services it offers to help firms meet these challenges.

FIS' cross-asset solution covers all major risk types, including market, credit and liquidity risk. Its end-to-end solution covers processes from loan origination to balance sheet optimization, while also delivering liquidity management and stress-testing via a single, consolidated, front-to-back technology platform. It also ensures compliance with a wide range of regulatory and reporting requirements.

The company's real-time capabilities gather, cleanse and validate all the market data required for its clients' calculations, providing independent valuations, running calculation models and reporting on results. Its solutions make complex calculations and risk analytics easier and more affordable for buy- and sell-side firms, while delivering the most complex calculations, such as valuation adjustments. Additionally, FIS' solutions enable the alignment of traditional risk silos by supporting current and forthcoming regulations – such as the Fundamental Review of the Trading Book, the standardized approach to counterparty credit risk, uncleared margin rules and the standard initial margin model – from the same technology stack and data.

Its regulatory reporting service is built on its sophisticated balance sheet management platform, providing advanced analytics, a detailed audit trail, drill-down capabilities and the ability to demonstrate 100% accuracy to regulators.

The evolving profile of risk management within financial institutions is leading to trading, portfolio management and risk moving closer together. Covering both the trading and banking book, FIS' integrated services provide a single, enterprise-wide view of risk, with real-time calculations and limit checks, aligning trading, treasury, risk, finance and regulatory reporting.

Boyd elaborates: "Future front-office decisions will be increasingly dependent on the enterprise-wide portfolio. It is imperative to connect the front-office platform with a robust risk solution. Such integration will support user-friendly interfaces that smoothly deliver position and portfolio data to the people who need it. It also streamlines data and processes for efficiencies and insights through the front, middle and back offices – supporting multi-asset class electronic trading and complex investment strategies."

The launch of RaaS Within Capital Markets has been one of the biggest developments for FIS in the past year. "RaaS provides our clients with the flexibility to augment their existing in-house risk functions, or alternatively outsource. It significantly reduces the time taken to adopt the latest risk measures. By investing in well-integrated, multi-asset class technology and cloud services that provide flexibility, we are helping to simplify complex technology landscapes and reducing the cost of ownership, while increasing insight. And, with each component available as a microservice, this provides rapid access to the analytics that clients need – at the point of need."

Leading Insurance and IFRS 17 Solutions

FIS has retained the Insurance and International Financial Reporting Standard (IFRS) 17 awards for the fifth and second consecutive year, respectively. With over 1,000 customers using its insurance platform and customers in more than 70 countries, the company has invaluable insights into customer needs on a truly global basis.

The industry frontrunner has been quick to respond to IFRS 17 regulation and is leading the race to help customers prepare for its introduction in 2022 by providing an end-to-end solution. Boyd comments: "We are uniquely positioned to provide a complete IFRS 17 solution, through actuarial to finance, for all different types of insurance business on a single platform. We partner with many insurers on IFRS 17, and many of our insurance clients around the world use our platform for IFRS 17 compliance."

FIS launched its Enterprise Accounting System (EAS) for IFRS 17 in early 2019 when – in conjunction with its Prophet system – the company added new capabilities to provide an accounting view and subledger. To power EAS, it monitors IFRS 17 changes and has extended its calculation capability.

Martin Boyd, FIS

Within insurance generally, FIS continues to make further improvements to its technology. The additions of AVX and distributed databases in 2019 are driving down the costs of compliance and helping customers deliver results faster.

In the US, momentum has really picked up on Long-Duration Targeted Improvements (LDTI) to US Generally Accepted Accounting Principles, and this has been a strong focus for FIS, enabling insurers to get ahead of the regulation by adding out-of-the box functionality.

With IFRS 17 and LDTI increasingly raising risk management, actuarial and finance to global common standards, FIS also continues to enhance its governance solutions and deliver on the requirements for better processes, more frequent and more complex calculations, and more transparent and consistent reporting.

As seen across the company, its cloud offering continues to mature, with additional services and optimization of infrastructure in the public cloud. FIS plans to continue extending these offerings, using new technology and the efficiencies of the public cloud to drive down costs. Boyd elaborates: "We are continuing to drive cost reductions for our customers, saving insurers up to 30% by moving from on-premise to our managed cloud services."

FIS is also seeing far better organizational alignment within the insurance industry between risk and finance teams, and greater integration of the software these teams are using – driven by IFRS 17 in particular. The company is therefore servicing the rise in use of workflow software that connects systems and automates previously manual processes.

Category Win: Energy Trading – Applications
FIS has displayed its ability to help a wide variety of players in the energy sector with a suite of products to support trading, risk, logistics and the back office. With upwards of 20 years' experience in the energy market, FIS offers a rich and varied product set, covering energy trading and risk management, gas and power operations, as well as trading solutions for credit risk management, market data and treasury. Having won the Energy Trading award for the last two years, FIS has been awarded top spot in the new category of Energy Trading – Applications.

RiskTech 100 2020

FIS

Winners' Circle
The Evolution of a Market Leader

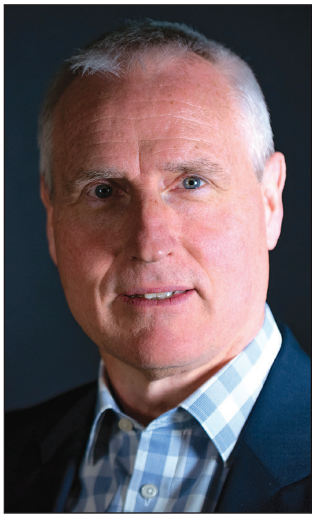
Chartis spoke to FIS President of Capital Market Solutions Martin Boyd about the unbeatable technology giant's continued reign at the top of the *RiskTech100*® and how the company is making the important transition from technology provider to service partner.

FIS has taken the coveted top position in the *RiskTech100*® for five consecutive years – what are the key factors behind this continued success?
Martin Boyd, FIS: For more than 50 years, clients have come to FIS to solve their complex business challenges. We have a long history of developing and delivering solutions specifically for risk, compliance and finance professionals.

A big part of our success therefore lies in the strength of our expertise, along with the breadth and depth of our offerings. Our large and knowledgeable talent pool of employees ensures we are leaders in the markets we serve, enabling us to deliver modern, seamless and secure technology solutions and services. We provide the mission-critical capabilities that our clients need to efficiently scale, run and grow their businesses.

Our truly global technology solutions and services cover the entire financial ecosystem and we serve organizations of all sizes, working with companies that range from small domestic players to regional heavyweights and large, complex global institutions.

The scale of our business also helps us reinvest in our products and stay ahead of our competitors. Our ability to move quickly to help our clients meet regulatory requirements is critical in today's world, and our clients rely on us to stay ahead of the market and make investments that allow them to run their operations more efficiently, while driving down their risk.



Martin Boyd, FIS

FIS therefore aggressively invests in and harnesses technology in innovative ways, solving critical challenges and delivering superior experiences for our customers, while automating complexity.

A truly vital component of our success, underpinning all of these factors, is our fundamental focus on customer needs. Yes, we are always looking ahead in terms of new technologies, regulation and evolving risk techniques, but we also consider the here and now. The breadth of our business means we have unrivalled global insights in this area, and we demonstrate a level of commitment to the success of our clients that is unmatched in the industry.

Risk technology markets are perennially and rapidly changing – what major shifts are currently occurring among your clients?
Martin Boyd: Within capital markets, for the first time since the global financial crisis that began in 2007–08, regulatory requirements are begining to stabilize. As the flow of new mandates slows, the next priority is to implement known regulations as cost-effectively as possible and to improve risk management across the enterprise. In light of competitive disruption – and rising capital and operational costs – the pressure is really on to find greater efficiencies and improve margins.

Similarly, within insurance, the costs associated with the more stringent demands of regulations such as International Financial Reporting Standard 17 and Long-Duration Targeted Improvements mean our customers are increasingly focused on technology costs and speed.

However, managing risk has become ever more complex. Today's firms are contending with sophisticated risks along with a labyrinth of increasingly complex regulatory and compliance requirements, increasing the need for more streamlined and harmonized processes to counter the rising costs of regulation. This can be enabled by integrating technology throughout an organization, helping different risk participants form a single view of risk across the enterprise for improved decision-making and workflow efficiency.

Looking at major shifts, it is impossible not to mention the paradigm shift in IT and the impact on risk management services. Digitalization is driving a fourth Industrial Revolution. Advances in artificial intelligence (AI), machine learning, robotic process automation, blockchain and even quantum computing means that everything that can be digitalized will be digitalized, impacting all areas of business.

Finally, we see tools for data cleansing and reconciliation becoming key. Ultimately, competitive advantage will be enabled by data. Banks sit on a goldmine of structured and unstructured disparate datasets, which will be difficult to monetize without data consolidation across departments and geographies.

How is FIS evolving to remain at the forefront of risk management technology?
Martin Boyd: It is very clear to us that we cannot sit back and watch. We continue to adapt with innovations and investments in areas such as AI, robotics and blockchain, but it is also really important to emphasize our transition from technology provider to service partner.

We are seeing changes in the way C-level executives do business with software and service providers. Decision-makers are no longer interested in point solutions. Instead, they are seeking strategic relationships with IT providers and pivoting from on-premises software to software-as-a-service (SaaS)-based services and delivery. This approach enables them to benefit from lower and more predictable costs as well as greater scalability and flexibility.

In response, FIS has transformed solutions delivery across many areas of its business, developing and expanding SaaS and risk-as-a-service. In striving to be the strategic technology partner heavily investing in next-generation technology, tools and talent, we are building a world-class delivery network for deploying solutions on-demand through the cloud.

Our microservices strategy allows us and our customers to adapt extremely fast to new business and customer requirements and regulatory changes. This technology approach will open a completely new area of efficiency when combined with AI and machine learning.

It is also important to underline that because of our global scale and depth of experience, we can help organizations of all sizes seamlessly blend the old and the new in ways that provide breakthrough improvements – increasing efficiency, yet protecting existing investments, meeting our clients' enterprise risk needs and future-proofing their businesses.

More generally, with our clients' industries changing faster than ever and undergoing rapid transformation, we must keep innovating and adapting with purpose to stay ahead. By keeping a firm eye on the future, FIS will continue investing in, developing and bringing to market leading-edge digital solutions that can help our clients be the 'disruptors' of their sectors.

Bloomberg

- **Evaluated Pricing and Data – Fixed Income**
- **Hedge Fund Risk Management**
- **Pricing & Analytics – Fixed Income**
- **Pricing & Analytics – Multi-Asset**

The needs of investment professionals have changed enormously in recent decades. The move to electronic trading, combined with ever-increasing regulatory and compliance requirements, has led to growing demand for independent valuations of assets from multiple sources.

Bloomberg, the winner of the inaugural award for Evaluated Pricing and Data – Fixed Income, is well versed in the need for quality pricing data and considers it one of its key differentiators. "We believe that pricing is the central engine that feeds the risk system," explains Jose Ribas, Global Head of Derivatives, Risk and Treasury. "We have invested a lot in our evaluated pricing products, Bloomberg Valuation Service (BVAL) Cash and BVAL Derivatives. We provide independent valuations; we have pricing libraries to accurately price these and to provide the risk management."

Current front-of-mind topics for Bloomberg's customers include the Fundamental Review of the Trading Book, as well as the transition from Libor, which will impact all aspects of risk. Ribas explains: "All of these regulations are of concern to our clients and our job is to make sure we can service them with a seamless workflow. They need to have a system that works dynamically for them and for the regulations. Today, it is not just about end-of-day pricing – for instance, there are pre- and post-trade calculations that have to be considered. Risk is becoming an increasingly intraday exercise."

To satisfy this transition to intraday reporting, Bloomberg has responded by providing more data more frequently. Its BVAL solution supplies independent and transparent pricing for more than 2.5 million securities across all asset classes, with its fixed income coverage spanning government, supranational, agency and corporate bonds, municipal bonds, and securitized products in more than 35 countries. For assets that are actively traded, BVAL provides valuations several times a day, while, for less liquid securities, the pricing source derives a comparable relative price value. Notably, all valuations are supported by the BVAL Score – the company's proprietary measure, which shows the relative amount and consistency of market data used to generate each evaluated price.

Aside from the high-quality pricing data it provides, Bloomberg is also noted for the strength of its analytics, which sees it collect two awards for Pricing & Analytics – Fixed Income, and Pricing & Analytics – Multi-Asset.

Bloomberg's data enables fixed income clients to perform their own valuations where needed, Ribas explains, "customers want the prices for bonds, swaps, and so on, but they also want an independent yield curve, swap curve or volatility to independently price instruments. This is an important data component, with the raw data going into the pricing, so we have golden copies and data sources to make sure we can replicate numbers from the past."

In the multi-asset space, Bloomberg's strength lies in being able to provide truly cross-asset coverage, with all assets from vanilla to exotics provided for. This is essential for customers wanting to use one system to manage their investment strategy and move from one asset class to another as market conditions demand.

Jose Ribas, Bloomberg

In addition to the quality of its data and analytics, Bloomberg believes one of the strongest aspects of its strategy is its ability to service clients across the technology stack. "Clients are looking to streamline. They want to spend more time making decisions and less time gathering data," states Ribas. "We provide multiple modules that go from pricing, to risk management and then to regulatory reporting. Clients do not have the bandwidth to have multiple systems and to go across these reconciling numbers – our approach provides a consistent workflow across the whole value chain." Furthermore, its risk management links directly into the front-office workflow, meaning users can go from risk management to trading in one system.

Ribas also highlights Bloomberg's ability to enable customers to customize their own reporting thanks to application programming interfaces (APIs) that have been added to the user interface workflow. "Besides regulatory compliance, one of the most important things is to help clients with their own best practices. They may have to report numbers in one format for the regulator, but then they have their own internal investment criteria and tolerances, and so their own individual requirements on how to cut the data." A further advantage of the use of APIs is that it provides customers with greater transparency, as they are able to query the system directly and have a complete understanding of how numbers are produced, rather than data being presented using a black-box approach.

Bloomberg is also the winner of a fourth award – for Hedge Fund Risk Management – a prize it takes home for the second consecutive year. "One of the main challenges for hedge funds is the fight for yield," says Ribas. "Rates are low, so hedge funds are going more into exotics, such as structured notes and mortgage-backed products, rather than the traditional vanilla instruments." Bloomberg's strong cross-asset coverage is therefore considered a particular advantage, especially when set against the growing need to be aware of margin on derivatives pre-trade.

That Bloomberg's systems run in the cloud is considered critical in satisfying the evolving needs of customers, as it means it is able to move in response to market trends. "This is a dynamic world," states Ribas. "Upgrades of traditional systems take many months, but we run in the cloud so, if clients have investment ideas they want to execute, we can respond in days, if not overnight. Our clients like working with us – we work at the same pace."

Looking forward, a key area in which Bloomberg foresees more activity is automation. While automation has been key in streamlining middle- and back-office operations for regulatory reporting, Bloomberg believes there are more parts of the market – for instance the pre-trade space – that could do with more automation. "There is a lot of data to monitor on a regular basis, and making more use of automation and alerts is key in running a more profitable business," concludes Ribas.

FICO

- **Innovation**
- **Artificial Intelligence**
- **Cyber Risk Quantification**

Marking another successful year for the global analytics software provider, FICO climbed one place in the *RiskTech100*® rankings to sixth and held on to all three of its category awards: Innovation, Artificial Intelligence (AI) and Cyber Risk Quantification.

Innovation

With cyber attacks and fraud continuing to make headlines, it is unsurprising that a vendor driving change in this globally important area has won the *RiskTech100*® Innovation award for a third consecutive year. FICO's win reflects its continued focus on issuing new technology and empowering users to tackle the challenges they face in the cyber age.

The analytics software firm has been in the risk management space for the entirety of its 60-year history. The vendor's extensive experience has enabled it to take foundational approaches to managing credit risk and apply them to other areas.

FICO is now recognized for challenging the status quo in areas such as cyber risk, anti-money laundering (AML), financial fraud and collections, as well as fundamental data science capabilities, with its groundbreaking use of AI, big data and algorithms.

The US-based firm shows no sign of resting on its laurels, and 2019 saw the company claim a data science milestone, with Scott Zoldi, Chief Analytics Officer, filing FICO's 100th software patent application for machine learning and AI software technologies and techniques.

The launch of Falcon X delivers innovative AI and machine learning technology aimed at preventing new forms of fraud and financial crime that are being enabled by the rapid adoption of real-time payments. Running on Amazon Web Services (AWS), Falcon X streamlines fraud detection and AML processes.

As part of its solution, FICO is also introducing its Financial Crimes Studio with InstantML, which shortens the time to develop and deploy real-time financial crime models through purpose-built and domain-specific FICO machine learning algorithms. It also allows data scientists to build models based on their banks' unique customer portfolio using open-source machine learning libraries, while explainable AI tools aid model governance by providing visibility into model behaviors.

Artificial Intelligence

It is this continual innovation in the use of AI that has led to FICO retaining the crown as winner of the AI category award for 2020.

While AI is relatively new for some vendors, FICO first built AI into products nearly 30 years ago, making it an early AI adopter and innovator in risk management and analytics applications. Doug Clare, Vice-President for Product Marketing and Portfolio Strategy, explains that AI is used across FICO's portfolio of analytics products. Use cases range from fraud detection to risk management to logistics optimization and, as a result, FICO has "a very rich portfolio of analytics techniques".

FICO has continued to drive forward in AI following the release of the FICO Analytics Workbench xAI (explainable AI) Toolkit, which came in the wake of new data privacy regulation and growing concern about transparency in decision-making. FICO's xAI helps firms explain and understand how AI and algorithms are formulating decisions, and which data elements considered by a complex model have the most significant impact on outcomes.

Doug Clare, FICO

Released in September 2018, the toolkit combines FICO's existing data science tools with open-source technologies. With the improved transparency and insight into algorithms offered by the toolkit, credit risk officers, fraud analysts and data scientists alike can explain the machine learning models behind complex AI-derived decisions, which can be valuable support for compliance and strategic reviews.

FICO continues to build AI into its products, and 2019 was no different. "We're keen to bring more powerful analytics into our solutions," says Clare on FICO's future plans in AI, "with more complex AI being pushed into product and domain areas that may have been more rules-driven in the past."

Cyber Risk Quantification

Cyber risk continues to climb the corporate agenda as firms are increasingly seeing the consequences of security breaches in the media, with high-profile cyber attacks causing share prices to plummet. It is no surprise that cyber security experts and technology solutions are in hot demand, and FICO is setting the standard high.

To tackle cyber crime, FICO's free and innovative cyber risk scoring, FICO Enterprise Security Score (ESS), uses advanced analytics to forecast the risk of a material breach event. This means firms can take a proactive approach to cyber security and assess both cyber breach risk and potential impact on portfolios. Clare says: "We think it's really valuable, and we are offering it free, forever, for everyone. Creating a lingua franca for security risk is something we are really proud of."

To launch FICO ESS in 2017, the company acquired QuadMetrics – a firm with predictive analytics for rating the security of an organization – and coupled its technology with FICO's own AI internet protocol. Clare claims the result was "the first fully empirical, supervised approach to quantifying cyber risk."

FICO has seen particularly good traction in insurance, but as regulators set the bar higher with new requirements for data processing online to protect consumers, the market has rapidly expanded beyond financial services. Europe's General Data Protection Regulation has fueled change since it came into effect in May 2018, and Clare highlights that these types of regulatory reforms continue to cause an upswing in demand for cyber risk quantification tools.

With increased demand for cyber risk quantification, FICO is looking to become the de facto standard following new partnerships and wider market adoption. In October 2018, the US Chamber of Commerce and FICO released the Assessment of Business Cybersecurity – the first of its kind – which is powered by the FICO Cyber Risk Score and measures the cyber security risk of the entire business community and across key sectors.

FICO is focused on continuing to drive adoption for FICO ESS, not only for insurance but also third-party risk management. In November 2019, the company announced the release of its machine learning Cyber Risk Score on the AWS Marketplace, making adoption easier, and with a new dashboard for third-party risk management to help organizations understand their exposure and adopt best practice vendor risk management and monitoring frameworks.

AxiomSL

• Risk Data Aggregation & Reporting

Winner of the *RiskTech100®* Risk Data Aggregation & Reporting award AxiomSL cites several factors in its approach to data aggregation and reporting that make it stand out against the competition. Key among these are native data sourcing, proprietary data dictionaries, and data lineage and transparency.

Chief Client Officer Harry Chopra explains: "If you look at a financial institution, for example, its credit portfolio has retail exposure, wholesale exposure, exposure to investments and exposure to sovereigns. Data from those four areas is aggregated from disparate sources and, if you have preconceived notions about how to treat that data when it is brought onto a data management platform, then you create more problems than you solve." Accordingly, the number one tenet of AxiomSL's approach is native data ingestion – meaning it can pull data from any system and incorporate it onto the ControllerView platform.

Second, AxiomSL has created a series of bespoke data dictionaries with specialized focuses, including capital and liquidity. When data comes onto the platform, it is mapped to the relevant dictionary, which then creates a mechanism compliant with the Basel Committee on Banking Supervision's standard number 239 to ensure the data is accurate and usable for all necessary calculations and data enrichment.

The third key aspect of AxiomSL's approach to risk management is complete data lineage and transparency, which is increasingly important

Harry Chopra, AxiomSL

to banks – particularly in light of impending Basel IV mandates. "Every financial institution wants to know how transparent its risk-weighted assets calculation process is. We tell banks exactly what we are doing as part of the asset calculation process – an approach that is the antithesis of a black box," says Chopra.

This approach to data transparency is also demonstrated by AxiomSL's solution, LineageView, which was launched in late 2018. The solution enables clients to track credit exposures on its balance sheet from target to source and vice versa. Chopra elaborates on the idea: "Clients may have a car loan from system X, a different loan from system Y, and so on. All of these exposures are added up, run through the risk calculation process and included on the institution's balance sheet. However, regulators want to know exactly where the final number comes from. They want complete lineage."

Next on the horizon for AxiomSL is to offer intraday liquidity reporting, which banks are increasingly demanding. In addition, the company is enhancing its platform with a planned 2020 launch of Spark technology, which provides in-memory execution and performance gains to speed up the calculation process.

Wolters Kluwer FRR

- **Regulatory Reporting**
- **Liquidity Risk**

2019 marked a record award-winning year for Wolters Kluwer's Finance, Risk & Reporting (FRR) business, reflected in the company's overall strong performance in the Chartis *RiskTech100*® rankings – where it jumped from 14th to eighth place – and secured awards for Regulatory Reporting and Liquidity Risk.

Wolters Kluwer FRR's OneSumX for Regulatory Reporting enables financial institutions to address global, complex regulatory data requirements stipulated by regulatory bodies and central banks, as well as the requirements for internal management reporting. It provides financial institutions with unparalleled capabilities to analyze, interpret and address ever-changing global regulatory reporting and compliance obligations.

OneSumX for Regulatory Reporting combines bank data into a single source of data to ensure consistency, reconciliation and accuracy, and includes Wolters Kluwer's Regulatory Update Service. This unique service is maintained by Wolters Kluwer experts who actively monitor regulation in 30 countries.

The OneSumX Liquidity Risk Management solution, meanwhile, combines a risk management/stress engine and regulatory reporting platform that enables firms to monitor, manage and report liquidity risk.

"Our clients have a growing need for a centralized view of regulatory data and an increasing demand for sophisticated, cross-domain reporting capabilities in financial risk,"

Claudio Salinardi, Wolters Kluwer FRR

says Claudio Salinardi, Executive Vice-President and General Manager of Wolters Kluwer's FRR business. "As a result, Wolters Kluwer FRR has implemented strategic initiatives and technology innovations to address these trends and client pain points. Key initiatives include developing an integrated and modular finance, risk and reporting solution underpinned by a new, technologically advanced platform, common data model, regulatory risk calculators, business analytics, and enhanced workflow tools and user interfaces."

"We have also increased enterprise-wide risk and regulatory integration and stress-testing, with a focus on the financial risk space and established alternative cloud delivery models," Salinardi adds. "We are leveraging partnerships to provide quicker implementation and to broaden go-to-market opportunities."

As part of its ongoing commitment to strengthen client services, Wolters Kluwer FRR recently launched its software-as-a-service regulatory reporting solution – the first time the company's OneSumX regulatory software has been made available on the cloud.

The launch aligns with the cloud technology strategies adopted by the company's customers, providing predictable and lower total costs of ownership. Wolters Kluwer FRR has also unveiled a major upgrade to its OneSumX Regulatory Engine, which is characterized by its enhanced performance and better user experience in speed, automation and scalability.

SAS

- **Risk & Finance Integration**
- **IFRS 9**
- **Model Risk Management**

Martim Rocha, SAS

Traditionally driven by regulation, financial institutions' approaches to risk management are becoming increasingly business-focused. Regulation may still drive the initial requirements for risk solutions, but institutions are now seeking to unlock the benefits of data gathered and to share that data and associated processes across the business to improve performance and efficiency. This evolution of the market underpins the strategy and approach to risk management of top five-ranked competitor SAS.

Risk & Finance Integration

SAS has been an active analytics solution provider for more than 40 years. Its vision is to transform a world of data into a world of intelligence and its long-standing mission is to empower and inspire with the most trusted analytics. To maintain its position as a market leader, SAS invests heavily in research and development – 25% of revenues are regularly reinvested, with core areas for development including its open Viya architecture, machine learning and results-as-a-service. As the winner of the *RiskTech100®* Risk & Finance Integration award, the company has made significant investment in creating a centralized, scalable and flexible approach to risk management. This strategy enables financial institutions to take a streamlined and process-oriented – rather than solution-led – approach to risk.

"While there is still demand for point solutions, institutions want to treat data, processes, scenarios and models as objects that they combine in an order that meets the needs of the situation," explains Martim Rocha, Director, Industry Consulting at SAS. "They want to break up risk management into core processes, such as credit loss forecasting, and then execute to meet needs."

A key aspect of SAS' approach to risk management is the separation of its technical platform and business content. Its risk and finance platform provides the underlying technology such as data management, process workflow and sophisticated analytics, while the content refers to the intellectual property and methodologies for specific areas of risk and finance, for example International Financial Reporting Standard (IFRS) 9 or IFRS 17. This content can be provided by SAS, by partners or developed by the customer directly. "The purpose of separating the platform from the modular content is to provide customers with the flexibility needed to face ever-changing business and regulatory requirements without having to change the underlying architecture," details Rocha.

IFRS 9

The subject of IFRS 9 is particularly topical, with its adoption into risk and finance processes a key priority for financial institutions in recent years. SAS is the winner of the *RiskTech100* ® award for its approach to the new accounting standard. "We track audit and regulatory requirements closely, and our approach is to combine key analytic elements of the regulations with out-of-the-box capabilities to develop reports and workflows for IFRS 9 impairment calculations," says Rocha. SAS also seeks to ensure its solutions can support future requirements, its SAS Solution for IFRS 9 and SAS Solution for Current Expected Credit Losses (CECL) share several components with the SAS Solution for stress-testing so it can easily be extended for stress-testing or capital planning, for example.

Looking forward, a key area of focus for SAS in risk and finance is asset and liability management (ALM). A demanding market environment, interest rate uncertainty and pressure on margins are pushing financial institutions to re-evaluate their ALM infrastructure. This also provides an opportunity to consolidate the multiple ALM solutions and pricing engines typically in place in financial institutions. Given this context, SAS is investing heavily in updating its ALM solution to reflect the wider industry move towards scenario-based risk management, together with risk and finance integration.

"A key part of SAS' new ALM development is to help banks optimize their balance sheets. With SAS' position as a Category Leader in the Chartis RiskTech Quadrant ® for Credit Risk Solutions (2019), improving ALM is a natural step towards providing a holistic view of the balance sheet," Rocha explains. "We seldom come across an opportunity where the customer just wants to perform reporting and standard analysis. Customers are seeking to enhance margins by optimizing their balance sheets. Traditionally, this was done from a hedging point of view, but with more data, computing power and enabling technologies, customers are seeking to optimize across use cases." SAS, for instance, can support analysis of different balance sheet evolution scenarios against various market and behavioral risk factors. This allows customers to anticipate challenging situations and adapt their balance sheet to enhance its resiliency to potential future shocks or to maximize income.

Model Risk Management

SAS is also the winner of the Model Risk Management (MRM) award, reflecting its expertise in helping financial institutions ensure governance of their models and enhance the value of the data generated. The role of MRM is increasingly important, as Rocha explains: "Models are proliferating and growing in complexity, while regulators demand more detailed information. Consequently, the need for a robust review and validation framework to effectively manage model risk becomes mission-critical." Without an MRM framework, businesses are unable to enforce best practice across the enterprise. A fragmented approach often means little integration, with siloed model development ecosystems – which results in a limited enterprise view of model risk.

SAS MRM enables clients to centrally manage the risk involved in building, deploying and using models, while improving efficiency across the model lifecycle. Rocha says: "Our customers benefit from risk management across all elements of the model lifecycle, such as model development, implementation, use, validation, monitoring and retirement, while increasing the business value of models." The solution is linked to SAS' Model Implementation Platform, enabling developers to create, test and validate models, before obtaining a 'key' from MRM to release them into production and track them.

Recent areas of focus for SAS in MRM have included helping customers safely use machine learning and the automation of simple tasks clients need to perform repeatedly, such as performance monitoring and model usage capture. Looking forward, SAS expects demand for model governance to rise as the adoption of AI and machine learning models increases. Trust will be key for the adoption of these new models, which will need to be underpinned by a rigorous, enterprise-level approach to model governance.

MSCI

- **Strategy**
- **Buy-Side**
- **Market Risk – Buy-Side**
- **Risk as a Service (RaaS)**

For the sixth consecutive year, MSCI triumphs in the *RiskTech100* ® Buy-Side category. The US company demonstrates consistent excellence in serving the asset management community, with its approach also earning the award for Strategy.

MSCI points to a number of reasons why it stands out from the competition, research capabilities being a case in point. "The size and depth of our research team is a key differentiator. Most of our competitors don't come from a research background and those that do are much smaller. We have a much larger research team and are able to cover a broader set of topics at a greater depth," explains Dan Sinnreich, Managing Director at MSCI. Allied to this strong research background is the quality of MSCI's data. "Because MSCI is also an index provider, where the data must be absolutely pristine, we have very thorough data quality processes. We aim to ensure that our analytics are built on the highest-quality data possible," says Sinnreich.

MSCI today serves institutional clients worldwide, with some of the largest asset managers, pension funds and sovereign wealth funds using its data and analytics to define their strategies. Notably, it enjoys a particularly strong relationship with the senior management of many buy-side firms. "Chief risk officers call us to discuss ideas and questions from the board of directors," says Thomas Moser, Executive Director, MSCI Analytics Products. "This helps us understand the needs of our clients in detail and we can leverage these relationships to develop and improve products. It is a continuous learning process."

A key challenge for the buy side is that margins are shrinking. Consequently, the pace of consolidation has picked up and asset managers are looking to minimize costs where possible. This trend has fed into the success of MSCI's Managed Solutions offering, for which it won the Risk as a Service (RaaS) award for the second year in a row. Uptake is strong, with many existing product clients also becoming services clients. Sinnreich says: "Many asset management firms have thinner IT teams than they once had, they have already cut costs, so they are looking for additional support." This is especially important given that the investment landscape has become more complex over the past decade, as Sinnreich details: "Asset managers are seeing demand to provide more customized solutions, there are more asset classes to manage, and a greater demand for transparency in client communications. We also see an increasing dialogue around stress-testing and liquidity risk, as managers increasingly expand the types of risk they monitor and manage."

From a product perspective, one of the most notable developments is the launch of MSCI Beon, a new analytics platform that delivers MSCI's content, risk analytics and portfolio management tools in a single place.

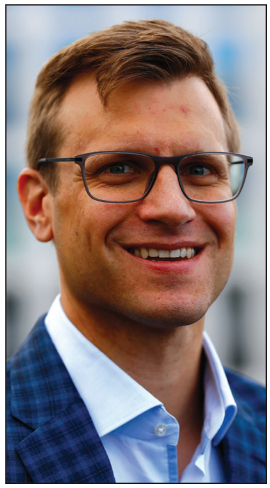
MSCI has also made continual enhancements to its existing product set. On the equity side, it has added over 70 new factors to its FactorLab product, which is used by equity portfolio management clients to identify strategies to include in their own investment processes and portfolios. Notably, FactorLab is helping clients handle the rise of alternative data and how best to manage it. "Data inundation is one of the main challenges our clients face. So we are bringing these datasets in, cleaning them, analyzing them and – if the signals have explanatory power – we include them in FactorLab," says Sinnreich.

MSCI also triumphed in the first Market Risk – Buy-Side award. It has been active in this market for a number of years, enabling clients to undertake risk reporting and to manage risk effectively. One of MSCI's strong points is that it can deliver market risk on a large scale, across many portfolios and factoring in a variety of market shocks. To effectively achieve this, having large-scale batch processing capabilities married to high-quality data and flexible models is essential.

MSCI is also investing heavily in its securitized products and fixed income offering, which is a key strategic area for the analytics division. In 2019, MSCI added significant functionality upgrades, including a new prepayment model for fixed-rate agency securities, coverage of universal mortgage-backed securities products and a new credit risk transfer model. In January 2020, responding to investors' demand to more closely align exposures with investment objectives, MSCI launched a series of factor and environmental, social and governance fixed income indexes.

Within market risk, MSCI highlights its stress-testing capabilities. Here, it provides clients with ready-to-use scenarios across a range of potential market events, such as Brexit or trade wars, leveraging its comprehensive stress-test engine with strong diagnostic capabilities. Moser explains: "It is not just about believing the results generated – clients want to understand how realistic the results are. So our research team has worked for years designing new models to validate how good a stress-test set-up is at reflecting a market event."

Dan Sinnreich, MSCI



Thomas Moser, MSCI

Looking ahead, MSCI will continue its investment in priority areas of middle- and front-office risk, and performance attribution. A key trend it identifies is the demand for multi-asset class solutions, for which MSCI has developed the Multi-Asset Class (MAC) Factor Model. The MAC Factor Model allows asset managers to understand their exposure across all public and private asset classes, and to build and analyze multi-asset portfolios and strategies. In 2020, MSCI is looking to add performance attribution capabilities to its MAC Factor Model, addressing the growing need for managers to understand the factor drivers of performance in MAC portfolios.

MSCI also notes that asset managers are increasingly using analytics to support sales enablement. End-investors are asking asset managers for more details on exposure and more insight into strategy. In turn, asset managers are asking for MSCI's support to make this happen. "Two large managers that we signed in 2019 are using our tools to support their sales efforts to end-clients and prospects," says Sinnreich, "and we'll certainly be doing more to enable our clients to market and sell their strategies using the industry standard risk and return attribution views we provide."

LexisNexis Risk Solutions

- **Financial Crime – Data**

Financial crime continues to sit high on the compliance agenda. High-profile money laundering cases, along with regulatory developments such as the Fifth Anti-Money Laundering Directive in the European Union, mean the spotlight is firmly on financial crime and anti-money laundering. Technology plays an intrinsic role in the fight against financial crime, but just as important is the data that feeds these systems. The winner of the *RiskTech100* ® award for Financial Crime – Data, LexisNexis Risk Solutions, once again demonstrated its excellence in this area, triumphing in the category for the second consecutive year.

"LexisNexis Risk Solutions provides data and technology solutions for a wide range of industries, including insurance, financial services, healthcare and government," explains Leslie Bailey, Senior Director of Market Planning, Financial Crime Compliance. Bailey adds: "With 40 years of experience behind us, we have a global commitment to help prevent financial crimes, including money laundering, bribery and corruption and terrorist financing."

Through its Bridger Insight XG platform, LexisNexis enables organizations to efficiently manage financial crime compliance processes. Together with LexisNexis' WorldCompliance Data, the platform provides one of the most comprehensive and up-to-date databases available of politically exposed persons, as well as global sanctions and enforcement lists and adverse media checks. "The complexity and ever-changing dynamics of the global marketplace lets in new and different types of risks that financial institutions and other companies have to manage on an ongoing basis," says Bailey. "The risks that businesses face literally evolve day by day and are greater than ever. Our ability to offer an expansive breadth and depth of global risk intelligence brings simplicity to complexity."

Leslie Bailey,
LexisNexis Risk Solutions

Notably, while LexisNexis Risk Solutions is investing heavily in innovative technologies such as machine learning and advanced analytics, it also cites its global research team as a key differentiator. Automation is a key part of identifying whether a person or company is referenced in a government bulletin or article on financial crime, but a researcher is better placed to identify the context of that reference, for instance as a party of concern or simply as a witness.

A further area of innovation is the use of digital identity information such as location, behaviour and threat intelligence to better identify risks. This approach is key in an age where far more interactions occur with customers in digital realm than face-to-face. The company has added to its solution stable in this space, with the acquisitions of digital identity specialist ThreatMetrix in 2018 and consumer behavioral data provider ID Analytics in early 2020.

Fenergo

- **Client Lifecycle Management & KYC**

With a rise in financial crime, regulators are putting increasing pressure on financial institutions to apply more rigorous customer due diligence measures when onboarding entities. Banks are required to collect more data and documentation from clients, increasing the cost of compliance and seriously impacting operational efficiencies and client experiences.

Amid ever-evolving risk and reporting requirements and a clampdown on a lack of compliance with Know Your Customer (KYC) obligations, there is a growing need for financial institutions to automate compliance procedures, allowing employees to focus on revenue-generating tasks.

Fenergo's leading client lifecycle management (CLM) and KYC solutions enable financial institutions to solve the challenges of this 'perfect storm'. Niall Twomey, Chief Technology Officer at Fenergo, says: "Fenergo differs from other business process management providers with our unique community-based approach to product development, depth of our regulatory and financial services expertise, and our deep product functionality and content. As a leading CLM vendor that specializes in financial services, we are highly tuned in to the exact requirements of financial institutions."

Working closely with its client base, Fenergo has built a community of more than 20,000 risk and compliance experts who convene regularly to discuss the regulatory and technological challenges facing their organizations. This directly feeds into Fenergo's regulatory and product road maps.

Niall Twomey, Fenergo

Fenergo's solution has a unique breadth of global regulatory coverage, spanning the local due diligence rules of over 80 countries worldwide, and incorporating global and local anti-money laundering, KYC and tax compliance regulations, along with global over-the-counter derivatives reforms.

The company's application programming interface-based CLM solution is integrated with best-in-class entity data and customer relationship management providers to enable front- to back-office connectivity, allowing financial institutions to onboard customers from any channel digitally, quickly and seamlessly, while accelerating time to revenue.

Following substantial investment in research and development, Fenergo has announced several new solutions and product enhancements in the past year, including Digital KYC, FenHost Cloud Managed Services, Rules as a Service and Digital Configuration Studio – a low- to no-code administration suite that allows financial institutions to easily configure CLM solutions to suit their organizational needs.

The company is driving organic growth by expanding into new market segments – including asset management – and increasing its global footprint with new offices. Fenergo has also embarked on strategic partnership agreements with best-in-class technology providers and consultancy houses.

Twomey highlights that further strategic partnership announcements can be expected this year: "2020 will also see further developments for our platform, particularly in cloud, robotics and artificial intelligence, case management, data management and analytics."

Moody's Analytics

- **Balance Sheet Risk Management**
- **Banking**
- **Credit Risk for the Banking Book**
- **Current Expected Credit Losses (CECL)**
- **Enterprise Stress Testing**
- **Model Validation**
- **Pricing & Analytics – Credit**

As winner of seven category awards and placing fourth overall in the *RiskTech100* ® 2020 rankings, Moody's Analytics continues to assert itself at the forefront of risk management with its technology solutions.

"We are gratified that Chartis continues to recognize Moody's Analytics as a leading risk technology provider," said Steve Tulenko, President of Moody's Analytics. "With our solutions, clients are simplifying, digitizing and automating their processes, operating more efficiently, and making better and faster business decisions."

New Category Win: Banking

Presenting the Banking award to Moody's Analytics recognizes the extensive global adoption of its solutions, which help banks with – among others – lending, regulatory and accounting standards, and balance sheet management.

The past year has seen a number of noteworthy developments for Moody's Analytics in this sector, starting with the addition of major new automation and commercial real estate (CRE) functionality to its CreditLens credit lifecycle management solution. Integration into the CreditLens platform of the Moody's Analytics QUIQspread tool allows clients to automate one of the most laborious aspects of credit decisioning – the collation, extraction and input of financial data. The solution's new CRE capability provides access to powerful CRE functionality directly within the CreditLens platform while delivering deeper insights to inform CRE credit administration.

The company also recently launched Reporting Studio, its first reporting-as-a-service solution, which allows clients to address regulatory reporting requirements without the need for on-premises software deployment and maintenance. Deploying this solution in the cloud means a lower total cost of ownership and increased scalability – and reduced demand on clients' reporting teams.

Moody's Analytics will remain focused on solving the challenges its banking clients face. New and existing accounting regulations – along with increasing imperatives for operating efficiency – mean flexibility is prized. The convergence of risk and finance functions, especially in terms of liquidity and credit integration, also poses its own unique challenges that the company is rising to meet.

Comprehensive CECL Capabilities

The global provider is winner of the Current Expected Credit Losses (CECL) category for a second year, reflecting the comprehensiveness of its cloud-based ImpairmentStudio platform and its broad CECL-automation capabilities. It combines the company's rich credit risk data with its best-in-class analytics and deep experience in impairment accounting to help firms identify the risks and opportunities presented by CECL.

The ImpairmentStudio platform is designed to automate and streamline complex internal CECL processes required to meet the new accounting standards. It helps clients improve their efficiency while producing usable business insights. The company feels it is important for institutions to look beyond initial deadlines and compliance requirements to how CECL efforts can help strengthen their overall risk infrastructure and risk management frameworks.

Continuous enhancements to the solution over the past year have provided customers with greater flexibility, as the company has been certain to maintain the latest functionality for the continually changing accounting guidance. This is best exemplified by enhancements to pre-configured reporting capabilities, including roll-forward and attribution analysis, and integration into the solution of additional Moody's Analytics data and models. The platform covers all asset classes in scope for CECL, including loans, debt securities, off-balance exposures, trade receivables and reinsurance receivables.

The flexibility offered by Moody's Analytics' CECL offering is a vital strength. While the accounting guidance is not expected to change materially over the coming years, the company forsees that the industry itself will drive a significant amount of change as institutions begin to conform to industry norms. In anticipation of this, the company has ensured that its CECL solution is able to immediately adapt to industry changes, giving customers confidence that its platform will continue to evolve along with their requirements.

Model Validation Award Retained in 2020

In an increasingly challenging financial environment, there is an ever-greater need to validate and monitor credit risk models. Moody's Analytics retains the Model Validation award, triumphing for a second year for the breadth and robustness of its market-leading model validation solutions. Encompassing the lifecycle of risk and finance modeling, the company demonstrates deep expertise in developing risk models and software across market risk, credit risk, stress-testing, liquidity risk and asset and liability management (ALM) functions.

Moody's Analytics' model validation solutions cover retail as well as commercial asset classes, for both internally developed and third-party models. Among these offerings is the cloud-based CAP solution. Powered by industry-leading proprietary data, a wealth of risk modeling experience and proven modeling frameworks, the CAP solution lets firms build, validate and monitor tailored models quickly and at scale.

The solution's flexible approach means that model deployment and integration tools within the software publish models as application programming interfaces (APIs) that can integrate with internal systems and other solutions from Moody's Analytics. It can also enable an interactive and collaborative environment throughout the modeling lifecycle, addressing the challenges of change control and documentation.

Clients are also able to build more robust models by augmenting internal data with proprietary Moody's Analytics data specifically tailored towards their portfolios, or specific segments of their portfolio. Both capabilities use the vendor's frameworks for model development, validation and monitoring of probability of default models.

Continued Leadership in Credit Risk for the Banking Book

2020 marks the fourth straight year that Moody's Analytics has won the *RiskTech100®* Credit Risk for the Banking Book category. Clients worldwide turn to Moody's Analytics for solutions to their complex credit questions. The company's combination of data, analytics and expertise allows it to deliver those solutions, and differentiates Moody's Analytics from its competitors.

Moody's Analytics' wholesale and consumer credit offerings, together with its credit assessment and origination solutions, enable firms to assess and manage their credit risk exposure over the entire credit lifecycle. As exponentially more information becomes accessible, customers are looking for efficient ways to manage the influx, and many are now also seeking to incorporate signals from alternative data into their credit decisioning and analytics.

The company has responded by designing solutions to help customers achieve those goals. One example is its new Credit Sentiment Score tool, which uses natural language processing and textual analytics of news media to identify signals of credit impairment in companies. This saves customers substantial time in sorting through news articles by extracting actionable insights from them.

Balance Sheet Risk Management and Enterprise Stress Testing Category Wins

Moody's Analytics has won the Balance Sheet Risk Management category for the second year in a row on the strength of its RiskConfidence balance sheet management platform. Banks worldwide use this integrated platform to manage their enterprise-level ALM and liquidity risk and for a range of regulatory and business needs.

The company has also taken top spot for its enterprise stress-testing solutions. Anchored in its modeling expertise, Moody's Analytics' stress-testing solutions help banks meet their stress-testing challenges while extracting business value from the results. By understanding the potential impacts of different scenarios, its clients are able to meet regulatory requirements while also making more informed business decisions.

Moody's Analytics has focused on enhancing its scenario engine to go behind the standard market data shifts and include, for example, the capacity to stress-test behavioral models and balance sheet forecasts. The company feels its capacity to compute analytics at the transactions level to prevent the loss of any precision helps set its offering apart from those of other vendors.

Having ALM/interest rate risk in the banking book, liquidity, fund transfer pricing, International Financial Reporting Standard 9 provision and hedge accounting all computed from a golden source of transaction guarantees the consistency of results. The Moody's Analytics RiskConfidence platform also enables heavy industrialization of balance sheet processing, from day-to-day or month-to-month, which is another clear differentiator.

Inaugural Winner: Pricing & Analytics – Credit

Moody's Analytics has been recognized for its customized credit pricing and analytics solutions, winning the *RiskTech100®* inaugural award in this category. These solutions address many complex requirements, including dynamic challenges in pricing assumptions, pricing scenario adjustments, intraday rate movements and granular cashflow analysis.

Moody's Analytics also stands out for its integration capabilities with third-party pricing providers. Its Structured Finance API has been integrated with many specialized pricing, ALM, trading and risk analytics providers. Such partnerships enable market participants to access Moody's Analytics structured fixed income data, credit, cashflow and pricing models.

The computationally intensive nature of evaluating large numbers of structured finance securities, alongside the goal of making its solutions more modular, scalable and high-performing, means Moody's Analytics is in the process of moving its analytics engines to the cloud. Additionally, it has a number of pilot projects leveraging artificial intelligence and machine learning to help improve its content coverage and its customers' turnaround times.

Winners' Circle

Data at the Core of Effective Risk Management

Data is frequently referred to as the new black gold. For risk management to be capable of effectively identifying, assessing and prioritizing risks, sound infrastructure and powerful analytics are imperative, and accurate, reliable and timely data sits at its very core.

Modern technology is changing the data landscape dramatically. There is a proliferation of data, much of which comes from new, untested sources and remains unstructured. It is often held in disconnected systems and incompatible formats, making it difficult to use. Still, a growing number of companies are looking for efficient ways to manage this ever-increasing influx of information to meaningfully inform key business decisions.

Data – The Beating Heart of Moody's Analytics

Serving the global financial marketplace with world-class tools and risk management expertise, Moody's Analytics offers an unparalleled range of solutions. As a provider of financial intelligence and analytics, data underpins everything – and is the beating heart of the company.

Moody's Analytics certainly stands out for the breadth and depth of its comprehensive and varied proprietary data. It has one of the most extensive data offerings in the industry, spanning asset classes from commercial and industrial to real estate, project finance, and structured finance, and including financial, credit, entity and economic data.

Acquisitions such as Bureau van Dijk, a leading publisher of entity data and corporate ownership structures, and Reis, a leading provider of US commercial real estate (CRE) data, have recently bolstered the company's data offerings. Orbis, from Bureau van Dijk, aggregates, standardizes and distributes one of the world's most extensive private company datasets, with coverage exceeding 360 million companies. It has partnerships with more than 160 independent information providers and uses hundreds of its own sources.

Moody's Analytics data offerings include the following: its comprehensive economic data and forecasts, covering more than 180 countries and their subregions and containing upwards of 280 million economic, financial and demographic time series from over 600 sources; Data Alliance, a collaborative effort between leading financial institutions and Moody's Analytics to create the world's largest collection of private credit risk data; and Structured Finance Data, which includes historical loan-, pool-, bond- and property-level data collected across asset classes.

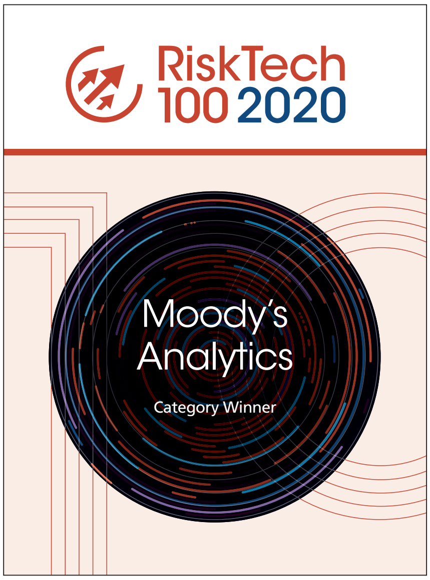
Collective Strengths, Generating New Insights

While Moody's Analytics uses and sells an immense amount of data, it is keen to position itself as much more than a pure 'data provider'. Its goal is to help customers make use of all of the data that is available to them – whether from Moody's Analytics, internal sources, or third parties.

Although the company's individual datasets are powerful in their own right, Moody's Analytics is very aware that the strength of data lies in the whole, not in the parts. By connecting its data offerings, Moody's Analytics stands out from the competition, enriching its customers' risk analysis and delivering insights that were previously unattainable.

One clear example of this strategy is the steps the company has taken to become a standard-setter for CRE data and analytics. The 2018 acquisition of Reis by Moody's Corporation – of which Moody's Analytics is a subsidiary – laid the foundation for the launch of the Real Estate Information Services (REIS) Network, an ecosystem of connected applications that give market participants access to CRE solutions.

In 2019, Moody's also acquired a majority stake in Four Twenty Seven, which scores physical risks associated with climate-related factors and other environmental issues.



Moody's Analytics has since brought these disparate datasets together. Users of the REIS Network now benefit from climate risk scores from Four Twenty Seven to help them more fully evaluate over 7 million US CRE locations.

In addition to selling its data to clients, Moody's Analytics employs it in a vast number of different ways, including developing and integrating it into different innovative proprietary solutions.

Making Sense of the New Black Gold

The company has recently focused on enhancing traditional data with alternative data sources that were previously inaccessible or difficult to use, such as unstructured, synthesized or crowdsourced data. By making these sources available and usable, its customers can develop the insights they need to make better, faster business decisions. One example is its Adverse Media Tool, which uses artificial intelligence (AI) to quickly find and categorize data from a sea of news sources for more efficient risk assessment.

In response to the growing number of companies seeking to extract valuable insights for their credit decisioning and analytics from these alternative data sources, including news, company reports and social media, Moody's Analytics launched two further solutions in 2019. The Moody's Analytics Credit Sentiment Score solution identifies entity-level credit events in news articles and assigns a credit sentiment score that reflects the strength of the adverse credit signal. Meanwhile, its new Commercial Location Score solution – part of the REIS Network – pairs traditional and alternative data with robust modeling capabilities to deliver a reliable scoring standard for commercially zoned parcels in the US.

Future Focus

Deriving benefits from alternative data will remain a significant focus for Moody's Analytics in the near future, particularly given the potential for unstructured data to offer more current and near real-time insights.

The company will continue to launch products that use AI and machine learning to help customers use such data more efficiently and to enable faster, data-driven decisions at scale. Moody's Analytics QUIQspread solution, which helps institutions automate the spreading of financial statements using AI, is highlighted as a clear example of the direction of travel. By incorporating more AI and machine learning in the future, Moody's Analytics is combating the risks of critical information being overlooked, as the largely manual processes traditionally required when working with unstructured data served to not only reduce timeliness, but also to limit how much data could be consumed and analyzed.

Moody's Analytics has a deep understanding of data and the expertise to help its customers confidently navigate an ever-evolving risk landscape and constantly changing marketplace. Continued investments in and innovations with more and better data promises benefits for both the company and its clients well into the future.

Murex

- **Integrated Trading & Risk Management**
- **Market Risk – Sell Side**

Taking home both the *RiskTech100®* inaugural Integrated Trading & Risk Management award and the Market Risk – Sell Side crowns, Murex's MX.3 is an easily integrated, open platform, streamlining risk management processes through its extensive product and analytics coverage, its rich trade repository, portfolio models and valuation across front office, risk, finance and market risk.

MX.3's integrated platform approach tackles the growing imperative for front-office and risk management alignment, a trend being further driven by the impending Fundamental Review of the Trading Book (FRTB).

Bruno Castor, Murex's Head of Market Risk and Initial Margin Calculation, says: "Our platform replaces a variety of systems and reduces the complexity of the IT landscape, making it unique in a highly competitive market."

Throughout its history, Murex has consistently focused on the ongoing development of its solutions by investing heavily in research and development. This has most recently been evidenced in the standardized approach and the internal models approach to FRTB (FRTB-IMA).

"Having anticipated early the implications of these regulatory changes, we adapted quickly and designed flexible products, ensuring our clients are ready for the FRTB compliance deadline. Adapting quickly also allowed us to add another key functionality – the ability to refresh intraday numbers, automatically updating market risk measures on the basis of new transactions and allowing risk management to monitor intraday movements of the main risk indicators."

Bruno Castor, Murex

FRTB is just one of several regulatory requirements the sell side is dealing with. Murex is tackling shifts in the increasingly complicated regulatory compliance landscape by bringing value to clients. Castor elaborates: "For example, we built fit-for-purpose, optimized algorithms for risk managers by exposing the richness of the full calculation chain through transparent dependency graphs, speeding calculations and easing reconciliation at the same time. Furthermore, our investment in graphics processing units and cloud-enablement has made FRTB-IMA an affordable reality."

"With regulation driving increased calculation complexity, we also quickly realized that this would lead to further challenges in the validation process. Our objective is to streamline a validated number in due time on a daily basis. For instance, the ability to automatically identify the dependencies to a correction, be it market data or a set of transactions, is natively available in our platform."

Murex is also continuing its cloud journey in collaboration with top cloud providers Amazon Web Services and Microsoft Azure. Clients can take advantage of hybrid and public cloud options, providing them with significant opportunities to focus on developing their business and to closely control costs.

Hanweck

• Real-time Risk

Real-time risk analytics are essential in today's financial markets. Hanweck's real-time, global, cross-asset risk analytics platform enables customers to meet the unique challenges of computational and methodological complexity in this sector.

Hanweck focuses on front- and middle-office market risk – particularly the large-scale portfolio risk faced by large banks, broker-dealers, asset managers, clearing houses and exchanges. With offices in New York, Chicago, Belfast and Singapore, Hanweck has positioned itself to meet the needs of its global client base, providing the breadth of product coverage required for large global portfolios.

Chartis has identified the company as the leading provider of real-time risk analytics-as-a-service. Hanweck's Mike Hollingsworth, Chief Operating Officer, and Tom Watson, Head of Sales, explain why Hanweck stands out. Watson says: "We push the boundary in terms of real-time risk. We deliver on that real-time promise, which is a sharp differentiator. Our customers are managing their capital a lot more closely, and are increasingly coming to us for accurate, real-time portfolio margin and risk analytics – information that simply was not previously obtainable."

Hollingsworth adds: "A fundamental challenge in real-time risk analysis is having good pricing and reference data to feed into risk models. Real-time data is big, noisy and constantly changing. One of our strengths is the ability to digest and process massive amounts of streaming data and quickly turn it into clean analytics. We have tremendous expertise merging real-time data, reference data,

Tom Watson, Hanweck

quantitative finance and computer science into a high-quality, state-of-the-art service."

Hanweck has invested the past year advancing its theoretical pricing methodologies. Hollingsworth elaborates: "Markets are getting less liquid, yet customers need real-time risk analytics more than ever, particularly during periods of stress and illiquidity. The 'true' price of a security is not always apparent in these situations. Pricing can be very difficult, yet very impactful. We have made great strides in machine learning and financial engineering to advance our real-time, theoretical pricing capabilities."

Looking forward, Hanweck plans to grow its geographic and product coverage. Hollingsworth explains: "We are adding new exchanges and margin methodologies to our repertoire. Extending geographically is also a big focus, commencing with the opening of our Singapore office last year. These moves increase our appeal to new and broader customer segments, including non-options traders."

Winners in Brief

Risk Data Aggregation & Reporting

AxiomSL

One of the main challenges that institutions face in their risk management is handling multiple sources of data. US-headquartered AxiomSL enables its clients to overcome those challenges by leveraging its data integrity and control platform, ControllerView. AxiomSL's comprehensive and technologically advanced approach contributed to its winning the *RiskTech100*® Risk Data Aggregation & Reporting award and its arrival in the ranking's top 20.

Founded in 1991, AxiomSL is a global company with offices across the Americas, Asia-Pacific, Europe, the Middle East and Africa. It serves clients in the financial services, energy and corporates sectors. While it scored well across all categories in the ranking, a notable highlight was AxiomSL's strong score for Customer Satisfaction – one of the highest among the top 20 companies.

Financial Crime – Enterprise Fraud

BAE Systems Applied Intelligence

Winner of the first Financial Crime – Enterprise Fraud award is defence and security specialist BAE Systems. Drawing on 40 years of defending governments and nation states, it has created a suite of financial crime and AML solutions for financial institutions. Its NetReveal Regulatory Compliance suite incorporates advanced analytics with machine learning to provide fewer false positives and improve operational efficiency.

Spanning the entire financial crime, risk, fraud and compliance functions, the suite's NetReveal Enterprise Case Management component of the suite provides a single platform to manage investigations. It organizes disparate datasets centrally, and manages and prioritizes alerts. Notably, it also makes use of robotics process automation to pre-process and route alerts, allowing investigators to spend time on high-value analysis.

Evaluated Pricing and Data – Fixed Income

Hedge Fund Risk Management

Pricing & Analytics – Fixed Income

Pricing & Analytics – Multi-Asset

Bloomberg

Bloomberg, the global business and financial information and enterprise solutions provider, takes home four category awards in the 2020 *RiskTech100*®. Drawing on almost 40 years of experience, the New York-headquartered company prides itself on providing high-quality data and analytics that integrate seamlessly across its entire technology stack. From its Trade Order Management Solutions and Asset and Investment Manager, to its Portfolio Management System and Multi-Asset Risk System, Bloomberg seeks to optimize its customers' workflow and increase efficiency.

Bloomberg's excellence in approach has earned it the Hedge Fund Risk Management award for the second consecutive year. It also collects awards for Evaluated Pricing and Data – Fixed Income, Pricing & Analytics – Fixed Income, and Pricing & Analytics – Multi-Asset.

Winners in Brief

Operational Risk

Chase Cooper

The operational risks facing financial institutions are manifold. Managing cyber risk, enabling operational resilience and handling political risk are just some of the challenges facing risk departments in 2020. London-headquartered Chase Cooper helps financial institutions in 85 countries manage these risks through its aCCelerate GRC software. Its excellence in approach sees it collect the inaugural *RiskTech100*® award for Operational Risk, it was also commended for its strong capabilities in quantification. The aCCelerate GRC solution addresses all aspects of operational risk management, from qualitative to quantitative. In addition to the core risk module, it offers a Scenario module for stress-testing and scenario analysis, as well as a capital module that complies with Basel II and advanced measurement approaches for economic and regulatory capital allocation reports.

Energy Trading – Data

Enverus

Winner of Chartis' inaugural award for Energy Trading – Data is US company Enverus. Formerly known as Drillinginfo, Enverus is an energy specialist with three divisions – Drillinginfo, Trading & Risk, and Business Automation – that span the entire energy lifecycle.

Enverus' Trading & Risk division prides itself on having large quantities of energy market data. MarketView, its fully hosted data management solution, offers a wide range of public and proprietary datasets, which are used by the trading and risk functions of a client base that spans North America, Europe and Asia-Pacific. Trading & Risk in particular benefits from the wider activities of the company, leveraging its network of upstream data to provide clients with a wide view of the market.

Client Lifecycle Management & KYC

Fenergo

The *RiskTech100*®'s CLM and KYC compliance solutions winner is Dublin-headquartered Fenergo. The global financial services specialist provides software solutions that digitally transform and streamline end-to-end CLM processes – from regulatory onboarding, data integration, client and counterparty data management, client lifecycle reviews and remediation to client offboarding. Fenergo has earned recognition for its leading solutions and sophisticated technology platform, powered by extensive financial services and regulatory expertise. With its community-based approach to product development, out-of-the-box rules engine and global team of regulatory specialists, it can assist institutions in future-proofing against evolving KYC, AML, tax and over-the-counter (OTC) derivatives-based regulations. Recent product and delivery developments have also helped secure the company's market-leading position.

Winners in Brief

Artificial Intelligence

Cyber Risk Quantification

Innovation

FICO

Innovation is often most successful when new ideas and techniques are used to enhance or build on existing strengths and capabilities. Analytics software company FICO has demonstrated an ability to innovate with AI and other advanced analytics tools to address new markets – such as cyber risk – and to expand the abilities of its clients by offering modern, digitalized solutions.

FICO's adoption of new technologies and approaches – combined with its robust underlying strategy – has helped it win awards in the Innovation, AI and Cyber Risk Quantification categories. The company won all three of these awards last year, and its continued success reflects its continued innovation and ability to turn this into products that can achieve wide adoption.

Capital Optimization

Treasury & FX Risk

Finastra

With Basel IV looming large, capital optimization is an increasingly hot topic as financial institutions consider not only how to implement the new requirements, but also how to maximize the opportunities afforded by the regime. The UK vendor Finastra collects the award for Capital Optimization, with its Fusion Risk offering enabling users to consolidate disparate data to improve regulatory compliance and reporting.

Created in 2017 following the merger of D+H and Misys, Finastra is one of the world's largest fintech companies. It also wins in the Treasury & Foreign Exchange Risk category, thanks to its Fusion Treasury offering, which comprises treasury platform Fusion Opics and FX and money-market trading system Fusion Kondor, both of which integrate with Finastra's new eFX trading service SeamlessFX.

RiskTech 100 2020

Winners in Brief

Overall Winner
Energy Trading – Applications
Front Office Risk Management
Functionality
IFRS 17
Insurance
Market Presence
Sell-Side

FIS
Through a co-ordinated strategy of organic growth and acquisition, FIS has amassed an extensive collection of risk management and compliance assets covering multiple markets with a broad set of functionality. Continued investment in advancing the technology, capabilities and integration of these assets has resulted in strong and adaptable platforms across the financial services value chain.

This combination of leading solutions with next-generation technologies means that FIS continues its reign at the top of the *RiskTech100*® rankings, taking the prestigious title of Overall Winner for the fifth consecutive year. The company also topped the rankings in seven other categories: retaining awards for Functionality, Market Presence, Insurance, IFRS 17 and Energy Trading – Applications; and gaining first-time recognition in the Sell-Side and Front Office Risk Management categories.

Real-Time Risk
Hanweck
In today's financial markets, demand for real-time risk analytics has skyrocketed. The high cost of capital, greater regulation and less liquid markets have made real-time risk management a critical yet challenging requirement. US-headquartered Hanweck – a provider of real-time risk analytics-as-a-service for global derivatives markets – is the inaugural winner of the *RiskTech100*® Real-Time Risk award.

The company expanded from consulting into product development in 2006, applying hardware-accelerated computing to equity derivatives. Hanweck's real-time risk analytics platform is delivered as a service, with a view to reducing the complexity and cost of ownership for end-users. The platform's flexibility in terms of its content and APIs also simplifies integration with users' risk architectures.

Cyber Risk Management
IBM
Cyber risk management is a multi-faceted issue with a wide range, from threat detection and assessment, to the use of AI and related techniques to identify patterns and threats in a growing tide of data. IBM brings a rich suite of capabilities, from Watson AI to complex data analytics and support for Internet of Things security. This breadth makes IBM a leader in the cyber risk space, and helped it retain the Cyber Risk Management award this year.

IBM's flagship cyber risk product, QRadar, offers the opportunity to detect, prioritize and respond to threats across on-premise and cloud-based environments. It includes out-of-the-box analytics, correlation rules and dashboards to help users address their most pressing security use cases without requiring significant customization effort.

Winners in Brief

Evaluated Pricing and Data – Multi-Asset
ICE

Winner of the Evaluated Pricing and Data – Multi-Asset award is exchange-group ICE. A Fortune 500 company, ICE's growth story is a remarkable one. Starting out 20 years ago as a new entrant in the OTC energy trading space, it is now one of the largest exchange, clearing-house and market data providers in the world.

In the evaluated pricing space, ICE provides end-of-day pricing for approximately 2.7 million financial instruments across 145 countries and more than 50 currencies. Serving both the buy- and sell-sides, the assets it covers range from corporate and government bonds to securitized debt issues, alongside US municipal bond and money markets. Its Continuous Evaluated Pricing service is also aimed at the growing need for intraday data in the fixed income space.

Evaluated Pricing and Data – Credit
IHS Markit

As regulators' expectations around pricing data quality and coverage increase, the need for pricing committees to be confident in their selection of pricing vendors is more important than ever. The UK's IHS Markit has been active in the credit default swap (CDS) and loan pricing space since 2003, developing expertise that has helped it take home Chartis' award for Evaluated Pricing and Data – Credit.

The company offers daily pricing data for more than 6,000 leveraged loan facilities worldwide, as well as 12,000 tranches of European and US collateralized loan obligations. It also has extensive coverage of the CDS space, tracking 3,800 CDS entities and all major credit indexes. Across all of these, IHS Markit details key inputs and pricing assumptions, aiming to provide its customers with complete transparency.

Commodity Trading (CTRM)
ION Group

Winner of the Commodity Trading Risk Management (CTRM) award – and jumping 13 places up the overall *RiskTech100®* ranking to 13th place – is software giant, ION Group. Through a series of acquisitions, the group now claims the world's largest portfolio of CTRM solutions. Solutions from Allegro, RightAngle, Openlink, TriplePoint and Aspect provide comprehensive CTRM coverage catering for all asset classes, all deployment options, and all sizes of customer.

ION's extensive suite of offerings provides broad visibility of physical and financial assets, with real-time risk analytics and reporting capabilities. Its solutions not only integrate and automate the full range of front-, middle- and back-office functions, they also extend into logistics, shipping, market data, supply-chain and treasury offerings.

Financial Crime – Data
LexisNexis Risk Solutions

Ever-changing and ever more complex, financial crime continues to present a compliance challenge for financial institutions and corporations. New and different types of risks are emerging that organizations have to manage on an ongoing basis. With over 40 years' experience, US-headquartered LexisNexis Risk Solutions harnesses the power of data and advanced analytics to provide insights that help businesses to transact, while at the same time reducing risk by keeping out bad actors that can threaten companies' brand reputations.

Part of RELX, LexisNexis Risk Solutions ranks 16th in the *RiskTech100®*, scoring well for functionality and innovation. It also collects the category award for Financial Crime – Data for the second year in a row.

Winners in Brief

Governance, Risk Management & Compliance

Corporations

MetricStream

As risk management solutions continue to service multiple vertical industries and regions, MetricStream has secured the *RiskTech100* ® Corporations award for a third consecutive year. The US-based company has also been recognized for the breadth and depth of its GRC offerings, earning the GRC award in 2020.

MetricStream has enjoyed continued success with its cloud-based GRC platform and M7 apps. Recent developments in its cloud offerings, along with advances in predictive analytics, automation and AI, have cemented its position. Its platform provides a unified system to manage, co-ordinate and track multiple types of GRC activity, cutting across organizational silos. Headquartered in California, with an operations and GRC innovation center in Bengaluru, India, MetricStream also has sales and operations support in 12 other cities globally.

Balance Sheet Risk Management

Banking

Credit Risk for the Banking Book

Current Expected Credit Losses (CECL)

Enterprise Stress Testing

Model Validation

Pricing & Analytics – Credit

Moody's Analytics

Moody's Analytics, global provider of financial intelligence and analytical tools, has won seven categories in the *RiskTech100* ® 2020, and maintained its overall fourth-place ranking. The company retained the top spot within multiple categories, including Balance Sheet Risk Management, Credit Risk for the Banking Book, Current Expected Credit Losses (CECL) and Model Validation. It also demonstrated its continued progress by winning several awards for the first time, including Banking, Enterprise Stress Testing and the inaugural Pricing & Analytics – Credit.

Moody's Analytics has grown by innovating its solutions and through strategic acquisition. It combines deep risk expertise, expansive information resources and proprietary data with innovative technology to create solutions, made up of research, data, software and professional services.

Winners in Brief

Buy-Side

Market Risk – Buy-Side

Risk as a Service (RaaS)

Strategy

MSCI

Winner of a notable four awards in the *RiskTech100* ® is New York-headquartered MSCI. With a history dating back over 45 years, the company prides itself on its strong research background and the quality of its data and analytics. Today, MSCI is a renowned buy-side specialist and enables investment companies worldwide to define and analyze their investment strategies through its range of data and analytics products. It also has a growing managed solutions offering to support the ongoing – and increasing – drive for operational efficiency across the industry.

MSCI takes home the Buy-Side category award for a remarkable sixth consecutive year, as well as three other category awards for Strategy, Risk as a Service (RaaS), and Market Risk – Buy-Side.

Integrated Trading & Risk Management

Market Risk – Sell-Side

Murex

Murex has long been a strong player in trading and market risk. Ranking within the top 10 *RiskTech100* ® companies overall, the capital markets specialist has continued to invest in and develop its capabilities in these sectors, and has particular strengths on the trading desk for both vanilla and structured products.

Financial firms are increasingly looking to unify the front office with risk pricing and analytics; against this background Murex is Chartis' winner for both the Market Risk – Sell-Side and Integrated Trading & Risk Management awards. While these are new categories introduced this year, for Murex 2020 marks a seven-year winning streak within the sell-side, with its capital markets platform, MX.3, covering trading, risk management, collateral, operations, investment management, finance and treasury.

Winners in Brief

Financial Crime – AML

NICE Actimize
Achieving a top 10 ranking in the *RiskTech100* ®, NICE Actimize also received the Financial Crime – AML category award, securing a financial crime honor for the fifth consecutive year. As a large and broad provider of financial crime solutions for regional and global financial institutions, as well as government regulators, the company provides real-time, cross-channel fraud prevention, AML detection and trading surveillance solutions. NICE Actimize's Autonomous AML suite modernizes AML programs, combining AI, machine learning, intelligent automation and domain expertise, while creating an integrated view of the customer. In addition to its technology strengths, the company is addressing emerging AML market sectors, such as trade finance, gambling and the burgeoning financial technology sector, with specifically targeted AML solutions.

Pricing & Analytics – OTC Derivatives

xVA

Numerix
Numerix, long a market leader in OTC derivatives pricing, takes home the newly introduced award for Pricing & Analytics – OTC Derivatives. In addition, the company has won the xVA award for a third consecutive year, underlining its capabilities in the valuation space. The global provider of solutions and real-time intelligence capabilities also deserves special mention for ranking third overall within the Strategy category.

Numerix's continued investment in pricing and analytics, allied to extensive work on underlying data and the accurate modeling and structuring of curves, has kept it at the forefront of the industry. As the market increasingly adopts partnership strategies, Numerix's pricing and analytics for derivatives and xVA are growing in popularity.

Winners in Brief

Risk Technology Infrastructure

NVIDIA

NVIDIA, a pioneer in the graphics processing unit (GPU) field, takes home the award for Risk Technology Infrastructure. The US-headquartered firm has evolved the GPU into a 'computer brain at the intersection of virtual reality, high-performance computing, and AI'.

Within risk technology, GPU computing is game-changing, providing computational power that dramatically increases processing speed along with the scope and accuracy of calculations and the volume and complexity of risk simulations that can be run. NVIDIA's GPUs offer financial institutions higher speeds at lower cost. Institutions can also boost risk management, data-backed decisions, security and customer experiences with NVIDIA's AI, deep learning, machine learning and natural language processing tools.

Data Privacy

OneTrust

Data privacy is an issue that has hit prime time recently, with extensive media coverage and public pressure driving major legislation. Chartis introduced the *RiskTech100*® Data Privacy award to recognize companies tackling these crucial challenges. Award winner OneTrust, with its focus on privacy management and compliance, is a leader in critical areas including General Data Protection Regulation and the California Consumer Privacy Act. The company's modular privacy, security and third-party risk technology platform enables compliance with hundreds of global privacy and security laws. Powered by an extensive intelligence database, OneTrust adapts to its clients' jurisdictions and frameworks, generating customized dashboards. Co-headquartered in Atlanta and London, the fast-growing global firm claims more than 4,000 companies as customers.

Core Technology

Data Integrity & Control

Oracle

In an ever advancing technology landscape, the need to adopt and adapt to new techniques, tools and approaches is extremely difficult for new market entrants, and even more so for established companies. Oracle continues to build on its historical successes in developing new technology while continuously updating its existing platforms and solutions to harness new trends.

Recognizing its array of risk management technologies and solutions, and its ongoing ability to remain current in a perennially changing technology landscape, Oracle wins Chartis' Core Technology award for the third year in a row. It also retains the Data Integrity & Control award, reflecting its ongoing focus on data governance and data management, and the success of its Data Governance Studio application.

Winners in Brief

Portfolio & Factor Modelling

Qontigo

Qontigo, a newly formed Deutsche Börse Group company, was created in 2019 following the acquisition of Axioma and its merger with Deutsche Börse's existing businesses, Dax and Stoxx. Axioma's best-of-breed portfolio construction and risk analytics tools have secured Qontigo the inaugural *RiskTech100*® Portfolio & Factor Modeling award.
Qontigo combines Axioma's solutions with Deutsche Börse's world-class indexes to form a leading buy-side intelligence firm. The company plans to deliver a fully integrated, joint client proposition that builds on the indexing and the portfolio and risk analytics legacies of its businesses. It will meet the growing demand for increasingly sophisticated solutions, and address a variety of trends. These include the growth of passive investing and smart beta, the modernization of technology infrastructure for efficiency and scale, and the transition toward investment-solution customization.

Asset and Liability Management

QRM

Global enterprise risk management consulting firm Quantitative Risk Management (QRM) has long been the leader in ALM analytics and has continued to provide a benchmark for ALM systems. With a deep client base and ongoing enhancements to its solutions, QRM is Chartis' inaugural winner in the *RiskTech100*® ALM Solutions category.

Since it was founded in 1987, QRM's vision has been to consistently provide expert analytics and risk management advice to financial institutions across the globe. The company's Asset-Liability Management & Market Risk offering enables its clients to model complex assets, liabilities and off-balance-sheet instruments. For QRM, its success is the result of its strong research and development, and a consulting ethos based on collaboration and progress.

Evaluated Pricing and Data – OTC Derivatives

Refinitiv

Regulations such as Dodd-Frank and the European Market Infrastructure Regulation are putting the derivatives space under ever increasing scrutiny. To meet compliance requirements, investment professionals must show they are executing transactions at the best available price, and independent valuations are an essential part of this process. Refinitiv, formerly the Financial and Risk arm of Thomson Reuters, has proved a strong player with its approach to OTC derivatives pricing, and collects the first Evaluated Pricing and Data – OTC Derivatives award.

Covering all major financial markets, Refinitiv's Evaluated Pricing Service provides updates throughout the day, and offers users direct access to evaluators for price challenges. Refinitiv is in the process of being acquired by London Stock Exchange Group, with completion slated for the second half of 2020.

Winners in Brief

IFRS 9

Model Risk Management

Risk & Finance Integration

SAS

Financial institutions are changing their approach to risk management. The market is moving away from pure regulatory compliance – whereby solutions are aligned to specific regulatory needs – toward a more balanced mix of regulatory and business solutions that allow organizations to unlock the benefits of data that is gathered and shared across the business. Leading global provider SAS has sought to accelerate this approach with its reimagined enterprise risk management platform.

Based on an adaptive architecture, the platform is flexible enough to respond to changing market conditions and customer needs. SAS' approach has helped it take the number five spot in the *RiskTech100®* ranking, and win three category awards – for IFRS 9, Model Risk Management, and Risk and Finance Integration.

Regulatory Intelligence

Thomson Reuters

As the volume of financial services regulation continues to increase, keeping on top of regulatory developments has never been more important for financial institutions. Thomson Reuters helps firms do just that with its Regulatory Intelligence offering, and its approach has earned it the inaugural Regulatory Intelligence award.

Thomson Reuters' solution provides a comprehensive desktop tracking service of regulatory activity around the globe. It currently follows more than 1,000 regulatory bodies and more than 2,500 collections of regulatory and legislative materials, and provides thorough analysis of the content, enabling users to keep on top of regulatory changes from one single source. With the service generating over 57,000 regulatory alerts in 2018, compared with just over 12,000 in 2010, the need for such insight is only set to grow.

Winners in Brief

Liquidity Risk

Regulatory Reporting

Wolters Kluwer FRR

With a relentless wave of regulation and ever-increasing reporting requirements, firms continue to centralize and streamline their reporting processes to manage risk and avoid rocketing operational costs. With integrated regulatory compliance and reporting solutions, Wolters Kluwer's Finance, Risk and Regulatory Reporting (FRR) business continues to demonstrate its strength in this field, winning the award for Regulatory Reporting for the eighth time in nine years.

The company is also the winner of the *RiskTech100* ® Liquidity Risk category, demonstrating the considerable inroads it has made with its risk offerings in recent years. Overall, the company achieved a record year in the *RiskTech100* ®, entering the top 10 for the first time and receiving the highest Customer Satisfaction score of the top 10 players.

Customer Satisfaction

Workiva

Connected risk reporting and compliance platform provider Workiva takes home the *RiskTech100* ® Customer Satisfaction award. The US-headquartered company enables its customers to connect their risk data in a single cloud environment, reducing risk, saving time and increasing transparency and trust.

With a focus on delivering solutions in its area of expertise and engaging with its clients throughout the product lifecycle, Workiva has developed a broad set of highly satisfied customers. Serving over 75% of Fortune 500 firms, the company's culture focuses on caring for and understanding its customers' needs. Uniting a clear and focused strategy with strong customer relations has also enabled the firm to establish a loyal and committed customer base.

Rising Stars

Rising Star
Apttus

In today's digital economy, customers have high expectations of the companies they use. Pricing must be competitive, transactions must be frictionless, and communication seamlessly integrated across channels. However, while there have been many developments in digitizing the approach to front-office customer relationship management and back-office enterprise resource planning, the processes in between have remained comparatively manual, leading to a disconnect across the enterprise. Silicon Valley's Apttus helps organizations overcome this by optimizing and modernizing the traditional middle-office areas, such as relationship management, CLM and revenue recognition. Serving companies from multiple sectors, Apttus brings a digital-first approach and seeks to optimize processes using machine learning techniques in all areas, from initial onboarding to customer analysis and compliance tracking.

Rising Star
C3.ai

Digital transformation is one of the main challenges facing large traditional companies, with incumbent players increasingly losing out to digital natives. AI specialist C3.ai seeks to address this by enabling businesses to accelerate digital transformation through large-scale AI and Internet of Things applications. Founded in 2009 by serial entrepreneur Tom Siebel, C3.ai's software suite provides a comprehensive toolset for organizations to build enterprise-level AI applications 10 to 100 times faster than alternative approaches. The company typically targets large, multinational, organizations and has customers from a range of sectors. One of the key strengths of C3.ai is the breadth of use cases that it supports: from chronic disease detection in healthcare to AML and trade surveillance in banking, the applications are seemingly limitless.

Rising Star
Cassini Systems

With phases five and six of the Uncleared Margin Rules (UMR) coming into force in September 2020 and September 2021, respectively, more than 1,000 additional trading firms will be subject to initial margin under UMR. An official licensee of the International Swaps and Derivatives Association's standard initial margin model, margin analytics platform provider, Cassini Systems is well placed to help these firms address this latest compliance challenge. Founded in 2014, Cassini Systems provides advanced analytics from pre-trade to end-of-day. It seeks to enhance front-office decision-making by providing greater visibility of post-trade costs, while supporting treasury and operations with post-trade optimization. The company has formed alliances with a number of order management systems and collateral management providers, most recently announcing its integration with Tradeweb's interest rate derivatives platform.

Rising Star
Cognive

Fraud remains a constantly evolving challenge for financial institutions. Typically, legacy systems analyze different fraud types separately, but with many fraud types interlinked and occurring across business lines, this method has limitations. Californian start-up Cognive takes a different approach with its Unified Cognitive Ecosystem, which provides a full picture of fraudulent activity.

Built using distributed protocols and active AI, the system uses pre-trained modules and continually adds to its knowledge base by learning from customers' historic data and new incidents. And, because users are connected to one ecosystem, all institutions can be instantly prepared for any new incident. Cognive's approach is clearly resonating, as it already counts a number of global financial institutions among its clients.

Rising Star
Credit Benchmark
Based in London and New York, Credit Benchmark partners with financial institutions to provide a new perspective on credit risk. By aggregating and analyzing views from thousands of credit analysts at leading financial institutions, it can create new consensus data and analytics on a range of corporations, financial institutions and sovereigns.

Subscribers to the Credit Benchmark service can access datasets such as Consensus Ratings, which provides a creditworthiness measure on more than 50,000 counterparts, while contributors to the network are provided with access to exclusive analytics, such as its credit portfolio management benchmarking tool. In early 2020, it was announced that Credit Benchmark's credit risk analytics would be added to IHS Markit's Securities Finance platform, demonstrating the growing importance of consensus data.

Rising Star
CUBE
In the years since the global financial crisis, the volume of regulation financial institutions must handle has grown exponentially and the pace of change shows no sign of slowing down. Regulatory technology player, CUBE helps financial institutions navigate these ever-changing regulatory waters with its Digital Regulation Platform.

Harnessing the power of AI, the platform tracks and classifies financial services regulations to provide one of the largest single repositories of financial regulatory intelligence available. Through its regulatory change management capabilities, it then maps this intelligence onto individual policies and controls, thus providing tailored impact assessments of regulatory developments for users. Founded in 2011, CUBE now serves a variety of customers around the globe from its offices in Australia, France, the UK and the US.

Rising Star
Finxact
SaaS-based core banking start-up Finxact brings a new native cloud API-first approach to banking. Created in 2017 by industry veterans Frank and Michael Sanchez, the US company has attracted considerable financial backing from investors drawn by its fresh approach to core banking technology. Finxact's Core as a Service offering provides a modern digital banking system of record, which can be fully accessed via APIs. For the many traditional banks grappling with legacy systems, this approach offers a low-risk way of replacing existing systems. It also appeals to new digital-first banks looking for a low-cost and fast-to-market core banking platform. Finxact has also created an impressive wider-Finxact ecosystem, with recently announced partnerships including The Clearing House for real-time payments and systems integrator Deloitte Digital.

Rising Star
GTreasury
Chicago-headquartered GTreasury has been providing automated treasury management systems since 1986 but, following a $42 million investment in 2017, growth has accelerated significantly. In 2018, GTreasury acquired Australian provider Visual Risk and has integrated the two companies to provide a SaaS-based digital treasury management platform, which enables users to manage liquidity risk, market risk, counterparty risk and credit risk from a single solution. In 2019, the company enjoyed a record year, with strongest-ever growth in revenues, the addition of more than 60 new customers and product innovations, such as the addition of Goldman Sachs Liquidity Solutions Portal into its workflow. Looking to 2020, GTreasury has announced its intention to introduce machine learning for advanced cash forecasting and to make improvements to its customer onboarding processes.

Rising Stars

Rising Star
Insightful Technology
While London-based Insightful Technology can trace its roots to the late 1990s, investment in its recent Soteria solution secures the firm its 2020 Rising Star award. Soteria enables business communications – electronic or audio – to be securely captured, analyzed and stored in real time, facilitating surveillance, compliance and risk mitigation. In 2018, the company released a second version, enabling compliance with all major financial regulations, and providing a new interface with AI, business intelligence and cognitive services.

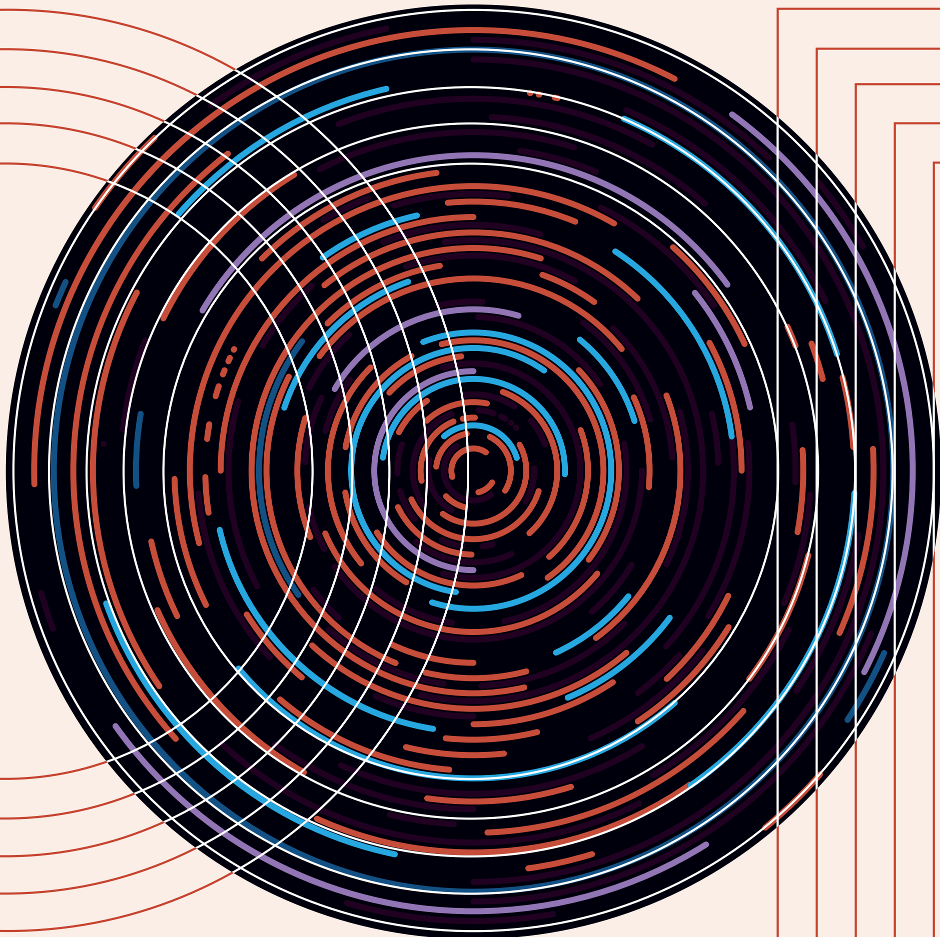
The SaaS platform is modular and scalable, and gives users a single, global, hierarchical view, with no need for middleware. As well as being a compliance tool, it also enables the on-demand collation and containerization of information for external parties such as regulators.

Rising Star
Protecht
With a range of solutions in the risk, ALM, credit risk and GRC sectors, Protecht is already established within several product lines. Protecht deserves recognition as a Rising Star in the GRC space in particular, where there is a growing need for integrated solutions that deliver strong assessment methodologies, tools, key risk indicators, audit capabilities and the ability to track actions taken. Protecht provides a visually appealing and integrated solution designed to address internal control and provide the level of detail required by company boards and external parties.

Focused on innovative risk solutions, the company has also recently sought to redefine itself with the next evolution of its online risk management software, which includes a new user interface and mobile app.

Rising Star
Signzy
Founded in 2015, *RiskTech100* ® Rising Star Signzy is an AI-based fintech company headquartered in Bengaluru, India, with offices in Mumbai, Dubai and the US. Taking a digital approach to financial institutions' onboarding requirements, Signzy uses AI and blockchain tools and techniques to bring the onboarding regulatory compliance process into line with the broader digitalization push underway across the financial services industry.

Aiming to deliver real-time KYC and core due diligence, the company's solutions deploy biometrics to provide secure digital identification and affirmed and secure digital contracts. Combining the power of document reading, facial recognition and multiple financial dataset integration, its digital onboarding systems eliminate form-filling and physical visits, replacing legacy banking processes with AI-driven technology.



INFOPRO digital