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MARKET DATA MANAGEMENT

SPECIAL REPORT

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Regulation's Impact on Data Management

Regulation is a double-edged sword. On the one hand, much of the new regulation introduced since the financial crisis is designed to prevent the kind of activities that could create another crisis. Yet it creates a compliance burden so great that it's hard to see the benefits through the forest of reporting requirements.

And in many cases, whether it be reporting risk exposure or demonstrating that a firm has sourced accurate data for portfolio valuations, these responsibilities often fall to market and reference data teams.

Many new data governance roles are designed to do exactly this—though often because it delivers value and competitive advantage, rather than because regulators demand it. And imeeting regulators' compliance often demands requires the kind of good data housekeeping that firms should find beneficial.

For example, "as collateral management becomes the next focus of regulators, any and every incorrect price will have a major impact on a financial institution's exposure with associated market risk," says Keiren Harris, principal at data consultancy DataContent. Or, put another way, meeting regulatory requirements will not only keep you compliant and prevent penalties; it will actually help your business by reducing risk.

However, firms that depend on vendors to provide the accurate data to fulfill their regulatory obligations, enforced via strict service-level agreements, legal clauses and fines in the event that a firm is penalized, they should not confuse offloading that heavy lifting with offloading their responsibilities.

"Firms cannot outsource... their ultimate responsibility for understanding the new regulatory environment and ensuring that their data is fit for compliance," says Marion Leslie, managing director of Pricing and Reference Services at Thomson Reuters.

That said, vendors are incentivized to address any issue surrounding non-compliance resulting from their service. "The biggest risk vendors face is reputational risk. If a financial institution has significant data hurdles and or internal control issues, it usually makes headlines—vendors do not want to be the known for causing such failures," says Medi Agami, partner in the Risk and Public Policy practice of research and consulting firm Opimas LLC.

Ultimately, as in any partnership, the parties must define their roles and fulfill them. As DataContent's Harris says, "Vendors and data sources must do their due diligence to ensure the accuracy of the data they are delivering, while clients must conduct continuous assessment to validate the data they are being provided with."

In short, oversight isn't just the responsibility of regulators; it's for everyone.

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NEWS ROUNDUP

Bankers Want Consultation on AnaCredit Draft Rules

The European Banking Federation (EBF) has sent the European Central Bank (ECB) a letter calling for open consultation on the upcoming draft regulation AnaCredit.

Within the next two months, the ECB's Council of Governors will be asked to approve the draft of regulation that will begin the implementation of AnaCredit, a eurozone-wide common dataset to which institutions will be required to submit highly granular credit risk information. The ECB has said this data will be used to aid its research in both its statistical and supervisory functions.

The EBF previously claimed the ECB has not consulted properly with banks, who will be the primary reporting entities, and that the requirements of AnaCredit are much greater than the initial merits and costs exercise had suggested.

The letter, from EBF chief executive Wim Mijs—addressed to ECB president Mario Draghi and dated Aug. 27—reiterates these concerns as the draft regulation evolves.

"The opinion on the draft AnaCredit Regulation that the European Commission issued recently highlighted a range of issues requiring further consideration. This opinion suggests that significant amendments may need to be made to the draft regulation," Mijs says in the letter.

Among other issues, the letter says the EBF is concerned with data protection and security, and the safety of confidential business information. The regulation has changed so much that the current merits and costs procedure carried out by the ECB "should be replaced by a preliminary public consultation and impact assessment before introducing new statistical requirements," Mijs says.

Mijs details further legal and technical concerns with the project, before concluding that these will likely result in a change to the timeframe for implementation. The ECB currently wants AnaCredit fully in place by 2020. ■

SEC Taps Kx for Data Analysis

The US Securities and Exchange Commission is to deploy tick database provider Kx Systems' Kdb+ database to help the regulator aggregate and analyze large amounts of data for use in applications such as web-based reporting tools.

Kdb+ , which has a built-in time-series query language called Q, provides unified access to streaming, real-time and historical data.

"Kdb+ is uniquely suited to the needs of regulators like the SEC, because it is the financial industry standard for trading and risk management. Proven over 22 years by the world's largest financial institutions, Kdb+ has the speed and robustness to facilitate the SEC's ability to drill into aggregate datasets at high speed," says Kx Systems chief executive Janet Lustgarten. ■

FIX Launches MiFID 2 Data, Regulatory Subgroups

Standards body FIX Trading Community has created six subgroups to address aspects of MFID 2 regulations.

The six new subgroups have been established to allow industry participants to "collaborate on the most critical issues in this time of regulatory change," including addressing regulatory technical standards proposed by the European Securities and Markets Authority (ESMA), officials say.

The subgroups will take responsibility for clock synchronization, reference data, transparency, best execution, microstructure, and order data and record keeping. ■

Citi Settles $15M SEC Fine for Compliance, Surveillance Failures

The US Securities and Exchange Commission (SEC) announced in August that Citigroup agreed to settle charges regarding its failure to enforce policies and procedures to prevent and detect securities transactions involving the misuse of material, nonpublic information.

Citi—which agreed to pay a $15 million penalty—also did not have policies and procedures in place to prevent and detect principal transactions conducted by an affiliate.

"Today's high-speed markets require that broker-dealers and investment advisers manage the convergence of technology and compliance," said Andrew Ceresney, director of the SEC's division of enforcement, in a statement. "Firms must ensure that they have devoted sufficient attention and resources to trade surveillance and other compliance systems."

The SEC investigation found Citi failed to review thousands of trades executed by some of its trading desks over a 10-year period between 2002 and 2012. While Citi employees reviewed electronically generated reports of trades on a daily basis, technological errors meant the reports omitted several sources of information about thousands of trades.

The bank also inadvertently routed more than 467,000 transactions on behalf of advisory clients to an affiliated market marker, which executed the transactions on a principal basis via buying or selling to the clients from its own account.

The SEC found Citi's policies and procedures to avoid these types of occurrences to not be reasonably designed or implemented.

The bank voluntarily paid $2.5 million, the total profits from the principal transactions, to the affected advisory client accounts. Citi also agreed to retain a consultant to review and recommend improvements to its trade surveillance and advisory account order handling and routing. ■

NY Authorities Scrutinize Symphony's Data Deletion Claims

The New York State Department of Financial Services launched an investigation into Palo Alto-based secure messaging platform Symphony in July, amid concerns that it does not comply with regulations around archiving chat messages.

Symphony, which is financially backed by 14 major financial firms led by Goldman Sachs, received a letter from the DFS asking the vendor to provide details about data retention and deletion, encryption services and open-source features.

According to the letter from acting DFS superintendent Anthony Albanese, Symphony uses the term "Guaranteed Data Deletion" and states that data is "100 percent protected by encryption keys" in its marketing collateral.

However, under NNY state law—as a result of recent currency rate-fixing scandals where regulators found evidence of foul play in chat room transcripts and other written communications—banks must now retain communication records.

In light of this, Albanese asked Symphony chief executive David Gurle to confirm whether its deletion and encryption functions will prevent regulators from being able to access banks' instant messages and other communications archives.

In addition, Albanese planned to request similar information from the banks already signed up to use Symphony, including Goldman Sachs, Bank of New York Mellon, and Credit Suisse, about how they plan to use Symphony products.

According to the letter, the DFS is concerned that it will be harder for regulators to subpoena banks' communication archives, as they will need to obtain communication records directly from banks rather than from third parties that manage the communication flow, such as Bloomberg,'s BVault archiving system.

At the time, Symphony had just released its Enterprise package for companies that want the full suite of Symphony's offering, including running the product on its private cloud, after a beta-testing period that started on April 24 and has seen the platform rolled out to 30,000 users.

Its free "Essential" package will be for users not looking for compliance or administration features. Symphony will roll this out, along with Business and Enterprise versions of the platform, on Sept. 15.

The HTML5-based platform can be accessed via a web browser, via an iPhone app (with an Android version to come), or as a desktop application for Windows and Mac computers.

There are three types of forums: one-to-one, many-to-many and persistent chat rooms. By using a "pinnin" system, users can carry on multiple conversations from the same interface.

Though Symphony is being touted as a messaging system, Gurle says that by September 2016, he envisions the system being a true workflow tool that—while it won't directly compete with the behemoth Bloomberg terminal—will serve as a tool in "á la carte" solutions. ■

CCAR Stresses Banks' Model Validation, Data Aggregation Abilities

New requirements added to the Comprehensive Capital Analysis and Review (CCAR) process by the US Federal Reserve mean that banks must meet the CCAR test every year, regardless of whether they passed it in previous years, said industry experts speaking at an event in New York hosted by Incisive Media and Chartis Research.

Morgan Stanley has passed CCAR all five times. But Jon Hill, executive director and head of market and operational risk model validation in the bank's Model Review Group, said staff "constantly feel like we're swimming upstream because every year the demands are increased." For last year's review—which Citigroup, HSBC North America Holdings, RBS Citizens Financial Group, Santander Holdings USA and Zions Bancorporation all failed—Hill's team had to work right up to the December deadline to validate all of the models necessary, he added.

The Fed has pushed the next round of reviews back until April 2016. But still, banks will now have to validate all of their feeder models, which were previously validated separately, Hill said.

"When you think about value at risk (VaR), there are over 1,000 pricing models that contribute greeks into the VaR model," he said. "We now have to revalidate every one of those models for the CCAR set of shocks to make sure that they still perform as expected."

As a result, Morgan Stanley began CCAR work in August in an effort to validate all models by year-end of, Hill said, adding that CCAR now takes up one-third of his group's bandwidth, and advising other banks to organize better, prepare well in advance of April, and get all validation and documentation in order as early as possible. "Last year, some of the documentation was being written right up to the due date for the validations," he said.

Bobby Koupparis, a quantitative risk analyst at RBC Capital Markets, added that CCAR and other requirements are increasing the demand for consolidation of risk analytics models, data aggregation and greater consistency.

Chartis managing partner Peyman Mestchian said there are still many banks with a "spaghetti" data architecture, where various groups and desks create their own risk solutions and use overlapping data, which quickly becomes costly. And then when it comes to risk system integrations, the price tag on the prep work that goes into these projects balloons quickly.

A recent study conducted by the consultancy found that 60 to 70 percent of the costs around a typical risk management system implementation concern data readiness before the analytics portion of the project kicks in, such as data cleansing, data integration, reconciliation and mapping. ■

Why Regulatory Issues Are Data Issues

Since the financial crisis, regulators' efforts to stabilize global markets and put in place checks and failsafe mechanisms to prevent similar crises in future have resulted in a barrage of new regulations that must be met by financial firms already facing their own challenges as they recover from the crisis. While well-intentioned and necessary, these regulations create a compliance and management burden that is often traced to the doors of data professionals, who for the most part appreciate that the improved data quality and oversight required for compliance with the new rules will also have a positive impact on their investments and business operations.

IMD: In an intense and fast-changing regulatory environment, what regulations apply to data provenance and management—by consolidators and consumers alike? What scale advantages can vendors bring to the table when dealing with regulated datasets or data that is used to support strictly regulated processes? What are some examples of how vendors have helped—or hindered—firms deal with compliance issues?

Virginie O'Shea, senior analyst, Aite Group: The barrage of regulatory requirements has had both direct and indirect impacts on the data management community thus far, and many more are anticipated. The general outcome of all these regulations—from the implementation of Basel III and its requirement for more accurate risk data inputs, to the onerous implementation of MiFIR in Europe—is that more information must be aggregated from across a firm (even buy-side firms are coming into the frame for the direct burden of proof, especially in Europe), new standards and formats must be adopted, and firms must provide more detailed and frequent reports to regulators, including on an ad-hoc basis. Not to mention the fact that regulators have begun talking about data quality (BCBS 239) and proof of "systems and controls" around data. You cannot outsource liability for your data, but vendors can help by providing datafeeds or systems to support all these processes. There is some merit to the argument of safety in numbers.

Brian Buzzelli, senior vice president and head of data governance, Acadian Asset Management: All regulations have application to consolidators and consumer alike. However, the drivers created by the regulations manifest differently for the following reasons: Consolidators (vendors) understand regulations from a content and capabilities perspective, with emphasis on packaging solutions to solve their perception of the business and/or technology problem. Their lens may be fundamentally grounded on various factors that immediately shape their starting point. For example, many of the large content and solution providers have huge legacy infrastructures with many products, vast client bases and core revenue streams built upon them. Established software and systems providers have original, fit-for-purpose (at the time) solutions that solved business problems prior to the ever-changing/new regulations, while younger (and perhaps more nimble) solution providers have less historical investment in terms of software or capital, and can align solutions more fit-for-purpose to solve business challenges for consumers, who share the same challenges, but at a different scale.

Regulated datasets include data standards, taxonomy (e.g. LEI), format, and all parties are working with regulators to consolidate and optimize data consolidation and aggregation to reduce complexity, cost, duplication and data misalignment due to timing in processing.

Some examples of initiatives that have helped include swaps data repositories (SDRs), central counterparty clearing (CCPs), and KYC utilities operated by Thomson Reuters, Markit, and DTCC/Clarient.

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Marion Leslie, managing director, Pricing and Reference Services, Thomson Reuters: Regulations such as BCBS239 are forcing the adoption of a number of principles fundamental to the ability to perform firm-wide risk aggregation. These include determining a data governance strategy, establishing a centralized IT infrastructure, and implementing company-wide data architecture standards. These have been on the wish list of any data management professional for many years now. At the same time, data management continues to be driven by the need to reduce cost, increase automation, and make better trading and investment decisions. In order to achieve optimal results while managing data spend, firms will need to view these regulator-mandated data burdens in a new light, and realize that the regulatory requirements are not necessarily a cost in the long run, but are in fact a growth enabler, as they present the opportunity to derive full value from content investment.

As data vendors, we seek to ensure that our content reflects the evolving market and regulatory needs, and we are in step with the changing way in which our customers want to access, use and benefit from our content. We have enterprise-wide agreements that serve the global nature of our customers' businesses, and which seek to help firms reduce cost and improve efficiency. We are in constant contact with our customers, the market, regulators, experts, industry bodies and working groups, ensuring our products and services meet the current market needs and evolve accordingly.

Medy Agami, partner, Risk and Public Policy, Opimas LLC: In its Objectives and Principles of Securities Regulation, IOSCO discusses the need for transparency, but there is no clear indication of this as a requirement or end game.

In Europe, all member countries of the European Union are subject to transparency and reporting regulations specified in Markets in Financial Instruments Directive (MiFID) and Regulation (MiFIR). This includes exchanges, vendors, and users of market data.

This is a space where the industry continues to face regulatory ambiguity caused by the complexity of requirements for market data aggregation and management globally, leaving regulators struggling to devise a uniform way of globally regulating market data.

As the complexities of market data aggregation, cleaning, usage, transparency and dissemination have increased; the burden and cost for firms to maintain proprietary market data platforms have increased respectively.

There are incredible opportunities for cost savings when firms rely on vendors for economies of scope and scale. Vendors have ultimately helped decrease the budgetary burden and increased transparency in the data management space. As financial institutions look to cut cost this is a clear area of savings. However, firms need be wary of the risks that arise from relying on vendors. Some firms have created alliances and data companies to split the cost of data management, which gives them the advantage of low costs and avoids the downside of vendor management, since they essentially, jointly, own the vendor.

Keiren Harris, principal, DataContent: The vendors have the advantage of sourcing globally, and this is a definite advantage for new datasets. In the regulatory environment, CCP data immediately comes to mind. As exchanges gain the majority of mandates for CCP reporting, it makes sense for the vendors to distribute this data to non-members, and vendors bring scale to distribution from multiple sources. This applies to all datasets; not just regulatory datasets.

For trading purposes, CCP data must be made available to the individual market participants, which limits the ability of vendors to over-charge for the data. However certain vendors have asked CCP sources for exclusive redistribution rights, which—if agreed—should be subject to necessary safeguards.

I think we will get a far better understanding of the issues, and what is causing them, once regulators have conducted more compliance audits, across a wider range of institutions, and in greater depth.

Adam Honore, chief executive, MarketsTech LLC: Much of the regulatory focus these days is on the quality, scope, and timeliness of data underlying reporting. The host of regulatory activities include Dodd-Frank, EMIR, MiFIR, BCBS 239 and others globally. Cumulatively, the expectation is that firms will produce more data of higher quality in shorter time increments. This is blowing out cost at most firms to the point where the idea of working together to reduce cost outweighs legacy thoughts of competitive differentiation. The recent SPReD initiative is a perfect example.

I'd argue that when it comes to technology, the biggest hindrance to progress comes from regulators. The requirements being designed are optimal cloud deployments (MiFIR Articles 25-27, for instance), but regulators (FINRA aside) offer little guidance and zero support. I have very recent personal experience trying to drag one of them to the table for a collaborative exercise around one of these activities that would have provided a significant win-win and got nowhere.

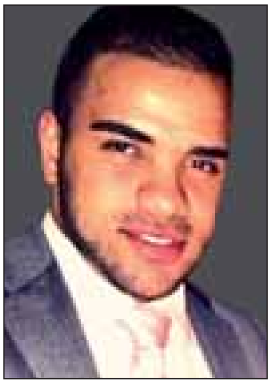
IMD: Following the credit crunch and financial crisis, what new requirements have regulators placed on market participants to ensure more accurate, verifiable and auditable data points for data other than observable prices and trades, and what kinds of processing burdens does this create for those producing and using this data?

Buzzelli: Regulators have increased the demand for accurate, verified, auditable classes of data, including the firm's clients, books, accounts, accounting, financials, risk/risk measurement, leverage, liquidity, capital reserves, information security, and compliance data. On the horizon, BCBS 239 is a fundamental change in the way regulation is being written. It outlines "key principles" of risk data aggregation that define what the firm's capabilities must be to produce accurate risk measurement and make informed risk management decisions, including the quality, timeliness, completeness, accuracy and transparency of data lineage. Previously, regulations defined the outcome (reports and/or datafeeds) and associated rules governing limits, tolerances and relationships required of financial firms. This new approach to massively improving data quality, data alignment, and "Know Your Data" (KYD) is driving three major change initiatives in the global financial industry:

First, consolidation to "best-in-class" economies of scale: Managed service providers and utility-type services are better, faster and cheaper than doing everything that does not deliver competitive advantage in-house, along with internal consolidation/simplification and/or deprecation/outsourcing of the application/data stores within firms. The use of cloud-based solutions to deliver capabilities continues to increase, as full total cost of ownership (TCO) is no longer cost effective.

Second, data governance and data quality inspection: Improved KYD has dramatically increased the scrutiny on data content, flow and quality, resulting in higher demand for more fit-for-purpose applications, architectures, workflows, and vendor data and services. Exceptional interest and adoption of thought leadership demonstrated via organizations and initiatives such as the Enterprise Data Management Council and Financial Industry Business Ontology (FIBO).

Third, vendor and industry-led solutions and shared regulations, including cross-jurisdiction regulator collaborations: There are new and expanded capabilities in the global financial markets, including the Legal Entity Identifier Foundation, central utilities and expanded vendor managed service solutions.



Medy Agami
Opimas LLC

Agami: During the financial crisis, there were vast gaps and quality issues in the data that left financial institutions and their regulators struggling to understand exposures and quantify risk positions.

At the end of the day, this becomes a governance issue. The question the industry needs to meditate on is: Who should govern and validate this market data? For internal data, firms are required to set governance processes with policies and procedures to validate their models and the data being run through it. Much dialogue is still needed, between the vendors (data providers), their clients (financial institutions), and their regulators about the roles and responsibilities of each, and who is accountable for what. It is a cumbersome and herculean process for firms to come up with an internal data governance structure—let alone a market-wide (multi-firm) data governance and management structure

Leslie: Regulation has had far-reaching impacts, variously affecting different asset classes, financial services market participants and geographies in ways that we are only beginning to understand. Yet on a practical level, firms need to source and manage the relevant content for each regulation, ensuring it is fit for regulatory reporting and compliance purposes.

Regulation and risk management across financial markets requires firms to continue their investments in data management, focusing on infrastructure, governance and data processes. Some datasets have increased in criticality and value as they have become central to reporting requirements. New regulatory data fields, changes in reporting templates and frequencies, new levels of transparency, increased auditability and new risk management requirements have fundamentally changed the way organizations look at content. Independent pricing is critical, yet it must be backed up with transparency and auditability, presenting workflow challenges for some organizations. Issuer data, counterparty data, linking securities to entities and understanding hierarchies are fundamental to the capture and aggregation of transaction and position data across the enterprise.

Firms are working closely with their partners and thinking holistically across the enterprise to solve these challenges. Departments can no longer own their own data and manage it in isolation. Chief data officer (CDO) roles are driving leadership accountability and stakeholder management for data. While the CDO doesn't necessarily manage all the data assets, he/she carries responsibility for knowing what they are and who owns them. They additionally understand the lifecycle of the content, as well as the data needs for intensified reporting requirements. As firms take control of their data assets and implement the data governance practices needed to manage their data holisti-

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cally through front, middle and back offices, they will be able to aggregate and manage risk and reporting obligations with confidence, and start to drive greater returns in performance across the enterprise.

Keiren Harris
DataContent

Harris: The focus is naturally on the over-the-counter markets, which are not only far larger than their exchange-traded counterparts, but also operate on a global basis. The US and EU have therefore gone for reciprocity where an institution can only operate in markets which have been approved by its home regulator. This has led to greater cooperation between regulators, and I believe IOSCO is paving the way with its 2013 Rules on Financial Benchmarks as a template for regulators in general to follow in terms of its four core principles: First, governance, the focus of regulators since the GFC began; second, quality, and specifically, ensuring data quality meets the standards required, which is a natural companion to governance; third, methodology—in this case, introducing common standards, terms, and conditions, especially towards defining the types of data being used, and its sources, as well as best practice, collation, calculation, and processing; and fourth, accountability—having full audit trails, databases and record keeping.

For processing of data, this becomes a question of best practice methodology. The question marks that have been raised over the calculation of CCP benchmarks are a clear case in point. As collateral management becomes the next focus of regulators, any and every incorrect price will have a major impact on a financial institution's exposure with associated market risk.

Honore: See my previous response for the regulatory examples, but don't leave storage out of the equation here as well. There are significant cumulative storage requirements of varying lengths (from five to seven years, on average) driving up the cost of compliance. It isn't just the storage. Requirements dictate readable formats and with a myriad of internally-developed and vendor solutions all supplying data in different formats and different delivery methods, there is enormous risk. Most firms have people manually checking to ensure every system delivered every file it was supposed to deliver, and that the file contains the information it is supposed to contain, because if one system fails to deliver one file for one day, that can come back on a firm years later.

O'Shea: The crisis has resulted in much more of a focus on addressing shortcomings in risk management as well as compliance. Risk management is a function that heavily relies on robust data infrastructure overall, and much more impetus being placed on a holistic approach to risk measurement and management. Just look at BCBS 239: the top-tier sell-side firms are well aware of their data shortcomings and the potential impact of these shortcomings. There is a lot of pressure to manage varied datasets to feed into more complex calculations—collateral optimization, stress testing and scenario analysis, for example—all of this needs to be based on accurate datasets.

Regulatory implementation is also reversing the usual direction of change in capital markets by driving from finance, back-, and middle-office up to the front-office, in the process breaking down operational and technology silos across asset classes.

IMD: In the event of non-compliance, which party—the service provider or client—has ultimate legal responsibility for ensuring all obligations are met, and for remedying any issues or meeting any penalties? What constitutes a "partnership" model between vendors and clients compared to traditional client-vendor relationships, and what are the benefits or disadvantages of each?

Agami: In the event of non-compliance, the burden falls on the client, since they are the one not meeting the regulatory requirement. Financial services regulators are in the business of regulating financial services firms; not third-party data providers that service them. Financial institutions can certainly hedge this by ensuring the contracts they have in place with the vendor includes legal contractual language on obligations from vendors. If the obligations are not met, the vendor faces legal ramifications, including compensating the client for lost revenue, fines, etc.

Certain service providers that deliver data are subject to regulatory oversight, but these firms are considered infrastructure providers for financial institutions (i.e. NYSE, Nasdaq, etc.), rather than pure data vendors. These firms are subject to direct fines from their regulators, as we've seen the Securities and Exchange Commission charge firms for market data issues.

The biggest risk vendors face is reputational risk. If a financial institution has significant data hurdles and or internal control issues, it usually makes headlines. And vendors do not want to be the known for causing such failures.

O'Shea: Fundamentally, you cannot outsource the liability for compliance, even in a partnership approach. You may be able to put in place punitive SLAs but the regulator will always look to the firm first in terms of penalties and resolution.

Honore: Have you ever read a regulatory notice where the vendor gets fined? That said, the recent fund pricing issue between BNY Mellon and SunGard could be an interesting case study. I've written multiple RFPs for clients with both general liability and errors-and-omissions insurance requirements, and am required by some of my clients to carry those policies myself for projects involving product design. These are becoming more common requirements, and rightly so.

Harris: Currently it is "caveat emptor." Data sources and vendors have strict contractual clauses limiting any potential liability or acceptance of any responsibility for data they pass through to their clients. This is understandable if there is no processing of the data on its way through. The questions arise over evaluated data where vendors do manipulate prices.

The best form of partnership between vendors and clients is for both to agree to define their responsibilities clearly, and ensure the data sources themselves are subject to some form of SLA. Vendors and data sources must do their due diligence to ensure the accuracy of the data they are delivering, while clients must conduct continuous assessment to validate the data they are being provided with.

The onus should be on the party at each stage delivering the data to ensure the appropriate standards are met at a minimum.

Leslie: Financial institutions are often burdened with disparate data, multiple vendor environments, complex business structures and operations. Combined with the challenges of understanding data processes, data quality levels, data usage and returns on investment, this can make compliance for end-users and their service providers alike a difficult task—not just to achieve it, but also to know who is ultimately responsible for what.

However, there are clear opportunities for efficiencies to be created as data operations are refined. These may arise from the imperative for financial institutions to adopt an enterprise approach to how they manage risk. The need to have a robust system that utilizes consistent data across the entity creates room for efficiencies to be realized. Ultimately there is little question over whether having a strong data architecture is helpful; it has become a necessity for risk data aggregation.

There are factors that currently inhibit data management practices from being as efficient as they could be. These include governance and ownership, architecture, technology, data inventory, common data dictionary and clear documented processes and procedures. Anyone in a firm who touches the data needs to be aware of their responsibilities with regards to the data "assets." The front office, for example, needs to be accountable for the quality of the data it inputs in order for the middle and back offices to use it effectively. This highlights the need for relationships between business units and central functions to evolve in a positive way in order to facilitate better data management.

There needs to be a shift away from siloed management of legacy databases. Firms cannot outsource strategic management of this process, nor can they outsource their ultimate responsibility for understanding the new regulatory environment and ensuring that their data is fit for compliance. But data vendors and service providers can play a key role in achieving this, with technology, enterprise usage models and high-quality datasets designed for enterprise use.

Brian Buzzelli
Acadian Asset Management

Buzzelli: Partnership between clients and vendor means there is a sharing of risk relative to the service provided. Otherwise, it is not a partner relationship, but a vendor/client relationship. In a partnership, both parties share in the risk, and therefore have dual responsibility for the impact of the "non-compliant" event as well as shared responsibility for the remediation and mitigating actions. Otherwise, the client owns the full responsibility in the vendor/client relationship. Note that contracts may include penalties and/or limitations of punitive actions and claims arising from issues such as non-compliance and regulatory or business impacts. The advantages and disadvantages of either model would generally be specific to a client's and vendor's willingness to accept risk and the respective firms' ability to carry that risk. Typically the sharing of risk between vendors and clients has not been the norm, but with ever-increasing utility and managed service relationships, the industry is likely moving in the direction of risk-sharing partnerships.

IMD: What metrics exist for measuring and monitoring the accuracy and performance of datasets that may be subject to any regulatory oversight, and how can firms evaluate the risks and rewards associated with specific service providers or content sets?

Buzzelli: Metrics and their disclosure—in particular, data quality metrics including completeness, timeliness, accuracy, precision and conformity—have been generally lacking from vendors that provide data content used in the financial "data factory." However, with the ever-increasing scrutiny of data quality, the rise of the chief data officer, and heads of data governance as champions for quantitative measurements of data quality, the demand for this type of data is growing rapidly. I look to excellence in other industries—in particular, manufacturing and assembly industries such as aerospace and pharmaceuticals that have optimized and advanced operations research, management and engineering with highly evolved quality metrics, measurements and instrumentation, which—along with frameworks from the early works of W. Edwards Deming through total quality management (TQM) followed by LEAN and Six Sigma—have yielded incredible levels of quality in manufacturing that give us the fastest and smallest computer chips ever made, HD LED displays, iPhones, clean pharma, composite materials and the Boeing 787 Dreamliner.

O'Shea: There are very few standards in place here. BCBS 239 is a start for principles for risk data management, but it is not prescriptive. The way that most firms measure data quality is not standardized. There has been a lot of discussion in the past about measuring market data providers in a consistent manner across firms, but this is far from being realized. As for internal data, firms have enough trouble agreeing consistent firm-wide standards, let alone looking across the industry.

Honore: Trade surveillance is a good model for this. Companies like Nasdaq (specifically, its Smarts surveillance tool), Kx Systems, OneMarketData and others have analytics built into the solutions. Couple that with machine log and network monitoring tools, and you have a good idea when data is and is not where or how it is supposed to be.

Harris: I would argue that financial institutions and vendors should measure and monitor all market data for accuracy, consistency, and timeliness, whether it is for regulatory purposes or not, as all content and datasets have a business purpose. Having benchmarking tools in place combined with periodic analysis enables evaluation to assess quality issues, where these issues originate, and if they are systemic or a one-off.

Agami: A firm's risk-reward framework for choosing a market data service provider should be commensurate with the sophistication of the firm, its business model, and its use of market data. If a firm is a market-maker, the need is usually for real-time data and the data must be validated numerous times as algorithms execute decisions based on market data. If a firm is using the data for the middle or back office, it can use delayed data for generating pricing, regulatory compliance, clearing obligations, etc.

When a financial institutions purchase a third-party model or system, they use scorecards provided by consultants to find the optimal solution. This process should be replicated when evaluating the risk-reward of choosing a market data vendor. Further, firms should establish a data structure and strategy to avoid the dependence on a single vendor.

Leslie: Thomson Reuters takes the accuracy and performance of our data, and the development of content and related expertise, very seriously. The financial markets depend on our ability to create, aggregate and deliver meaningful and accurate data and insights, but while technology is a huge enabler, and while it is possible to set up automated checks and balances, the best asset we have for monitoring data quality and accuracy is our team of professionals. In fact, it is our people that keep our content relevant, drive innovation and solve business problems. Our expertise creates differentiation in the eyes of our customers, too: Our experts engage with our customer experts to solve business challenges and create solutions. We are truly global, and our experts can be found where our customers are, aiding that collaboration and ensuring local market expertise. Managing data, technology and customer relationships together in this manner is one way to minimize the risk and maximize the reward associated with any service provider relationship.

Our Content Academy supports the learning and development of more than 5,000 data staff globally who support the financial markets, enabling the professional development of data management careers along specialist, technical and management career paths. I have also seen organizations start to realize the need for data expertise to build and grow business, including at board level. The need for 360-degree customer insight, along with strategies to retain and grow customer bases while driving productivity and innovation all require good competence in the understanding, management and interpretation of data.

The demand for data skills has never been greater across the economy as a whole and I see us as being a true center of excellence in that regard.

IMD: How do you envisage the regulatory environment changing with regard to content, given that many new sources of "data" in the form of social, crowd-sourced and unstructured data are not subject to regulatory controls or the product of regulated bodies or marketplaces?

Virginie O'Shea
Aite Group

O'Shea: I think for capital markets, we are way behind the curve in terms of being able to use unstructured data for any benefit. It is a nascent practice here comparative to other industries, so the regulatory community is unlikely to be as aware of potential issues outside of the spectrum of market abuse monitoring (this is the outlier). They have enough to worry about when it comes to monitoring and measuring (supposedly) structured financial and reference data. Just look at trade repositories or transaction reporting for proof.

Agami: This is an area where we will see much progress in the coming years. Regulators have been and will continue paying more attention to data management both for firm's internal data and market data, as we've seen with BCBS 239. Regulators have used their coercive powers to issue guidelines and rules on internal data expectations; we will see such changes in the market data arena.

The regulatory environment will focus on defining data governance across firms, data dictionaries, data quality, data usage, and pricing (which has been an issue of much debate for years now). Broadly speaking, regulators should seek to enhance quality, and transparency while not hindering innovation in this space.

Adam Honore
MarketsTech LLC

Honore: This is the Wild West. Just look at the examples of fake press releases moving the market. Or look at firms like Point72 and Bridgewater scraping every public source of data they can find. Now add in future datasets like Internet of Things content. What will a regulator do about a trading decision when the answer is, "The social sentiment score hit 4.5." How about, "The drone estimated lower crop yields." Regulators struggle with the datasets they're already responsible for overseeing. You'd be hard-pressed to defend the SIP these days regardless of which side of the HFT debate you're on.

Harris: One thing financial markets do not assess is what the data actually is. They define a descriptive instrument term—e.g., what is.a US 30-year bond—exactly, but not necessarily for the price itself. For instance, is the price quoted an indicative price or a tradable price? Too often these prices are bundled, especially by vendors and interdealer brokers. The regulators clearly prefer tradable prices, but in less liquid markets this becomes an issue, and over-regulation will act as a barrier to entry.

Personally, I believe regulators will require data sources and vendors to be fully licensed, and the data points themselves to be clearly defined. As banks themselves are major contributors of data to the marketplace, this will impact them, and we can see regulators in the future requiring all data sources to justify the prices they publish.

For the foreseeable future it will be next to impossible to regulate these new alternative data sources, nor should they try. In the world of Twitter, these alternative data sources are market drivers in their own right, and it would make for poor investment decisions to ignore them, However, users of market data will have to clearly state—and justify why— from where they source their data when using data internally and for external purposes.

Leslie: Regulation has been the consistent theme and will continue to be so throughout 2015 and beyond. Regulation is mandating changes in the way firms manage data in order to meet regulatory and risk management obligations. Tactical actions to meet deadlines will give way to strategic changes in data management processes—for sustainability, future-proofing and for returns to be generated for the organization. The majority of the strategic data management process changes are those data management professionals have advocated for many years: while regulation is a cost, good implementation can result in optimization of content investment and maximization of returns on that investment, generating insights to drive business.

Firms are free to employ whatever datasets they believe will give them an advantage, whether or not that data is sourced from a regulated marketplace, from a listed company subject to certain regulations, from a specifically regulated entity such as a rating agency, a public website or social media stream, or someone with an algorithm creating a unique new indicator in their basement or garage. However, the burden remains on the customer firms to ensure that their providers fulfill all their requirements, are in good standing, are in full compliance with their own source data providers, and can provide transparent access to any underlying source inputs and methodologies. Increasingly, end-user firms, their clients, and regulators alike are demanding to see how a price is calculated or a decision is arrived at, and while they are free to use any data, firms must still be able to justify their actions, and demonstrate, for example, that they had good reason to believe a dataset would deliver best execution. In a sense, this is a way of indirectly regulating those providers of new and often still-untested content, since financial institutions are highly unlikely to risk using data unless they are confident it will not leave them non-compliant.

As organizations deliver on regulatory needs, they must not lose sight of the fact that the investment can produce returns for the firm: improvements in risk management should enable better business decisions. Management of content across the enterprise should result in higher returns on investment and better insight into customer, employee and business performance. Unfortunately, we are still at the point where more time goes into creating a risk report, than analyzing and deriving insight from it, but this will need to change if firms are to reap the return on their investments.

Buzzelli: Financial regulations are harmonizing to some degree in the mature, developed markets. There is still the need to simplify and consolidate regulatory reporting that would reduce complexity and cost for all financial industry participants, including the regulators themselves. There will be further expansion of transparent markets, including greater emphasis on consolidated, transparent reporting repositories, and greater transparency in the non-equity (as in, everything else) instruments—especially fixed income and fixed income derivatives. Furthermore, regulators, no different than market participants, also have the same need for high-quality data that is harmonized, rationalized, and "business-ready/fit-for-purpose" for market surveillance and confirmation of regulatory adherence. Perhaps never before have the major market participants—financial firms, vendors and regulators—had such a well-recognized, shared and common goal: clean data and quality information. It is time for data quality improvement, because it really is all about the data. ■