A NEWSLETTER FOR FUND DIRECTORS

U.S. FUND DIRECTORS INSIGHT

VOLUME 2, NUMBER 2 OCTOBER 2016

ICE DATA SERVICES™

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PERSPECTIVE

In our last issue, Mark Heckert highlighted our shared vision of the centrality of market data and valuation services for financial market participants, and ICE's commitment to building new content types and platforms that let funds access data however they see fit. I would like to update you on our progress in the months since.

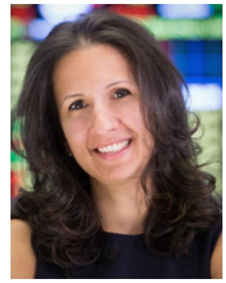
ICE continues to invest in its data services to address evolving customer needs. In June we launched an expanded ICE Data Services, bringing together proprietary exchange data, evaluated pricing, analytics, desktop tools and connectivity solutions from across ICE and the New York Stock Exchange, Interactive Data and SuperDerivatives. And we recently closed on our purchase of Standard & Poor's Securities Evaluations and Credit Market Analysis from S&P Global on October 3. We believe this transaction supports ICE Data Services' strong commitment to drive innovation and best-in-class services designed to address our customers' growing needs.

These specific actions embody our strategy for the market data business -- to provide comprehensive, mission-critical data for the front, middle and back office -- and our related commitment to continually upgrade the scope and quality of both data content and delivery methods.

As overseers of mutual funds, you are concerned with insuring integrity: of data, services and systems that your funds purchase, and of your vendors' policies and operating procedures. Integrity in all its aspects is also a central preoccupation of ICE Data Services. Our parent company, Intercontinental Exchange, operates a global ecosystem of markets, clearing houses, data services, and technology, including the New York Stock Exchange. Consequently, we share your interest in having a market structure that is secure, transparent and resilient. NYSE Governance Services regularly sponsors educational forums for board members and executives of public companies about the risks and responsibilities associated with cybersecurity. A separate subsidiary, ICE Benchmark Administration, is responsible for building and protecting important world benchmarks such as ICE LIBOR, the ICE Swap Rate and the LBMA Gold Price.

Integrating the Interactive Data business has allowed us to expand ICE Indices offerings into the fixed income space. The ICE fixed income index family that launched this year with a suite of 10 U.S. Treasury bond indices just added two U.S. corporate bond indices in October and will expand to other fixed income asset types in the coming months. Widening our index footprint will help us better support your companies' growing involvement with passive investment strategies and products -- a market segment that ICE also supports through stock exchange listings for your exchange traded products, ETF iNAV and end of day evaluated pricing.

These are just a few of the investments we are making in our data business that we think will expand the breadth and depth of services available to your firm. My highest priority is assuring that ICE Data Services continues to justify the trust that you place in us as a provider of market data and analytic tools. We are committed to maintaining and improving data quality, widening the range and functionality of delivery platforms, and developing and enforcing high standards of data governance within our own organization and encouraging similarly high standards throughout the marketplace. I look forward to meeting more of you as our integration continues.



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KEY MARKET DEVELOPMENTS AND ICE DATA SERVICES EVENTS

Directors of funds may choose to discuss with their fund advisor whether or how the market and regulatory developments listed below have impacted their funds.

THROUGH SEPTEMBER 2016

APRIL
ICE Data Services launched hourly evaluations via Interactive Data FundRun™

JUNE 8
European Parliament and E.U. Council enact benchmark regulations

JUNE 23 - 24
U.K. voted for "Brexit"; outcome triggered market volatility and resignation of Prime Minister Cameron

JUNE 27
ICE introduced expanded ICE Data Services

JUNE 28
SEC proposed business continuity rule

AUG 11
U.S. DOJ cleared ICE purchase of S&P Securities Evaluations

AUG 24
Bloomberg LP completed acquisition of Barclays Risk Analytics and Index Solutions

SEP 20
ICE Data Services Money Market Fund Reform Update webinar

SEP 21
Fed Chair Janet Yellen press conference, following FOMC policy statement

Q4-2016

OCT 3
ICE purchase of S&P Securities Evaluations closed

OCT 3
ICE Indices launched U.S. corporate bond market indices

OCT 13
SEC voted to adopt final rules addressing liquidity risk management and fund data reporting

OCT 14
SEC floating NAV compliance deadline for institutional prime money market funds

NOV 2
FOMC policy statement

NOV 8
U.S. elections for president, House and Senate

DEC
ICE Indices to launch U.S. municipal bond market indices

DEC 14
Fed Chair Janet Yellen press conference, following FOMC policy statement

NOTABLE DEVELOPMENTS

FIXED INCOME BENCHMARKS: A WORLD IN FLUX

The index world is undergoing a wide-ranging shift in response to changing investor demand and regulations. On the demand side, fixed income indices used as benchmarks are attaining a higher profile as passive investing products such as exchange traded funds proliferate and take market share away from actively managed funds.[1]

Mutual funds make regular use of market benchmarks for portfolio management, risk management, compliance and reporting, among other activities. For a passive (index-based) fund, the board may be directly responsible for approving the benchmark whose returns the fund aims to mimic. For an actively managed fund, the board is likely to review index data when preparing for discussions about periodic performance, risk measurement, and tracking error.

On the supply side, some investment banks that traditionally created and maintained market-wide branded indices are moving out of that business, while exchange operators and market data vendors (including ICE Data Services) continue to expand their presence. Index families whose administration or ownership changed since 2014 include UBS investible indices, UBS commodity indices, HSBC Asia bond indices, and the Russell family of indices.[2]

Most recently, in August 2016 Barclays PLC completed the sale of its Barclays Risk Analytics and Index Solutions business, including Barclays' broad family of fixed income indices, to Bloomberg LP. The transaction illustrates one consequence funds may face when benchmarks change hands: a change in the third-party pricing source used in calculating index values. Between the December 2015 sale announcement and its August consummation, Barclays Index staff transferred pricing for various asset-based indices from their previous pricing sources to Bloomberg's BVAL prices. When a benchmark provider changes pricing sources, funds that use the benchmark may question whether pricing vendor differences could affect either the comparability between future and historical index values or the tracking error between their own portfolios and the benchmark, as well as the quality of the pricing sources.

Regulatory pressures are often cited as an important factor driving banks to divest their index provider businesses.[3] Since the emergence and widespread adoption of the global IOSCO Principles for Financial Benchmarks[4], banking leaders reportedly view index administration as less profitable and less integral to their core business activities. The principles, which were finalized in 2013 by the International Organization of Securities Commissions, seek to address conflicts of interest in the benchmark-setting process, including submissions of data to benchmarks, content and transparency of methodologies, and governance processes. Separately, the European Parliament and the E.U. Council in June 2016 enacted a regulation on indices used as benchmarks for financial instruments or contracts or to measure the performance of investment funds.[5] Most of the E.U. regulation's provisions take effect in January 2018.

In response to the manipulation scandal, the governance of LIBOR was overhauled under the direction of an independent panel appointed by the U.K. government. In a competitive tender process, a predecessor of ICE Benchmark Administration was selected to take over the administration of LIBOR as of February 1, 2014.[6] ICE Benchmark Administration is an independently capitalized subsidiary of Intercontinental Exchange Inc. that is regulated by the U.K. Financial Conduct Authority and has been formally assessed in respect of ICE LIBOR for compliance with the IOSCO Principles.

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[1] "**As Asset Managers Struggle, Invesco Is a Relative Bargain**", The Wall Street, Journal, August 16, 2016: "...because investors are shifting out of expensive, actively managed funds and into passive ones like exchange-traded funds. This trend is likely to be accelerated by new fiduciary rules for financial advisers."

[2] In separate deals announced in January 2016, Markit Group became the administrator for UBS Investment Bank's **investible indices** and acquired three branded **Asia bond indices** from HSBC and added them to the Markit iBoxx index family. In 2014, Bloomberg took over administration and distribution of the Dow-Jones-UBS **commodity indices**, which were re-branded under the Bloomberg name. Also in 2014, London Stock Exchange Group **acquired Frank Russell Co.**, owner and operator of the Russell Index family, from Northwestern Mutual; LSE sold Russell's asset management operations in 2016.

[3] "**Bloomberg, Markit face off for bank indexes**", International Financing Review, March 3, 2016

[4] **Principles for Financial Benchmarks, Final Report**. The Board of the International Organization of Securities Commissions, July 2013.

[5] **Regulation (EU) 2016/1011** of the European Parliament and of the Council of 8 June 2016

[6] "**The Hogg Tendering Advisory Committee announces that NYSE Euronext is to be the new LIBOR administrator**" (press release), July 9, 2013

QUESTIONS TO CONSIDER

Market indices perform a crucial role in helping fund overseers and shareholders assess a fund's past performance in context of its stated risk and return objectives and compared with available alternatives. A change in ownership or administration of an index can impact relative performance and tracking error of funds if it leads to a change in the inputs (prices of component instruments) or calculation methodology for valuing the index.

To address any concerns, boards may consider questions such as the following:

- What policies and procedures has the advisor established for assessing and addressing the possible impact of a change in ownership or administration of indices used as benchmarks by our funds?
- Did the board review estimates of how recent changes of pricing sources for benchmark indices might affect:
  - Quality of prices used in valuing the indices that our funds benchmark against?
  - Comparability between recent and historical levels within each index series our funds use
  - Measurement of our funds' tracking error relative to benchmarks after the pricing source changes?
- When calculating NAV, do any funds we oversee rely primarily on pricing sources other than the pricing provider for indices the funds benchmark against?
- Are viable alternative benchmarks available whose component prices come from the same pricing source our funds use?

ICE DATA SERVICES RESPONSE

When a fund and its benchmark index do not utilize the same third-party vendor to price their respective holdings, a portion of the measured tracking error may be attributable to the incorporation of different vendors' prices for identical securities. There may be a temptation to copy the benchmark provider's choice of pricing vendor in order to avoid any such impact on tracking error. However, boards might keep in mind that relevant regulatory guidance mentions other factors, but not tracking error, as considerations when choosing a pricing vendor. As stated by the SEC in a final rule issued in July 2014[7], a fund's board of directors:

- Has "a non-delegable responsibility to determine whether an evaluated price provided by a pricing service, or some other price, constitutes a fair value for a fund's portfolio security,"
- Is obligated to "satisfy themselves that all appropriate factors relevant to the value of securities for which market quotations are not readily available have been considered,"
- Must "continuously review the appropriateness of the method used in valuing each issue of security in the [fund's] portfolio."
- When employing a valuation service, may want to assess (among other things) the service's valuation inputs, methods, models and assumptions; the quality of the service's evaluated prices; and how close the service's evaluation time is to the fund's NAV calculation time.

Boards of funds that use fixed income evaluations from ICE Data Services company, Interactive Data Pricing and Reference Data LLC, but benchmark against fixed income indices that incorporate a different vendor's prices may consider the following:

- Interactive Data Pricing and Reference Data provides evaluated pricing to 50 of the top 50 U.S. mutual funds and 50 of the top 50 global asset managers. Our quality is driven by:
  - Access to market data
  - Large, talented and experienced global evaluations staff
  - Evaluation quality control procedures
  - A robust evaluations challenge process
  - Highly responsive to client inquiries
- Many top asset managers use our evaluated prices as an input in their NAV process even when they benchmark against index families for which we are not the primary pricing vendor.
- We are available to discuss client concerns about possible "artificial" tracking error due to the use of data from different pricing vendors to value a fund portfolio and its benchmark.
- Because historical returns of funds are quoted over periods of up to 10 years, clients have expressed a preference for using at least 10 years of historical data when conducting performance back-testing measurements. Interactive Data Pricing and Reference Data LLC has been producing fixed income evaluations (including municipal securities) for over 40 years and has a robust database of evaluations and analytics.
- ICE launched the ICE U.S. Treasury Bond Index Series™ in January 2016 and U.S. Corporate investment grade and high yield indices on October 3, 2016. We plan to introduce additional fixed income indices over the remainder of 2016 and in 2017.

[7] **Money Market Fund Reform; Amendments to Form PF**, pages 286-288

The table below lists existing ICE fixed income indices followed by target launch dates (subject to change) for future indices covering additional asset types.

ICE FIXED INCOME INDICES LAUNCH ROADMAP Through January 2017	
LIVE ICE INDICES	
US TREASURY 1 – 3 YEAR BOND INDEX	
US TREASURY 3 – 7 YEAR BOND INDEX	
US TREASURY 7 – 10 YEAR BOND INDEX	
US TREASURY 10 – 20 YEAR BOND INDEX	
US TREASURY 20+ YEAR BOND INDEX	
US TREASURY INFLATION PROTECTED SECURITIES (TIPS) INDEX	
TIPS 0-5 YEARS INDEX	
US IG CORPORATE BOND INDEX	
US HY CORPORATE BOND INDEX	
REST OF 2016 / EARLY 2017	
US MUNICIPAL IG BOND INDEX	12/1/16
US MUNICIPAL HY BOND INDEX	12/1/16
US AGGREGATE BOND INDEX	1/3/17

- BlackRock has adopted ICE U.S. Treasury indices as benchmarks for seven of its U.S.-listed iShares ETFs. Direxion, Yuanta and Invesco PowerShares are using or have filed to use ICE U.S. Treasury indices as benchmarks for existing or planned ETFs.
- Interactive Data Pricing and Reference Data is the primary price source for Bank of America Merrill Lynch Indices as well as many other fixed income indices.
- To address concerns about tracking error, a fund can consider moving its benchmarks to ICE Indices or other index providers that calculate benchmark values using Interactive Data Pricing and Reference Data evaluations.
- Additional ETF and Index services available from ICE companies include stock exchange listings (including NYSE) for exchange traded products, ETF iNAV and ETF end of day pricing.

SPOTLIGHT ON BUSINESS CONTINUITY LIFTS STAKES FOR DUE DILIGENCE OF VENDORS

Asset managers' due diligence efforts on vendors are taking on a higher profile in light of a new SEC **proposed rule** on Adviser Business Continuity and Transition Plans issued in June 2016.[8]

A fund's reliance on third-party suppliers for security pricing and other data carries the risks associated with a key vendor suffering a data breach or a disruption of its activities. As with any ongoing business relationship, it is essential that a fund "kick the tires": assess the operational and business integrity and reliability of all its significant vendors both before signing a contract and regularly thereafter. Vendor management policy ties in with funds' compliance and risk management efforts, especially in relation to cybersecurity and business continuity risks.

To strengthen safeguards against cyberattacks and other threats to fund operations, the SEC has proposed requiring investment advisers to adopt and implement written business continuity and transition plans and review their adequacy at least once a year. The plans would have to include policies and procedures addressing systems maintenance and data protection, backup and recovery; ability to operate from alternate physical locations; communications with clients, employees, service providers, and regulators; identification and assessment of critical third party services; and a plan of transition if the adviser is unable to remain in operation. Regarding service providers, the rule states:

"We would generally consider critical service providers to at least include those providing services related to portfolio management, the custody of client assets, trade execution and related processing, pricing, client servicing and/or recordkeeping, and financial and regulatory reporting. Once an adviser identifies its critical service providers, it should review and assess how these service providers plan to maintain business continuity when faced with significant business disruptions and consider how this planning will affect the adviser's operations.... If the service provider does not have a BCP or if its BCP does not provide for such alternatives [to maintain services during a significant business disruption], the adviser generally should consider alternatives for such critical services, which may include other service providers or internal functions or processes..."[9]

The current proposal did not spring from a vacuum. In 2014 the SEC adopted Regulation Systems Compliance and Integrity ("**Regulation SCI**"), designed to head off systems issues and improve resiliency of market infrastructure providers including stock exchanges and other trading platforms, clearing houses and self-regulatory organizations. Turning to the funds industry, the SEC's Office of Compliance Inspections and Examinations conducted "sweeps" in 2014 and 2015 to obtain detailed information from asset management firms about their cybersecurity measures.[10] The agency's Division of Investment Management published **cybersecurity guidance** in April 2015. Since September 2015 the SEC has fined at least one asset manager and two broker-dealers for inadequate data protection.[11]

"Companies falling victim to a cyberattack should not expect any assistance or even sympathy from the government; in fact they should expect the opposite," warns John Reed Stark, president of an eponymously named consulting firm that specializes in cybersecurity and incident response. Speaking in an industry webinar in August[12], Stark mentioned "subpoenas, enforcement actions, and an onslaught of lawsuits" that the federal government and many state governments have pursued against corporate victims of cyberattacks.

Fund directors' oversight responsibilities for both business continuity and cybersecurity risks (including those arising from vendor relationships) formed a major theme of SEC Chair Mary Jo White's **address** to the Mutual Fund Directors Forum this past March. When outlining her expectations for board oversight of a fund's critical service providers, White cited a significant disruption of data flows to several fund families that occurred in August 2015. In that incident, which did not result from a cyberattack, a software glitch prevented a major fund administrator from generating fund NAVs. Clients of that fund administrator were thrown upon their own resources to calculate NAV for a number of days, during which markets were exceptionally volatile.[13]

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[8]**SEC Release No. IA-4439**, "Adviser Business Continuity and Transition Plans," states that business continuity situations generally include natural disasters, acts of terrorism, cyber-attacks, equipment or system failures, or unexpected loss of a service provider, facilities, or key personnel.
[9]**SEC Release No. IA-4439**, page 38
[10]See "**OCIE's 2015 Cybersecurity Examination Initiative**", a National Exam Program Risk Alert dated September 15, 2015
[11]Release Nos. **78021**; **77595**; and **4204**
[12]"Ignites Exchange: Lessons Learned From Cyber Slip-Ups" August 10, 2016.
[13]ICE Data Services' perspective on the August 2015 fund administrator disruption and its implications for board oversight appeared in the March 2016 edition of this newsletter.

White advised directors to proceed beyond "obvious initial questions" and generalities about a fund's key vendors, to home in on specifics such as:

- Has fund management considered the back-up systems and redundancies of the critical service providers that value the fund, keep track of fund holdings and transactions, and strike NAVs?
- Has fund management also considered specific alternate systems or work-arounds that may be necessary to continue operations or manage through potential business disruptions?

In reference to cyberattacks, White said it is incumbent upon funds and their advisers to employ "robust, state-of-the-art prevention, detection, and response plans. And it is incumbent on independent directors to consider whether the funds, advisers and other key service providers are taking the appropriate steps to do so."

QUESTIONS TO CONSIDER

Scott Margolis, director of financial services cyber-security and privacy at PwC, recommends that firms rank suppliers' levels of risk for the fund based on analyzing each supplier's respective exposure to a range of external and internal risk factors including cyberattacks, financial stability, geography, and regulatory compliance, among others. Simply gathering data about vendors' information security policies no longer passes for monitoring, Margolis says.[14]

To anticipate and manage risk of a disruption or data breach arising from a relationship with a vendor, boards could consider asking questions such as the following:

- Do we understand our fund advisor's policies and procedures for identifying and assessing service providers and their business continuity plans? Can we document the advisor's methodology for ranking vendors based on degree of risk to the fund?
- How do we satisfy ourselves that a vendor's controls related to data security are adequate and are effectively implemented?
    - Does our due diligence of vendors include requiring the vendor to respond in writing to specific scenarios involving cybersecurity or business continuity?
- Have we reviewed the fund advisor's backup plan for maintaining operations in the event that a critical service provider:
    - Suffers a temporary interruption of service?
    - Is permanently unable to provide the adviser with essential data or systems?
- Have we considered having a contingency plan in place for updating NAV on a day or days when pricing information normally received from our fund administrator, accounting system or other critical service provider, is unavailable due to a disruption?

ICE DATA SERVICES RESPONSE

ICE Data Services company Interactive Data Pricing and Reference Data LLC supports fund managers' "know your vendor" initiatives by participating in due diligence meetings, accepting invitations to present at board meetings and valuation committee meetings, and completing due diligence questionnaires our clients send us. The number of due diligence questionnaires we receive has increased substantially in 2016 compared with prior years. We believe the upturn reflects our clients' heightened attention to business continuity and information security -- two topics that account for a growing proportion of the content of our due diligence questionnaires. We expect that both the number of questionnaires and the emphasis on business continuity will increase further as a result of the SEC's business continuity rule proposal.

Interactive Data Pricing and Reference Data LLC, a Registered Investment Advisor operated as part of ICE Data Services, submitted a **comment letter** to the SEC's proposed rule on business continuity and transition plans for fund advisors.

The companies comprising ICE Data Services have formal policy or plan documents addressing the following areas. Additional information is available upon request.

- **Vendor management**: We require that our third-party suppliers take appropriate measures to provide for the continuation of the products and services delivered to Interactive Data Pricing and Reference Data clients in the event of disruptions that may affect their operations (e.g. system failure and natural or man-made disasters). The former Interactive Data business units are actively being integrated into ICE's corporate level Vendor Management Program.

[14] "**Your Q&A: How Should Firms Bolster Oversight of Vendors' Cyber Security?**" *Ignites*, December 3, 2015.

- **Business continuity** plans are in place and reviewed annually. The Interactive Data Pricing and Reference Data LLC Business Continuity Program standard calls for an ongoing awareness program for employees.
- **Disaster recovery** facilities are located in Hayward, CA and Chicago, IL, approximately 2,650 and 800 miles from their respective primary facilities in Boxborough, MA and Mahwah NJ. Recovery solutions for critical systems are in place at the recovery sites.
- **Information security** policies exist and are reviewed at least annually by the Information Security department and are approved by senior management.
  - Employees are bound by an Acceptable Use Policy and are required to complete and acknowledge in writing a Security Awareness Training Program when hired, and then as part of company-wide training every year.
  - In general, Interactive Data Pricing and Reference Data does not receive or have access to non-public, personally identifiable information regarding clients or customers of clients.

MARKET-RELATED HEADLINE NEWS

"BREXIT" VOLATILITY SPIKE HIGHLIGHTED VALUATION AND LIQUIDITY RISKS

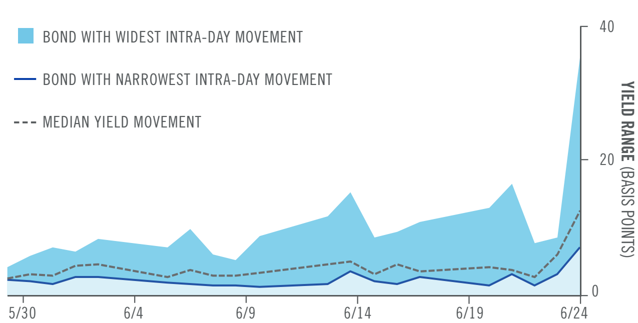
A referendum in the U.K. on June 23 resulted in 51.9% of votes cast in favor of the U.K. leaving the European Union. This outcome, known informally as "Brexit," roiled world asset and currency markets during the immediately ensuing days, as participants and policy makers reacted to the prospect of eventual shifts in trade and investment flows among the U.K., other E.U. member countries, and trading partners beyond Europe. Markets also digested a sudden unscheduled change in U.K. political leadership: Prime Minister David Cameron resigned one day after the Brexit vote and was replaced by Theresa May as leader of the ruling Conservative Party on July 11 and as Prime Minister on July 13.

Many fixed-income securities experienced unusually wide price fluctuations on June 24, the day the referendum outcome was announced. The table at right compares daily and intra-day movements in ICE Data Services Interactive Data Pricing and Reference Data Continuous Evaluated Pricing yields for 10 selected bonds of European and U.K. sovereign and bank issuers over the period from May 30 through June 24, 2016. Note that the day/day yield change averaged across the 10 bonds on June 24 was almost six times the average over the preceding 19 trading days (17.9 basis points versus 3.0 basis points), while the mean intra-day yield range on June 24 was more than three times its May 30 - June 23 average (14.0 versus 4.2 basis points).

The chart below further illustrates how the volatility spike the day after the Brexit vote affected all 10 bonds in the group, rather than one large mover inflating the group average.

Cross-Section of Daily Yield Ranges

Bonds of 10 Selected European Sovereign and Bank Issuers



Source: ICE Data Services Interactive Data Pricing and Reference Data - Continuous Evaluated Pricing.

SUMMARY OF DAILY AND INTRA-DAY YIELD MOVEMENTS
Among 10 Selected European Sovereign And Corporate Bonds

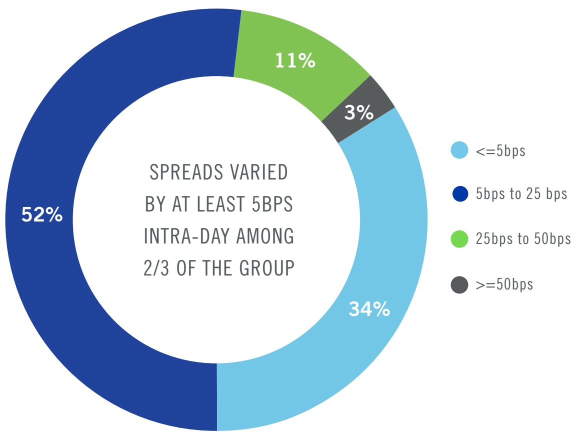
VOLATILITY MEASURE	5/30-6/23/16 (DAILY AVERAGE)	6/24/16
INTRA-DAY YIELD RANGE		
WIDEST-RANGING BOND	8.5	33.2
NARROWEST-RANGING BOND	2.0	6.8
GROUP MEAN	4.2	14.0
GROUP MEDIAN	3.6	11.9
DAY/DAY ABSOLUTE YIELD CHANGE		
LARGEST	7.5	33.9
SMALLEST	0.5	5.0
GROUP MEAN	3.0	17.9
GROUP MEDIAN	2.6	16.9

Source: ICE Data Services Interactive Data Pricing and Reference Data - Continuous Evaluated Pricing. All figures refer to evaluated yield differences, in basis points. Day/day changes reflect evaluations snapped nearest to 4 p.m. ET each day, while intra-day ranges reflect both London and New York trading hours.
The data set comprises six sovereign bonds issued by the national governments of the United Kingdom, Germany, France, Portugal, Italy, and Spain; and four corporate bonds issued by Deutsche Bank, Royal Bank of Scotland, Barclays PLC, and Unicredit. All the bonds have scheduled maturities between 2020 and 2026; their coupons range from 0.5% (German bund) to 5.9% (Spain sovereign).

Post-Brexit volatility also affected bonds traded in U.S. markets, along with foreign exchange rates. Among more than 800 U.S. dollar denominated bonds of investment grade financial issuers, two out of three experienced intra-day spread variation of 5 basis points or greater on June 24, and one in seven experienced spread variation of 25 basis points or greater.

June 24 Spread Ranges for IG Financials (USD)

Intraday Spread Movement



Source: ICE Data Services Interactive Data Pricing and Reference Data - Continuous Evaluated Pricing. Spreads are measured against the U.S. Treasury Curve, bid side.

When market volatility spikes, pricing groups may be required to review far more securities that break tolerance, making NAV calculation more challenging than usual. At the same time, risk management groups may need to assess a greater range of operational, liquidity and market risks than on a typical trading day. Reviewing market value indications throughout the trading day can help identify ahead of time and mitigate valuation risks associated with a fund's end-of-day NAV process. Intra-day valuations also can provide relevant information for board reviews of the valuation process.

QUESTIONS TO CONSIDER

Volatile price action can have lasting consequences for market participants (including funds and their shareholders) even when markets subsequently retrace part or all of their initial response to an event.[15] Fund directors also should be mindful that currency volatility can give rise to both valuation risk and market risk for international securities they hold. The following takeaways from the recent Brexit experience may help fund boards plan for the next volatility event.

Scheduled events that have evident market-moving potential -- examples include the Brexit referendum, other major elections, and central bank policy announcements -- provide opportunities to review a fund's valuation and risk management procedures with an eye toward specific event risks. Along with operational risks arising from the valuation process, the review could focus on country risk exposures, currency risks and related hedging practices, and other market risks. While risk-taking decisions and analysis of market risk factors and premia fall under the purview of a fund's investment team, the board should assess whether the right processes are in place to prevent short-term volatility or market dislocations from short-circuiting the fund's investment priorities, potentially causing actions that deviate from objectives or policies stated in the prospectus.

Periods of heightened volatility can stimulate redemption activity and may increase a fund's liquidity risk.[16] Effective monitoring and management of liquidity risk can reduce the likelihood of having to sell portfolio assets in unfavorable market conditions to meet redemptions.

When assessing the effectiveness of your funds' valuation and liquidity risk management procedures during the Brexit event and when preparing for a future market volatility event, directors may consider questions such as the following:

- How do our funds' valuation processes address market volatility?
- Have we identified and quantified reasonably foreseeable risks associated with our fund's investments in securities that could be materially impacted by future international negotiations and legislation to separate the U.K. from the E.U.?
- What steps did the fund's advisor take in advance of the Brexit vote to insure that the advisor could effectively process unusually large numbers of securities breaking daily tolerance levels?
- Did the fund have access to independent intra-day valuations for European, U.K. and U.S. fixed income securities on June 23 and June 24?

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[15] For a case study on this point in a different context, see "Swiss National Bank Removal of Currency Cap Rattled Markets," *U.S. Fund Directors Insight*, Volume 1, Number 2, page 12.

[16] SEC Division of Investment Management, "**Risk Management In Changing Fixed Income Market Conditions**,"January 2014. Also see Jiang, Li and Wang, "**Dynamic Liquidity Management by Corporate Bond Mutual Funds**," May 2016; International Monetary Fund, "**Plain Vanilla Investment Funds Can Pose Risks**," April 8, 2015, and "**The Asset Management Industry And Financial Stability**," April 2015.
On the other hand, in July 2016 the Investment Company Institute published a series of research reports that concluded that U.S.-registered mutual funds in aggregate were not substantial sellers of global equities during the weeks surrounding the Brexit referendum, and U.S. high yield bond funds in aggregate were not uniform sellers of high yield bonds during the period of significant market stress from November 2015 through February 2016. See Investment Company Institute, "**Matching Models to Reality: Bond Market Investors Don't Follow the 'First-Mover' Script**."

- Were intra-day evaluations available for only a few fixed "snap" times, or as needed throughout the trading day?

- Did the board receive and review the appropriate reports containing information such as: tolerance breaks and vendor price challenges for the period surrounding the referendum date; portfolio liquidity in advance of the Brexit vote; portfolio liquidity and redemption activity in the days after the vote?

ICE DATA SERVICES RESPONSE

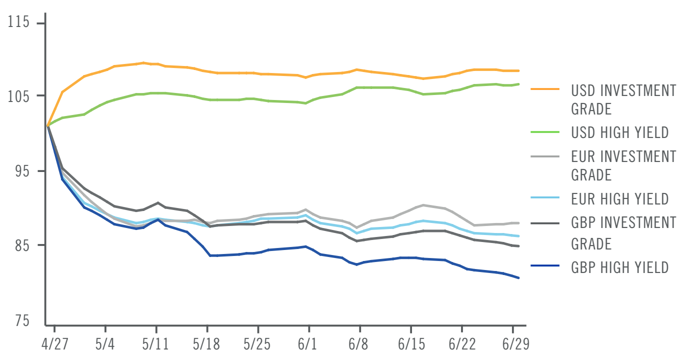
ICE Data Services company, Interactive Data Pricing and Reference Data LLC, is available to assist fund advisors and boards in carrying out their responsibilities -- including special challenges associated with value determinations and risk management that may arise during periods when markets are volatile or disrupted.

Interactive Data Pricing and Reference Data Continuous Evaluated Pricing captures intra-day market movements that impact global corporate and sovereign securities. Continuous Evaluated Pricing is updated as market information, including dealer quotes and trades, is received and processed. Using Continuous Evaluated Pricing information, a fund could calculate pro forma NAV values throughout the trading day, from 7 a.m. in London through 4 p.m. in New York, if needed. Spotlighting unusually wide intra-day daily price swings for portfolio holdings can assist a fund's staff in conducting daily tolerance assessments and identifying specific risk exposures.

Heightened market volatility can stimulate redemption activity and may increase a fund's liquidity risk. Before the volatility spike following the Brexit referendum, ICE Liquidity Indicators identified a significant drop in relative liquidity for GBP and EUR corporate bonds. The chart indicates that liquidity flows from EUR and GBP bonds into USD bonds accelerated

Liquidity Trends

April 27 - June 29, 2016



Source: ICE Liquidity Indicators
Charted values reflect average liquidity ratios among a broad basket of securities, with each series scaled to a value of 100 for April 27, 2016.

during the days immediately preceding the June 23 vote. This information could assist risk management groups in managing a fund's liquidity risk in times of potential increased redemption activity.

ICE Liquidity Indicators generates estimates of the potential number of days needed to liquidate a security, position or entire portfolio, under either normal or stressed market conditions. The service also can estimate the market price impact when liquidating a particular position over a desired number of days. ICE Liquidity Indicators may also assist a fund or board with:

- Viewing overall portfolio liquidity and tracking over time
- Enhancing board reporting through easier access to liquidity and pricing trends
- Demonstrating compliance (including stress testing capabilities) to regulators
- Incorporating liquidity as a factor in the investment decision making process

Our Business Entity Service offers a means of analyzing aggregate risk from exposure to various entities, industries and regions. Utilizing Interactive Data Pricing and Reference Data's vast reference data, the service enables users to create a clearer picture of the corporate hierarchy of an entity and identify risks associated with corporate events within the family tree of an entity.

Interactive Data Pricing and Reference Data offered the following additional resources to help clients monitor developments related to the Brexit referendum and our response:

- Separate client advisories dated June 15, June 24, June 27 and June 28 contained information and charts summarizing movements in U.K. and European sovereign bond yields, FX rates and FX options values, and equity indices.
- A free trial offer for our New York Close International Bond Evaluations for the three days bracketing the June 23 vote.
- We notified clients that we were prepared to provide complimentary access to our Fair Value Information service for eligible U.K. equities during London trading hours if the London Stock Exchange closed prematurely or did not open on June 24. (The LSE maintained its regular schedule on that day; consequently, our offer was not implemented.)

RISKS OF POLITICAL AND SOCIAL UNREST SURFACE IN DEVELOPED MARKETS

Mounting signs of social instability in the U.S. and other major economies make it prudent for funds to review their approach to political risk management and upgrade policies and related disclosures if appropriate.

The geographic locus and content of investment risks stemming from current political and social conditions has changed in 2016. Previously, expert observers in both the investing and political realms viewed civil disorder as a risk exclusive to emerging markets -- primarily frontier markets -- plus a small number of fallen-angel countries (e.g., Greece). However, recent developments raise the prospect that central governments' capacity to maintain public order could degrade even in highly developed economies, including the U.S. and the U.K.

Investopedia defines **political risk** as "the risk an investment's returns could suffer as a result of political changes or instability in a country." Its various forms can include (among others): expropriation or other economically damaging legislation, executive decrees, or regulations; violent unrest or insurrection; acts of terrorism; war; sudden adoption of currency restrictions; sovereign debt default.[17]

In the past 18 months, several U.S. corporate executives and sell side analysts have cited "civil unrest" as an influence on near-term earnings for specific companies or industries.[18] The backdrop for such concerns includes a steady stream of violent racial incidents and related protest demonstrations; and recent terrorist attacks.

- **Starbucks**: CEO Howard Schultz blamed soft June-quarter sales in part on "a confluence of social and political turmoil at home, a weakening consumer confidence, increasing global uncertainty..." He said "almost every company and every consumer brand" faces a challenging situation due to racial tensions, terrorism, and an uncertain election.
- **Motorola Solutions**: CEO Greg Brown, speaking at an investment conference this past June, mentioned unrest, terrorism and natural disasters among "external factors" that heighten public safety concerns, aiding sales of Motorola communications technology.
- **Papa John's**: KeyBanc equity analyst Chris O'Cull upgraded the pizza delivery chain's stock in July based on a thesis that civil unrest would induce more consumers to order in rather than go out for meals, improving the outlook for pizza delivery. He attributed a recent downturn in traffic at casual dining restaurants to "consumers eating more at home amid the current political/social backdrop, which we believe could last through the November election."
- **Marriott International**: In mid-2015, CEO Arne Sorenson said results for that year's second quarter "were constrained by civil unrest in Baltimore..."

At the same time, some economists, industry analysts and corporate executives say the looming U.S. presidential election is depressing consumer and business spending. The Federal Reserve **Beige Book** released September 7 cited the November elections as one factor inducing caution among firms in a number of districts. Thirteen percent of S&P 500 companies mentioned the election in their second-quarter earnings conference calls, according to a Credit Suisse research report.[19]

To be sure, political uncertainty is said to influence economic activity in most national election years. What makes this year different, however, is that uncertainty affects not only who will control the levers of government in 2017, but whether the voting and its aftermath will be orderly. The current campaign notably exceeds any of the past 10 White House races[20] in terms of both violent incidents and verbal threats of violence -- sometimes voiced by nationally prominent political figures. And some expert observers see a risk that election-related

[17]Another online business dictionary's **illustrative sentence** (one of three) for "political risk" may appear unintentionally ironic in light of current U.S. political developments: "We are lucky in the United States of American (sic) that for the most part we can run our businesses without a chance of political risk that some countries have."
[18]"**Civil unrest joining weather as common, if ambiguous, explanation for financial results**", Marketwatch.com, July 22, 2016; and
"**Analyst Upgrades Papa John's Because Growing Civil Unrest Means More Pizza Deliveries**", Bloomberg News, July 20, 2016
[19]Examples include CEOs or other top executives of McDonald's, Wendy's, Signet, Caleres, Gap, Popeyes, and Yum. "**Retailers Are Now Blaming the Election for Poor Sales**", Bloomberg News, October 7, 2016. Also see "**Wendy's puts some of blame for sales slowdown on presidential election**", Marketwatch.com, August 11, 2016
[20]"**The History of Violence on Presidential Campaign Trails**", ABC News, March 14, 2016

turmoil will extend beyond the November 8 vote, especially if the outcome is close.[21]

Civil and political disruptions can be seen in other developed countries lately -- most notably in the U.K., where a member of Parliament was murdered on June 16 because she advocated for her country to remain within the European Union. In continental Europe, public unease has spread in the wake of large-scale terrorist attacks in France and Belgium, a rash of terrorist attacks in Germany since May, and an influx of more than 1 million refugees from ongoing military conflicts in the Middle East and Africa. A public document issued by Germany's Interior Ministry in August advised citizens to stockpile sufficient water and food to carry them through a "national security threat" scenario for 5 to 10 days until the government's own emergency supplies could be distributed.[22]

QUESTIONS TO CONSIDER

Political events can be a trigger for market risk and/or operational risk, depending on the nature and duration of the event. Although investment teams bear primary responsibility for anticipating and responding to macroeconomic events that impact portfolio values, such events can pose risk management and other issues for boards to consider, as well. For example, spikes in market volatility can contribute to both valuation risk and liquidity risk for affected assets.[23] Extreme political risk events such as war or insurrection can impede a fund's portfolio companies, trading venues or investment advisor from conducting normal operations.

A recent illustration of asset market response to an unexpected political event is the U.K.'s Brexit referendum this past June, which is further described on pages 11-13 of this newsletter.

When considering risks associated with current political conditions in the U.S. or other major developed markets, boards may consider asking questions such as the following:[24]

- Have we identified and quantified reasonably foreseeable risks associated with our funds' investments in securities that could be materially impacted by civil unrest or political instability, including in developed countries?
    - Do current fund disclosures need to be modified? Do existing disclosures adequately inform fund shareholders of these portfolio risks?
- How do our funds' valuation processes address market volatility?
- Does the advisor have a means for estimating the potential number of days needed to liquidate specific positions at or near current valuation under normal and stressed market conditions?
- What adjustments, if any, do our pricing vendors apply when valuing non-U.S. fixed income holdings as of 4 p.m. ET, if markets moved substantially after European and Asian markets closed for the day?

ICE DATA SERVICES RESPONSE

ICE Data Services company Interactive Data Pricing and Reference Data LLC has been in the business of providing financial market data for more than 40 years, and has provided evaluated pricing services through various market disruptions and atypical events, including, for example: the global financial crisis of 2008-09, the flash crash of 2010, the U.S. debt ceiling crisis and downgrade of 2011, Greek selective default in February 2012 and near-default in 2015.

Our evaluations are based on market data. Our offerings that can assist fund advisors and boards with value determinations and risk management during periods when markets are volatile or disrupted include: Continuous Evaluated Pricing; Liquidity Indicators; Business Entity Services (see page 13 of this newsletter for descriptions of each offering).

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[21]University of Denver political science professor Seth Masket, in an email quoted by New York Times columnist Thomas B. Edsall: "Part of the reason that our nation has been relatively free of political violence is that losers of contests have nearly always accepted their loss and opposed the victor through legitimate means, such as challenging them in future elections or working against their agenda in Congress. The 2000 election was very close and obviously very controversial, but Al Gore nonetheless conceded after the Supreme Court's ruling." If the side that loses in November "continue(s) to argue that the election had been stolen from them," Masket wrote, "it would mean that they reject nonviolent solutions to political differences. It could jeopardize future elections, undermine the legitimacy of the federal government, and create an environment in which political violence becomes more likely." "**The Paranoid Style in American Politics Is Back**" New York Times, September 8, 2016
Also see: "**2016 U.S. Election: A Clinton Win Would Still Spell Turmoil**", OpenCanada.org, August 19, 2016;
"**The Flames of November: What if some Trump backers turn to resistance**?", Foreign Policy, August 8, 2016;
"**Hangover Wednesday: What if Clinton wins in a squeaker and some people in the country refuse to recognize the results?**", Foreign Policy, March 2, 2016; and
"**Donald Trump Is Setting a Time Bomb**", Slate, October 6, 2016

[22]"Interior Minister Thomas de Maiziere told a group of school children that Germany must be prepared to react if water or food reserves were poisoned, or if oil and gas supplies were interrupted." The BBC called this the first instance of a German government agency asking the public to store emergency supplies since the end of the Cold War.
"**Germans told to stockpile food and water for civil defence**", BBC.com, August 22, 2016

[23]See "High Yield Bond Fund Stress Raises the Bar for Board Oversight Of Both Fair Value and Liquidity", *U.S. Fund Directors Insight*, Volume 2, No. 1 (March 2016)

[24]Additional questions worth considering in this context can be found in the Business Continuity article on page 8 of this newsletter.

For U.S. mutual funds that calculate NAV as of 4 p.m. ET but may hold international securities whose local markets close prior to 4 p.m. ET, Interactive Data Pricing and Reference Data offers evaluation services that incorporate available market information after the local market close. Our offerings include Fair Value Information Service for international equities, and New York Close evaluations for EMEA and Asia-Pacific fixed income securities.

General market information observed by our evaluators is relayed to clients through our U.S. Daily Market Insight commentary and our daily Mid-Day European Market Commentary.

RECENT BOARD QUESTIONS RECEIVED BY ICE DATA SERVICES

Question: SEC regulations adopted in 2014 will require some money market funds to apply a market-based variable NAV ("floating NAV") for transactions in their fund's shares, beginning October 14, 2016. How will you support funds' compliance with the floating NAV requirement?

Answer: ICE Data Services company, Interactive Data Pricing and Reference Data LLC, has performed an end-to-end review of our processes for evaluating money market instruments submitted by our clients throughout the trading day. This required advance planning, scrutiny and updating of our workflow systems to enable receipt and rapid processing of clients' intra-day portfolio additions. We anticipate being fully prepared to support our clients' needs for intra-day floating NAV calculations in time for the October 14 SEC compliance deadline.

Intra-day evaluations have been available through our FundRun™ platform since April 2016. FundRun files populated by Interactive Data Pricing and Reference Data Continuous Evaluated Pricing are generated as of each hour from 8:00 a.m. ET through 6:00 p.m. ET. This service enhancement was developed with the help of client input obtained through a series of industry Working Group meetings comprising money market fund sponsors, fund administrators and custodians, organized by Interactive Data Pricing and Reference Data. The sessions began in 2014, the year the SEC finalized the money market reform rules.

Question: How will consolidation among pricing vendors affect the availability, quality and content of fixed income evaluation services?

Answer: Ideally, mergers may create better capitalized pricing vendors with the wherewithal to develop innovative technologies, offer comprehensive asset coverage and respond effectively to regulatory and industry changes.

Earlier this year Intercontinental Exchange (ICE) launched an expanded ICE Data Services brand, bringing together proprietary data, analytics and connectivity from Interactive Data (which ICE acquired in December 2015), SuperDerivatives, and global exchange data from across ICE and the New York Stock Exchange to offer clients a more complete view of the markets. This integration has created opportunities to consider how ICE Data Services companies may better service and support our clients going forward.

On October 3, ICE completed the acquisition of Standard & Poor's Securities Evaluations, Inc. (SPSE) and Credit Market Analysis (CMA) from S&P Global. SPSE and CMA will become part of ICE Data Services. There will be a thoughtful review of all aspects of both firms' services, with the ultimate aim of creating a "best of breed" pricing operation. The transaction positions ICE to expand coverage in derivatives and offer a multi-asset class, comprehensive source for pricing and reference data, benefiting clients of SPSE and CMA as well.

ICE Data Services understands the importance of maintaining continuity and stability for clients. SPSE, re-named "Securities Evaluations," will continue to operate separately from the existing Interactive Data Pricing and Reference Data evaluations business until sometime in 2017. Thereafter, if we find that changes are necessary, we intend to provide clients at least 3 months' notice of any content-related change and at least 6 months' notice of any file format changes.

Question: What trends have you observed in terms of boards' involvement in vendor due diligence?

Answer: During ICE Data Services' 2016 Funds Advisory Board conference, 64% of respondents in a live audience poll said their board's oversight of pricing vendors had increased in the past year. At the same time, 37% of respondents said board members had personally attended pricing vendor due diligence meetings in the past year, with an additional 6% saying board members planned to attend future due diligence meetings. Other fund firms indicated that they may invite pricing vendors to present to the full board and/or its valuation committee.

Past editions of this newsletter or any other ICE Data Services reports mentioned herein are available by request to **ICEDataServices@theice.com**

If interested in attending a meeting of the ICE Data Services Funds Advisory Board or one of our industry Working Groups, please reach out to either:

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FURTHER INFORMATION

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