



## **Fund Valuation Risk & Compliance Handbook**

2020

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## INTRODUCTION



Welcome to the 2020 edition of the Fund Valuation & Compliance Handbook. Our objective in creating this directory of firms providing services to the asset management industry is to present, in one easily accessible location, as complete and representative a list of providers in this space as possible.

As befits our field of expertise, the Handbook focuses primarily on the area of valuation and compliance with regulations, standards and best practice in this area.

It may seem like an esoteric and arcane topic to some, but the business of fund valuation is mission critical to the survival and ultimate success of the industry. Asset managers – both traditional and alternative – are now firmly on the radar of global regulators, with intense focus on standards of transparency, governance, reporting, liquidity management and fiduciary duty. This places an operational burden on funds that many are unprepared for.

Fund asset pricing is fundamental to the calculation of NAV, investor purchase and redemption prices, manager performance reports and subsequent fee income calculations, fund market risks and exposures, regulatory reporting and audits and many other key operational functions. It is little wonder, then, that regulators have focused heavily on this. In addition to specific requirements for fund pricing (such as the 1940 Act in the US and Article 19 of AIFMD in Europe), other regulations and standards relating to governance, transparency, disclosure and control of conflicts of interest also have a major impact on valuation policy and procedure.

Sound valuation is categorically not just an accounting issue. It encompasses a broad range of considerations for funds and fund managers, including the organization and structure of a Board or Governing Body to fulfil its valuation responsibilities, the fund's offering documentation, operational considerations such as staffing and training, vendor selection, SLA's and due diligence and client and regulatory reporting. To meet these needs fund's use a wide selection of service providers and this is where the Fund Valuation & Compliance Handbook comes in.

Our handbook is divided into **three sections:**

**Audit & Accounting** – The majority of funds are subject to either IFRS or US GAAP accounting standards and are audited annually under these regimes. Audit firms increasingly offer additional consulting services relating to valuation and compliance.

**Consulting & Due Diligence** – There are also a plethora of specialist firms (including ourselves) who offer services to funds and fund managers to help them to comply with their obligations. The most common of these are compliance consultants and those which perform operational due diligence (ODD).

**Software & Data Vendors** – Commercial vendors also play a crucial role in fund asset pricing. In addition to pricing and market data vendors, from where values may be directly sourced, there are also model and analytic providers who supply pricing libraries used in-house.

All of these industry segments have a part to play in the process of fund valuation and we have attempted to bring as many of them into one publication as we can. We hope that the standardization of the listing format will allow the reader to more easily identify exactly what each firm provides.

This filtering and search functionality will be even more user friendly when our online version comes on stream in the next few weeks, so watch this space!

*Ian Blance*

Ian Blance



## AUDIT & ACCOUNTING

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**The vast bulk of funds prepare periodic (usually annual) accounts in line with International Financial Reporting Standards (IFRS) or US Generally Accepted Accounting Principles (GAAP). These accounts may well be prepared by their fund administrator in their role as fund accountant, but regulations and standards require that they also be audited by a qualified professional firm.**

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Part of the audit process involves (or certainly should involve!) testing of prices used in NAV calculations. Audit firms will compare prices used by funds against other sources or with their own internal models and query any material differences. These exceptions will need to be resolved to the auditors satisfaction before they sign off on the accounts.

An added complication is introduced where Fair Value assessments are deployed. These more subjective opinions of value are naturally subject to greater scrutiny than exchange traded instruments (although it should not be assumed that a price is valid simply because it is quoted on an exchange). This process offers a greater margin for error and potential manipulation and needs to be rigorously documented and transparent.

Both IFRS 13 and FAS 157/ASC 820 require assets that are Fair Valued to be classified according to a specified hierarchy Level 1, 2 or 3 (known colloquially as 'Levelling'). This is another area of potential difficulty, with the desire for many funds to avoid having too many Level 3 assets often conflicting with the evidence. Audit firms are also required to comment on this process and attest whether the Levelling of a fund is sound and defensible.

Some best practice guidelines suggest that the funds collaborate with their auditor ahead of the audit to ensure that the Levelling exercise is done to their specifications. Whilst this will clearly avoid problems and debates during the audit itself, great care clearly needs to be taken that the fund or its manager does not place undue influence on the auditor.

In addition to auditing funds, the firms performing this function sometimes have wider professional services and consulting capabilities, and can perform other tasks such as undertaking operational control assessments like ISAE 3402. Best practice advises that such firms not provide additional consulting services to those funds they audit to avoid conflicts of interest.

This section contains the details of all the major fund audit firms – dominated inevitably by the 'Big 4'. However, in common with the other sections we also try to showcase some of the smaller firms involved specifically in the alternative side of the industry, or as niche fund auditors.



**In Transaction Advisory Services our 8,700 global professionals deliver tailored advice attuned to your needs – helping you drive competitive advantage and increased shareholder returns through improved decision-making, through services that include:**

- Lead Advisory
- Restructuring
- Operational Transaction Services
- Transaction Support
- Strategy
- Transaction Tax
- Valuation & Business Modeling

#### **Valuation**

The need for transparent and robust valuations to support corporate transactions and to meet regulatory and accounting requirements has increased. But justifying the value of assets and liabilities has grown more complex and critical for most businesses. Our experienced professionals bring excellence in accounting, taxation, and financial due diligence to provide you with valuation advice for a multitude of purposes.

#### **Modelling**

Building an effective business model, whether it's to evaluate a transaction, a new market opportunity or for other strategic purposes, is a complex and difficult task.

Our business modelling professionals can help you carry out the model review, model support and model-build activities you need to make key decisions and improve your strategic outcomes.

#### **Economic Advisory**

Economic Advisory uses the fundamental principles of economics to address client needs in the areas of policy, regulation and commercial decision making. We draw on the breadth of EY's capabilities and global reach, and underpin our work with rigorous, evidence-based quantitative analysis and deep sector expertise. Visit our webpage to find out more.

**Peter Galka**  
Partner, Transaction Advisory Services

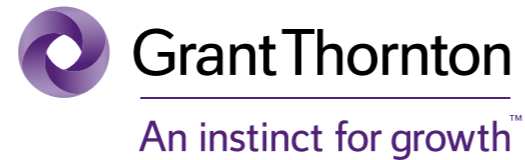
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In the complex world of financial services, no two businesses are alike. Which is why our high performance teams tailor their global insights to support your specific growth agenda. Find out exactly how at ey.com.





**The Valuations team has wide experience in valuations of companies, intangible assets and financial instruments. We serve enterprises of all types and sizes, covering a wide range of industries.**

#### **Complex Asset Valuations and Advisory Services 'CAVAS'**

Grant Thornton's CAVAS team has broad valuation, transactional and risk management experience in complex distressed, alternative and illiquid assets. Our team is dedicated to solving any complex valuation challenges in the industry, bringing a unique perspective to the valuation process.

We provide advice and solutions for acquisitions, disposals, mergers and restructuring proposals; taxation purposes; valuation of items such as trademarks, brand names, know-how, customer lists, patents and licences; dispute resolution; and regulatory and accounting matters.

#### **The Grant Thornton CAVAS team can help you achieve:**

- greater pricing accuracy and the highest levels of transparency for your entire portfolio valuation, including risk metrics
- the highest levels of transparency enabling you to comply with the Alternative Investment Fund Management Directive (AIFMD) and the Dodd – Frank Wall Street Reform and Consumer Protection Act

- sophisticated compensation arrangements for your company executives and assistance in determining fair market value for financial reporting (eg Share-based Payments under IFRS 2) or tax planning purposes
- fair value measurements for Level Three assets under IFRS 13 (or FAS 157/ASC Topic 820 under US GAAP) and understanding how these assets will affect your balance sheet as well as better assessment of credit risk in fair value measurement (CVA, DVA, FVA)
- effective risk management frameworks (eg value-at-risk, counterparty risk) and developing stress testing methodologies and procedures
- independent and consistent valuation marks for bespoke structures in energy markets, such as embedded optionality in supply contracts or investments in real assets
- efficient integration of evolving regulation and accountancy frameworks, eg Basel III, EMIR, Solvency II, IFRS IAS 39, IAS 37 and national GAAP rules
- efficient hedging strategies for your significant risk exposures

We use a variety of methodologies and models that reflect best practice in the market. Our team utilise a wide range of quality market data including interest rate, credit and inflation curves, implied volatility skews and implied correlation data for an unlimited range of assets.

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#### KNOWLEDGE AND EXPERTISE IN THE FINANCIAL SERVICES INDUSTRY

Grassi's Financial Services practice is committed to providing high-quality assurance, accounting, tax and consulting services to investment managers. Serving the industry for more than 35 years, we have the knowledge and experience to help clients navigate the complexities of this highly regulated sector. Grassi is PCAOB registered and inspected and serves clients throughout the U.S. and internationally through Moore Global.

Our industry advisors are dedicated to providing customized solutions that help you overcome industry challenges and meet your business objectives. Our clients include hedge and private equity funds, VCs, master-feeders, funds of funds, real estate, investment advisors, broker-dealers, family offices and fintech entities.

#### Assurance Services

- Financial statement audits
- SEC surprise custody examinations
- Agreed upon procedures
- Verification of investment performance

#### Tax Services

- Preparation of tax returns and investor K-1s
- PFIC reporting and FBAR filings
- Form 1042 withholding tax filings
- Representation before taxing authorities
- Tax planning and transaction structuring

#### Consulting Services

- Entity structuring and start-up services
- Business advisory
- Due diligence and transaction services
- Valuation of privately held investments

#### Fund Administration Services

- Fund accounting (maintenance of books and records)
- Full portfolio accounting
- NAV and performance returns
- CFO services
- Audit assistance and financial statement preparation
- Investor reporting

#### ABOUT THE FIRM

Grassi is ranked among the Top 100 largest accounting firms in the U.S. and has a dominant presence in the New York Metropolitan area. The Firm's Financial Services practice is headquartered in New York City and has a global presence through Moore Global, one of the largest associations of independent accounting firms in the world. Grassi's Financial Services team leverages extensive industry experience and the Moore Global network to offer domestic and offshore clients a full suite of assurance, accounting, tax and consulting services.



# WE SEE POSSIBILITIES.

Grassi's **Financial Services** advisors find opportunities to help your business grow, manage risk and stay profitable – so you can do the same for your clients. Our focus is on providing you with the practical advice and financial solutions you need to make important decisions at every stage of the business cycle.

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**KPMG's Valuation Services practice is part of KPMG's global network of member firms with more than 1,200 dedicated valuation professionals in nearly 50 countries. Our global network allows us to mobilize international teams, who have a sense of regional market conditions and can consider local issues such as taxes and market regulations, in a timely manner.**

Our Valuation Services teams have extensive experience in providing valuation services in relation to transactions, reorganizations, disputes, litigations, financial reporting, restructurings and funds.

We also work closely with KPMG's Joint Ventures teams, especially around market entry, JV set-up and exit planning and implementation.

#### How KPMG can help

We assist member firms' clients with the following:

- **Independent board advice** – to help determine the right price to pay or accept for a business
- **Investment and transactional advice** – to analyze investment opportunities, sometimes as an integral part of the due diligence exercise.
- **Fairness opinions** – advice on the fairness of the price and terms of a transaction, as required by regulatory authorities, in public takeover bids, demergers, squeeze-outs and related party transactions
- **Accounting support** – determining the value of identifiable acquired intangible assets such as trademarks, brands, technology, and customer relationships, and tangible assets such as machinery, equipment, and real estate as well as impairment reviews

- **Finance support** – in relation to equity raising of debt financing
- **Internal reorganization support** – identify and support arm's length value analysis for internal planning purposes
- **Funds** – the valuation of illiquid assets, debt securities, derivatives, liabilities and asset retirement obligations within a fund/investment
- **Restructuring** – valuation advice and disposal options review in connection with an Independent Business Review ('IBR') and independent valuation options for the benefit of an administrator (or similarly acting party)
- **Venture capital and holding company support** – establishing the value of unquoted investment portfolios can help venture capitalists and holding companies in their strategic investment decisions
- **Litigation support** – supporting litigation or arbitration, particularly expert witness and adjudication work in valuation disputes

KPMG is a global network of professional firms providing Audit, Tax and Advisory services. We operate in 155 countries and have more than 155,000 people working in member firms around the world. The independent member firms of the KPMG network are affiliated with KPMG International Cooperative ("KPMG International"), a Swiss entity. Each KPMG firm is a legally distinct and separate entity and describes itself as such.

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# Do you need to know what your business assets are worth?

Companies seek valuations for corporate governance or regulatory reasons, or because management wants to better understand value so it can make optimal decisions. In these instances, a company is often at a critical juncture – it may be planning an acquisition, resolving a shareholder or joint venture dispute, or seeking to reduce the gap between intrinsic and market value. At such a strategic time, it makes sense to seek the services of an experienced commercial valuations team.

KPMG's Valuation Services teams have the technical skills and practical deal experience to provide objective, independent advice. KPMG member firms' professionals recognize that a valuation is not a simple numbers exercise. Our approach is to focus management's attention on many of the key transactional or strategic issues that can help generate shareholder value.

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#### Mazars Services for Alternative Investments

For years, alternative investment vehicles have been under tremendous competitive pressure to increase rate of return, reduce expenses and provide special investment opportunities. All in an environment where complexity, rapid change, and regulatory shifts constantly impact asset managers. Our global asset management team understands the issues you face and can provide you with a wide range of integrated professional services, harnessing experience gained working with more than 1,000 funds across the U.S. and Europe.

#### Attest and Tax Services

Mazars provides effective, insightful services to hedge funds, private equity and mezzanine funds, specialty finance companies, and other alternative investment vehicles in the areas of:

- Auditing of funds and investment advisors
- Tax return preparation and compliance
- Tax structuring
- SEC custody examination
- Foreign reporting
- PFIC, FBAR filings, etc.
- Information Reporting, Including FATCA, CRS and CbC
- Tax accounting (ASC70 and IAS12)
- Form 1042 preparation
- SSAE 18 SOC (Type 2) Reporting

#### Investment Valuation and Financial Advisory Services

Investment valuation is a complex process requiring broad knowledge of finance and business, expert application of recognized valuation methodologies, and diligent adherence to professional standards. Sound judgment based on solid experience is of the utmost importance. Mazars provides expert independent valuation and financial advisory services to financial institutions and alternative investment vehicles in the areas of:

- Investment monitoring and valuation
- Debt, preferred stock, derivatives, intellectual property and other intangible asset valuation
- Goodwill impairment testing
- Purchase price allocations
- Employee stock option plans

#### About Mazars USA LLP

Mazars USA LLP is a high-performing accounting, tax and consulting firm with significant national presence in strategic US geographies. Since 1921, our dedicated professionals have leveraged technical industry expertise to develop customized solutions for clients, create value, and optimize their performance. We offer a broad array of industry specialists providing services to growth-oriented enterprises and individuals. As the independent US member firm of Mazars Group, we deliver seamless access to the expertise of over 24,000 professionals in 90+ countries. At local and global levels, we are proud of our value-added services, building lasting relationships with our clients and communities. For more information, visit us at [www.mazarsusa.com](http://www.mazarsusa.com).

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**Mazars' Asset Management team understands the challenges impacting the financial services industry. Our global network of experts provide tailored solutions to fit your business strategy and help you achieve your goals.**

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**ACCOUNTING | TAX | CONSULTING**

Mazars USA LLP is an independent member firm of Mazars Group.



**No matter the market, we've been there.**

**Mercer Capital's portfolio valuation advisory practice is rooted in over three decades of valuation experience. There is nothing markets can throw at you and your fund that our professionals haven't lived through. For your most challenging marks, call Mercer.**

**Why Mercer?**

**Diversified valuation practice.** Mercer Capital values business interests for a wide variety of purposes. As a result, our portfolio valuation professionals don't wear compliance blinders; our work in transaction advisory and related services keeps us rooted in markets and engenders the big picture perspective that many portfolio valuation processes lack.

**Demonstrated expertise with hard-to-value assets.** An asset may be hard to value because of inherent structural complexity or because the relevant markets are choppy. In either case, we have the experience and technical know-how to model and value complex assets, including preferred shares in development stage companies, loan portfolios, convertible instruments, and other assets with unique attributes.

**Deep industry expertise.** From financial services to technology, manufacturing, distribution, and business services, our professionals have years of experience in the industries your portfolio companies operate in. We understand the markets, trends, transactions, and challenges that shape the value of your portfolio companies.

**Experience in litigated contexts.** Audit review is one thing; regulatory review after something unforeseen has happened is another. Mercer Capital has been the expert of choice in some of the most high profile portfolio valuation-related litigations of the past decade. There is no substitute for this experience. Our experience preparing, documenting, and defending valuation conclusions in high-leverage litigated controversies cannot be matched.

**Get to know us**

Subscribe to our portfolio valuation newsletter, **Portfolio Valuation**, for our quarterly roundup of market developments and industry news.

Try us out. Call one of our professionals to discuss your portfolio valuation needs in confidence. Send us one of your assets for review, and we will let you know what we think.

experience to  
**VALUE**  
your complex assets

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## An Art and a Science

**Business valuation is part art, part science—an insightful analysis resulting from a careful review of the facts. Stakeholders seek clarity about value for a variety of reasons. Whatever your motivation may be, we believe valuations are a fundamental process for informing your decision-making and financial reporting.**

## Valuation Services

A multidisciplinary accounting and consulting firm, we provide a spectrum of fund-focused audit and tax services in addition to valuation services. With independence and transparency, our valuation professionals focus on the alternative investment sector and offer valuation services that include:

- *Fair value estimates.* Your unique situation and requirements drive our approach, incorporating best practices outlined in various FASB, industry, and advisory group recommendations, as appropriate. This includes accounting requirements under ASC 820, guidelines published by the Private Equity Industry Group, and others. Our goal is to provide supportable, replicable, and reliable marks for your illiquid, Level 2 and 3 investments—be they equity, derivative, real estate, or debt instruments.
- *Portfolio company.* There are many steps along the investment life cycle. We can assist you with pre-transaction pricing studies, structuring, diligence, and capital sourcing, as well as post-transaction allocation of purchase price under ASC 805, performance monitoring, and exit consulting.

## International Support

We began working with our first client 106 years ago and now serve clients that do business in over 40 countries. As a founding member of Praxity, AISBL, a global alliance of independent accounting firms, you have access to trusted expertise in 100-plus countries and territories around the world.

Whether you're looking for tax, US GAAP assurance, consulting, or IFRS-related services, we have the depth and breadth of experience and industry knowledge to help you navigate the complex world of international commerce.

## About Moss Adams

Moss Adams is a fully integrated professional services firm dedicated to personally assisting clients with growing, managing, and protecting prosperity. With more than 3,400 professionals across over 25 locations, we work with many of the world's most innovative leaders and companies—1,200 of which are privately held and over 130 publicly traded. Visit [mossadams.com](http://mossadams.com) to learn more.

*Assurance, tax, and consulting offered through Moss Adams LLP. Investment advisory services offered through Moss Adams Wealth Advisors LLC. Investment banking offered through Moss Adams Capital LLC.*

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# RESILIENCE RISES IN THE WEST

MARIN  
HEADLANDS,  
CA

6:02 AM  
PDT

Welcome to the coast, where we rise to meet the challenges of a changing world. As the largest accounting firm based on the West Coast, we help companies navigate COVID-19 disruption the way we always do—through innovative solutions and engaged collaboration. Discover how we can help keep your business moving forward, no matter where you're located.

RISE WITH THE WEST.

ASSURANCE  
TAX  
IT CONSULTING  
VALUATIONS  
STRATEGY & OPERATIONS  
TRANSACTIONS



*Assurance, tax, and consulting offered through Moss Adams LLP. Investment advisory services offered through Moss Adams Wealth Advisors LLC. Investment banking offered through Moss Adams Capital LLC.*



## CONSULTING & DUE DILIGENCE

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Here we are on home turf! In addition to the major firms providing legal and audit/ assurance services, there are a large number of smaller, specialist companies (such as ours) supplying traditional and alternative funds and private equity firms with advisory services.

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This advice is typically concentrated into three areas:

### **Compliance Consulting**

These firms offer a range of services to funds to assist them in complying with their regulatory obligations. This ranges from basic help with registration and reporting to fully outsourced compliance functionality, sometimes even providing a qualified Chief Compliance Officer (CCO) for the Governing Body.

### **Operational Due Diligence (ODD)**

These consultants are an interesting feature of the hedge fund world and reflect the increasing interest in, and exposure to, alternative assets by institutional investors. These investors – primarily pension funds and life insurance companies – have a much higher requirement for sound operations and compliance policies, transparency and governance than HNWI and family offices who provided the traditional funding for hedge funds.

ODD firms perform due diligence on hedge funds on behalf of these investors to ensure that the funds structure, processes and governance fulfil institutional standards and requirements.

Currently outside the scope of this Handbook is the Fund of Funds segment, who also perform these kinds of services. Many institutional investors rely heavily on FoF's for manager selection and management, and we intend to include this sector in our Handbook from next year.

### **Independent Valuation Experts**

The final major segment of the fund consulting business relevant to our Handbook is that of Independent Valuation Experts (IVE's). These firms provide specific advice and support for valuation and pricing. Some of these companies supply actual valuations to funds or their administrators, others will provide some kind of specific assurance (negative or positive) on the prices or price levels used.

Firms such as ourselves also operate at a more strategic level, providing advice and guidance on valuation policy, procedures, governance, methods and sources (including detailed due diligence of pricing vendors).

By its nature this industry segment is more fragmented than some of the others, with no real dominant players. This Handbook provides a broad cross-section of consultants operating in this space.

# ALVAREZ & MARSAL

## Alvarez & Marsal Valuation Services to Alternative Investment Funds

A&M's global Valuation Services group comprises more than 70 client service professionals based in 12 locations. Key services offered include:

- Financial reporting and tax valuations
- Fairness opinions and commercial valuations
- Portfolio valuations
- Valuation for claims and disputes

## Transparency, independence and Accountability

We possess the expertise to identify and evaluate the key financial and operational drivers of value necessary to ensure a deep partnership with companies and investors. We leverage deep industry knowledge with expertise in the audit, legal, regulatory and investor communities to help navigate the industry's perpetual crosscurrents.

We address complex valuation challenges from critical investment, regulatory and strategic perspectives to assess value at the fund, portfolio and investment level. The powerful combination of our valuation experience and A&M's restructuring and operational heritage helps private equity, hedge funds, business development companies, banks and other financial services companies address valuation issues efficiently and effectively. Our portfolio valuation services span the independent valuation of illiquid investments in:

- Debt and equity
- Derivatives and convertible instruments
- Structured products

- Commercial and contractual agreements
- Limited and general partnership interests
- Fund manager and adviser entities

We understand your need to institutionalise evolving industry best practices and are here to assist you with the preparation of internal valuation policies, as well as other risk and compliance policies necessary to ensure best in class standards.

Our portfolio advisory services include:

- Pre- and post-transaction support
- Modelling and model validation
- Regulatory valuation advisory
- Litigation support

## About Alvarez & Marsal

Privately-held since 1983, A&M is a leading global professional services firm that delivers performance improvement, turnaround management, transactional, tax and other business advisory services to organisations seeking to transform operations, catapult growth and accelerate results through decisive action. Our senior professionals are experienced operators, world-class consultants and industry veterans who draw upon the firm's restructuring heritage to help leaders turn change into a strategic business asset, manage risk and unlock value at every stage.

When action matters, find us at [alvarezandmarsal.com](http://alvarezandmarsal.com)

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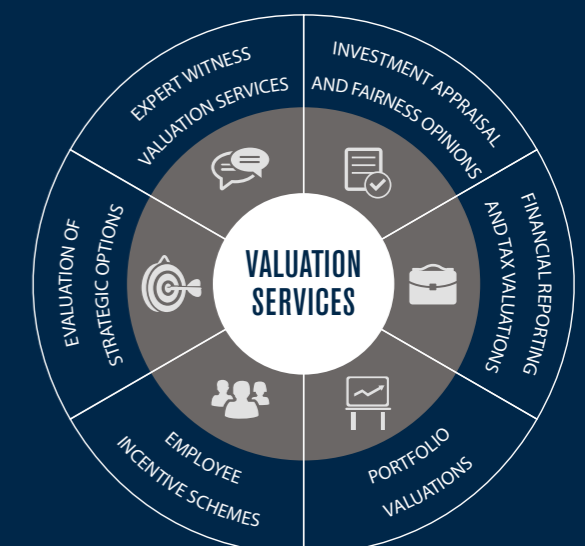
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## Alvarez & Marsal Valuation Services | Independent, Industry and Operational focussed advice

Maximising value is at the core of every senior management decision. In today's global business environment of scrutiny and transparency, all transactions are expected to be supported, reviewed and rationalised for the benefit of key stakeholders. The need for independent valuation specialists to support these transactions is increasingly vital.

A&M's Valuation Services Group operates out of 12 cities in Europe and North America. We provide objective, rational and robust valuation advice to assist our clients in their complex and challenging deliberations throughout the investment cycle.



When action matters, find us at  
[www.alvarezandmarsal.com](http://www.alvarezandmarsal.com)

ALVAREZ & MARSAL

# DUFF & PHELPS

**Duff & Phelps is the premier global valuation and corporate finance advisor with expertise in complex valuation, disputes and investigations, M&A, real estate, restructuring, and compliance and regulatory consulting. The firm's more than 2,000 employees serve a diverse range of clients from offices around the world.**

Heightened regulatory concerns and vigilance, together with increased investor scrutiny, have led to higher demand for independent expert advice. Duff & Phelps' Alternative Asset Advisory segment provides supportable, transparent valuations of illiquid, difficult-to-value investments and complex securities to issuers, investors and regulators.

We are the largest valuation firm in the alternative asset space and have valued the most diverse portfolio of complex alternative investment classes, enabling us to approach our clients' alternative investment needs with confidence.

Companies look to Duff & Phelps as both an advisor and sounding board to provide them with independent and objective advice that enables them to make the most informed decisions.

Duff & Phelps also provides merger and acquisition, financial, tax, information technology and human resource due diligence to private equity and strategic investors. Our professionals' help clients navigate all aspects of the investment cycle by focusing on value drivers and deal-breakers that are critical to investment decisions.

For more information, visit [www.duffandphelps.com](http://www.duffandphelps.com).



## Have you addressed the Independent Valuation Requirement?

Duff & Phelps is a market leader in providing illiquid portfolio pricing valuation services to the alternative investment management community, augmenting the valuation process to demonstrate the independence that is required by not only regulators but investors as well.

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# DUFF & PHELPS

Valuation and Corporate Finance Advisors

M&A advisory, capital raising and secondary market advisory services in the United States are provided by Duff & Phelps Securities, LLC. Member FINRA/SIPC. Pagenill Partners is a Division of Duff & Phelps Securities, LLC. M&A advisory and capital raising advisory services are provided in a number of European countries through Duff & Phelps Securities Ltd, UK, which includes branches in Ireland and Germany. Duff & Phelps Securities Ltd, UK, is regulated by the Financial Conduct Authority.



## HOULIHAN LOKEY

**Houlihan Lokey (NYSE: HLI) is a global investment bank with expertise in valuation, mergers and acquisitions, capital markets, financial restructuring, and strategic consulting. The firm serves corporations, institutions, and governments worldwide with offices in the United States, Europe, and the Asia-Pacific region.**

Houlihan Lokey's Portfolio Valuation & Advisory Services practice is a leading advisor to many of the world's largest asset managers due to our strong reputation with regulators, auditors and investors; private company, structured product and derivative valuation experience; and independent voice. We have valued illiquid assets on behalf of hundreds hedge funds, private equity firms, financial institutions, corporations and investors.

We have broad valuation and transactional experience in the asset management, hedge fund and private equity industries, where we serve over 300 clients annually. We provide valuations in a variety of contexts including transaction, financial reporting, taxation, corporate planning and dispute resolution.

Our team is dedicated to understanding the business issues of asset managers and we bring a valuable and unique perspective to the valuation process by offering the following:

- **Conduct independent full valuations of a wide range of illiquid assets**
- **Perform an assessment of the design and effectiveness of existing valuation policies and procedures**
- **Evaluate and/or assist in the development of valuation methodologies for various asset classes across industries**
- **Determine which assets require independent third-party valuation**
- **Provide insight into valuation best practices**

Independent advice and intellectual rigor are hallmarks of our commitment to client success across our advisory services. Houlihan Lokey is ranked as the No. 1 global M&A fairness opinion advisor over the past 15 years, the No. 1 M&A advisor for all U.S. transactions, and the No. 1 global restructuring advisor, according to Thomson Reuters. For more information, please visit **www.HL.com** or contact one of the individuals listed below:

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## HOULIHAN LOKEY

# ADVANCING YOUR VISION

Houlihan Lokey is a global investment bank with expertise in valuation, mergers and acquisitions, capital markets, valuation, financial restructuring, and strategic consulting. Over the past 40 years, Houlihan Lokey has established one of the largest worldwide financial advisory practices. Independent advice and intellectual rigor are hallmarks of our commitment to client success across our advisory services.

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- No. 1 M&A Advisor for All U.S. Transactions
- No. 1 Global Investment Banking Restructuring Advisor

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**FINANCIAL ADVISORY SERVICES**  
**FINANCIAL RESTRUCTURING**  
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**HL.com**

Investment banking services provided by Houlihan Lokey Capital, Inc.; financial advisory services provided by Houlihan Lokey Financial Advisors, Inc.; strategic consulting services provided by Houlihan Lokey Consulting, Inc. In the European Economic Area, Hong Kong and Australia services provided by Houlihan Lokey (Europe) Limited, Houlihan Lokey (Financial Advisory) Limited, Houlihan Lokey GmbH, Houlihan Lokey (Netherlands) B.V., Houlihan Lokey (España), S.A., Houlihan Lokey (China) Limited and Houlihan Lokey (Australia) Pty Limited, respectively. Source: Thomson Reuters.



## The Specialist Valuation Provider for Illiquid Credit Trades

**TRANSPARENT   TIMELY   INDEPENDENT**

Oxane Partners' independent valuation services help clients meet their strategic, transactional and regulatory imperatives. We perform independent valuations, model validations, stress testing and impairment analyses to assess the fair market value of a broad range of illiquid and hard to value alternative assets. An array of financial institutions including hedge funds, fund managers, alternative lenders, private equity firms, private credit funds, trading desks of investment banks rely on the depth and coverage of our independent valuation practice.

### Why Oxane Partners

- **Fully independent valuations** as we do not hold any investment positions
- **Leverage proprietary technology** to streamline data management, while our experts focus on the investment thesis, market data and valuation methodology
- **Seasoned valuation team** with 150 years of cumulative credit trading experience
- **Transparent methodology** and robust valuation processes ensuring marks are transparent and defensible
- **Timely and extremely responsive** in addressing queries from clients, fund administrators, auditors or tax authorities
- **Ensuring compliance** with all directives such as IFRS 9, MIFID II, AIFMD, ESMA, GDPR etc.
- **An SSAE18 accredited environment** for the valuation process
- **Recognized** in multiple European and US Valuation Services awards.

### Our Coverage

#### Structured Products

Private ABS trades

#### Portfolio Trades

Secured and unsecured non-performing loans, re-performing loans, forward flow portfolios, leasing portfolios, reverse mortgages, and other consumer or commercial loan portfolios

#### Illiquid Debt

Mezzanine debt, private placements, litigation financing etc.

#### Real Estate

Senior debt, whole loans, mezzanine debt, development financing

Headquartered in London, with additional offices in New York and New Delhi, our team of more than 100 analysts empower over 75 institutional clients across the globe.

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**Mynarski is a benchmark in the market for company valuations and asset management. Founded in 1991, it actively participates in the implementation, maintenance and development of the international standards of valuations and complete asset management, being the main company of the sector in Latin American market and the first and only member of IVSC – International Valuation Standard Council in South America.**

The quality, technology, processes and commitment are key points offered by Mynarski, which aims to conquer the global market of company valuations and asset management.

Mynarski is present in the main international congresses and valuations meetings, finances and accounting. Differentiating from other companies, Mynarski follows the services from start to finish of processes, performing unique, differentiated steps and achieving optimized results and solutions.

Mynarski's performance in 2019 exceeded 1.361.000 assets processed and appraised, representing a growth of 51% over the previous year.

#### **Our Solutions**

##### *Assets valuation*

Fundamental to define the value and useful lives of the assets, to update the accounting and financial positions and to avoid problems in the economic operations.

##### *Business valuation*

Examines various business factors, defines the value of the company, business and intangible, creating a reliable support for the negotiations.

##### *Business combination*

An economic transaction where companies carry out partial or total purchase and sale operations.

##### *Asset management*

Good practices to organize the company's assets and their economic, fiscal, accounting, risk analysis and optimized asset management.

##### *Stock*

Organization and updating of stocks to guarantee/allow financial control, physical, efficiency and avoid waste.

##### *Software*

Modern software for patrimonial control, control of movement and reinventories.

##### *Appraisal Review*

Appraisal Review is a common process in the business world and serves to analyze the processes and methods of third-party appraisals and can validate or request clarification on reports and increase the safety of business operations.

##### *Maintenance*

Maintenance plan based on the reconciliation of the fixed asset base with the maintenance register, create a single basis for integrated fixed asset and maintenance management.

##### *Artwork Valuation*

The artworks have economic values that vary according to their exclusivity, components, fame and other relevant factors.

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Valuers supporting investments in  
**research**  
**education**  
**technology**  
**culture**  
and all other sectors of the economy.

Mynarski International Valuation is a multidisciplinary appraisal company with members in IVSC, ASA and RICS.

Mynarski performs appraisals and valuation for financial reporting, business combination, financial services and insurance.

In addition to valuations are carried out fixed asset management, mergers and acquisitions, stock management, specialized software, appraisal review, maintenance plan management for local and global companies.





**In an environment of volatile markets, potential conflicts of interest, and regulatory changes, it is critical for fund and investment managers to hire an advisor who can help them navigate the valuation process, provide objective advice, and withstand scrutiny from all sides.**

We understand the complexity of valuing financial instruments such as illiquid equity, debt, and derivatives. We have a proven track record of helping clients gain confidence in their fair value reporting, and we provide insight in developing clients' policies and procedures.

With Stout, you can count on advice that is independent, objective, and well-documented. Our defensible valuations comply with relevant reporting standards and policies that meet best practices, ensure consistency, and offer transparency.

**Whether you need help with regular reporting requirements or with an unplanned need, our professionals have:**

- industry expertise across a wide range of sectors
- advanced degrees in financial engineering and other advanced analytics fields
- qualifications to value the most complex financial instruments
- relationships with major accounting firms to help navigate the process
- experience in supportable fair value measurements in accordance with ASC 820 for multiple asset classes including:

- Senior and subordinated debt
- Unitranche loans
- First-out/last-out term loans
- Convertible debt
- Preferred and common stock
- Warrants and options
- Hybrid securities
- Fixed income and interest rate derivatives
- Structured products
- Financial guarantees

#### Who We Serve

- Public and private business development companies (BDCs)
- Private equity, private debt, and hedge funds
- Collateralized debt and loan obligation companies
- Insurance companies
- Regional, commercial and Investment Banks
- Fortune 100 corporations to privately held companies

Stout is a global advisory and consulting firm specializing in Investment Banking, Valuation Advisory, Dispute Consulting, and Management Consulting services. We serve a range of clients, from public corporations to privately held companies in numerous industries throughout the world. Our clients and their advisors rely on our premier expertise, deep industry knowledge, and unparalleled responsiveness on complex matters. Learn about our Relentless Excellence® at [stout.com](http://stout.com).

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Turning complexity into  
**CLARITY**

#### STOUT VALUATION ADVISORY Relentless on your behalf.

Uncovering true value requires a clear lens. As one of the largest valuation practices in the country, Stout has specialized expertise in the valuation of business enterprises and their underlying assets – both tangible and intangible – and the experience to deliver reliable opinions that can withstand scrutiny from any party. With essential resources at your disposal, we bring clarity to the most complex valuation matters. Let us relentlessly deliver for you.

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Investment Banking | Valuation Advisory | Dispute Consulting | Management Consulting



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A background image of a financial chart, likely a candlestick chart, with various price points and a moving average line. The chart is overlaid on a grid. A dark purple rectangular box is positioned at the bottom left, containing the text 'SOFTWARE & DATA VENDORS' in white, sans-serif, uppercase letters.

# SOFTWARE & DATA VENDORS

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**The use of third party vendors by fund managers and their administrators has already been highlighted. Over recent years there has been an explosion of new firms starting up in this part of the industry.**

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We believe that the vendor segment related to valuation in its broadest definition breaks down into five main sub-sectors:

## **Pricing & Valuations**

This is the direct provision of pricing and valuations data to end-users. These can be a variety of different price types (trade, broker, composite, evaluated, etc.) in a wide range of asset classes (fixed income, securitized products, derivatives, real estate, ...), but the underlying purpose is to supply a price (or range of prices) for a financial instrument which can be used by the consumer to meet their valuation obligations.

## **Models & Analytics**

There are a number of firms who do not provide pricing, but rather the analytical means to produce it. This is a highly specialist and technical field, populated by mathematicians and 'rocket scientist' quants, often refugees from the major investment banks and/or academia.

## **Input & Calibration Data**

The very best model is only as good as the data which fuels it! Often neglected, but absolutely critical to the valuation process, is the underlying data used to populate and calibrate pricing models. This includes yield curves, credit estimates and spreads, prepayment speeds, probabilities of default, terms and conditions data, volatility surfaces and much more.

## **Derived Products & Applications**

Valuation is done for a reason – not just for the intrinsic delight it provides! That reason may be external client/regulatory reporting or internal trading and risk management, but there is a fundamental purpose to the periodic production of a price. Some of these downstream uses have applications to valuation risk, such as index production and analytics and the creation and management of risk measures.

## **Data Management**

The vast volumes of data required to be accessed, managed, cleaned, compared, processed and analyzed presents users with a serious challenge. Spreadsheets are deployed, of course, but the scale of the issue had led to the development of a number of commercial applications designed solely to manage the data for these purposes. Often described as Enterprise Data Management (EDM), the pricing component of these packages are a major industry.

This section contains details of the major vendors supplying products and services relating to asset valuation applicable to investment funds and their administration.



**AVS-Valuation GmbH (AVS) is recognized as a certified company for asset servicing for all kind of financial instruments from liquidly traded to complex and illiquid ones such as structured products, OTC Derivatives and other tailor-made instruments.**

AVS is a privately hold, independently operating company which was founded 2010. The valuations are neutral, independent, transparent and reliable. As a key principle valuation are unbiased, based on data analyses carried out internally, on own models and market assessments.

AVS provides among others custodian Banks, investment banks, insurance companies, asset managers, investment companies, pension funds.

#### Valuation Requirements

- AIFM & UCITS Directives
- KARBV
- Basel III, Solvency II
- Financial Statements
- Regional Valuation Guidelines
- European Market Infrastructure Regulation
- European Long Term Investmentfunds
- Risk Management
- Scenario analysis & stress testing
- Market Conformity, Security Lending
- Collateral Management
- Reporting, Monitoring
- Derived trading information

#### Valuation Portfolio

- 1) Fixed Income** (Including liquid, semi-liquid, illiquid, structured instruments)
- a) Bonds, Loans, Structured Credit (ABS, CLO, CDO), Structured Products (rates, real assets, aviation, shipping...)

#### 2) Derivatives

Including all kind of complexities and underlyings like:

- a) Interest Rate Derivatives (FRN, Caps, Callable, Swaps, CMS, Accrual)
- b) Equity-Linked Derivatives (Convertibles, Options, Warrants)
- c) FX-Linked Derivatives (Dual Currency, Quanto, FX Forward)
- d) Inflation linked Derivatives
- e) Volatility Derivatives
- f) Credit Derivatives

#### 3) Alternative Assets

Including among others Renewable Energy, Real-Estate, Infrastructure, Microfinance Loans, Private Equity, Aviation & Shipping, Security Tokens (Cryptos)

#### Services

- Valuations
- Bespoke developed regulatory services
- Project management / coordination
- Market conformity check
- Mark to Model check
- Monitoring & Reporting
- Risk Analysis
- Risk Advisory

#### Certification

AVS procedures are annually audited and IDW PS 951 approved (German equivalent of SAS 70 / ISAE 3402) and aims to provide services on the highest possible standards.

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DATA FEED USE CASE RECOMMENDATIONS

**HISTORICAL DATA** - Access years of historical data on single name bonds or loans. End of day composite pricing on portfolios or full universe going back to 1997.

**DERIVED DATA** - Best Credit Data supports daily delivery of yields, spreads and other derived data points such as Z-Spread, OAS, ASW and more. Ongoing daily feeds are available as well as historical data in one cost effective solution.

**MUTUAL FUND ACCOUNTING** - Best Credit Data works with mutual fund clients to provide the timely delivery (4:30 PM ET) of portfolio based pricing files for utilization in calculating mutual fund net asset values. Best Credit Data likewise works with 3rd party processors in the event that the NAV calculation process is outsourced.

**CUSTODY, TRUST & WEALTH MANAGEMENT** - Best Credit Data provides either portfolio based or full universe pricing files for processing via custody, trust and wealth management applications. Depending on client requirements, files are delivered on either a daily, weekly or monthly schedule.

**SEPARATELY MANAGED ACCOUNTS** - Best Credit Data also supports the delivery of pricing files to facilitate the valuation of separately managed accounts. Best Credit Data can modify the file format to ensure compatibility with all 3rd party accounting applications.

**COLLATERAL, RISK MANAGEMENT & COMPLIANCE** - Best Credit Data works with many firms to power collateral, risk management, and compliance applications, ensuring that internal standards are met with respect to the valuation component of these policies.

ASSET TYPES

- NORTH AMERICAN HIGH YIELD**  
7,300+ North American high yield corporate bonds
- EUROPEAN HIGH YIELD**  
2,700+ European high yield corporate bonds
- CREDIT DEFAULTS SWAPS**  
300,000+ CDS covering 6,200+ reference entities
- GLOBAL**  
9,300+ global bonds from Europe, Japan, Australia and New Zealand
- EQUITIES**  
Coverage of global equity markets included at no cost
- TRACE™**  
Real-time pricing disseminated by FINRA TRACE™ covering approximately 39,600 securities
- BDC**  
300,000+ historical BDC fair values assessments on senior secured, subordinated debt, equity and structured products investments dating back to 2000
- MUNICIPAL BONDS**  
1 Million active securities

- NORTH AMERICAN INVESTMENT GRADE**  
21,000+ North American investment grade corporate bonds
- EUROPEAN INVESTMENT GRADE**  
33,600+ European investment grade corporate bonds
- EMERGING MARKETS**  
48,700+ corporate and sovereign emerging markets bonds
- CONVERTIBLE**  
3,700+ U.S. domestic and international convertible corporate bonds
- OLD BONDS**  
453,000+ expired, called and matured bonds across all products
- MIDDLE MARKET LOANS**  
5,000+ current middle market cross-asset investments including daily pricing and middle market benchmarks
- SYNDICATED LOANS**  
19,000+ global broadly syndicated loans dating back to 2011 — loan data is aggregated from over 600 sources
- PRIVATE PLACEMENTS**  
Evaluated pricing on just about any credit security — even direct, bespoke, and highly illiquid instruments



PRODUCTS	Best Credit Data	Bloomberg	ICE	Markit	Refinitiv
Loans	✓	✓	✓	✓	✓
Corporate Bonds	✓	✓	✓	✓	✓
Municipal Bonds	✓	✓	✓	✓	✓
Private Placements	✓	✗	✗	✗	✗
Business Development Corporations / Middle Market Loans	✓	✗	✗	✗	✓

Best Credit Data vs Competitors

Best Credit Data was founded on the principle of using the best Big Data technology and resources available to create the best and most transparent evaluated pricing source for the Corporate and Municipal Bond Markets. We use one of the world's largest high performance cloud based data analytics platforms, designed specifically for large-scale big data analysis. On this platform, we are able to calculate more analytics per minute than most firms can do in days. In terms of evaluated pricing, this leads to better, faster and more accurate pricing. In terms of bond analytics, this leads to faster and less expensive calculations, which translates to real savings for the client. We are using the next generation of computation technology, which means that every day our computational power increases.

- Coverage**  
Coverage is the one of the most important issues when it comes to evaluated pricing. In a head to head test by a leading fund administrator, BCD had the best coverage relative to all its competitors. BCD has the unique ability to price not only the full active universe of Municipal Bonds, Corporate Bonds and Syndicated Loans, but also esoteric private securities covered by no other vendor.  
**Municipal Bonds** - 1 million bonds  
**Corporate Bonds** - 100,000+ bonds  
**Syndicated & Middle Market Loans** - 8,500+ loans  
**Direct Lending & Private Placements** - All securities can be evaluated by BCD

**Quality**  
Best Credit Data combines new technology with industry standard evaluation methodology to produce the best possible evaluation. Leveraging Google BigQuery allows BCD to incorporate data from hundreds of different sources seamlessly into the engine at our evaluation team's fingertips. While Best Credit stringently follows valuation best practices, we similarly look to press the industry forward using data and machine learning technology.

**Timeliness**  
Serving both buy and sell-side clients globally, BCD provides evaluations, analytics and web-based tools to some of the world's largest financial institutions. Best Credit Data is a technology leader that was a first adopter of cloud computing and machine learning in the evaluated pricing space.

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# Bloomberg

**Drive enterprise workflows with credible, transparent prices across a broad spectrum of financial instruments. Bloomberg's evaluated pricing service, BVAL, offers high-quality valuations using credible market sources and industry-leading analytics.**

Meaningful transparency is critical. Regulations require more detailed disclosures and stricter risk measurement. With unmatched transparency into observed market levels and relative value methodologies, Bloomberg delivers a powerful and objective solution for defensible pricing to mutual funds, money managers, hedge funds, auditors and regulators.

## **Bloomberg Valuation Service (BVAL)**

Out of the millions of securities that exist, most are thinly traded and difficult to price. Traditionally, a few broker quotes were sufficient to justify value. Bloomberg understands the need to increase rigor and transparency when establishing fair and independent asset evaluations. BVAL draws on contributed market data from thousands of sources. These broad observations, together with innovative analytics and high-quality data, produce objective third-party price valuations for fixed-income asset classes and derivative securities.

BVAL's benefits go beyond traditional asset evaluation services. All BVAL evaluated securities receive a BVAL Score, a proprietary measure on a scale of 1-10 of the amount and consistency of the market inputs used to calculate each price.

## **Coverage includes:**

### **• BVAL Fixed Income**

- 170,000+ government, supranational, agency and corporate (GSAC) bonds
- 1,000,000 municipal bonds
- 1,230,000 mortgage bonds
- Valuations include the BVAL score

### **• BVAL Derivatives**

- OTC derivatives
- Structured notes

Most important, BVAL delivers extensive value across the enterprise. Available via the Bloomberg Professional (R) service, BVAL delivers consistent data throughout the front, middle and back office. You know Bloomberg for high-quality data, cutting-edge technology and outstanding 24/7 service. These three elements combine to make BVAL the clear choice for evaluated pricing.

## **Real Pricing from Real Industry Experts**

BVAL was developed by a team of seasoned industry experts with hundreds of years of collective experience in trading, fund management, compliance and risk management, and pricing. Our team has worked on the client side and for other pricing services, so they know firsthand how regulatory changes, volatility and other factors affect your ability to evaluate positions effectively.

# SPOT ON

## **Data-driven muni pricing with BVAL changes the game.**

Bloomberg Valuation Service (BVAL) enables fund managers to meet fiduciary obligations with accurate, highly defensible muni bond pricing. Derived from highest-quality Bloomberg market data and driven by a radically improved pricing curve methodology, BVAL delivers muni valuations you can count on.

## **Learn More**

**BVLI <GO>**

**[bloomberg.com/BVAL](http://bloomberg.com/BVAL)**

BVAL does not express an opinion on the future value of a security and does not provide recommendations to "buy", "sell", "hold", or enter into any transaction or other strategy. No aspect of the BVAL valuation or data is based on a customer's individual circumstances. BVAL should not be considered as information sufficient upon which to base an investment decision. BVAL is offered where the necessary legal clearances have been obtained. Employees involved in BVAL may hold positions in securities included in the BVAL Services.

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FOR ENTERPRISE

# BONDVIEW

**BondView turns raw data into valuable information to promote smart investment decisions about municipal bonds. BondView is a multi-purpose product used by institutions, financial advisors, compliance, issuers and many retail investors. Key features for institutional users include:**

**X-Ray bond fund holdings:** Xray, Analyze & Monitor all 2400 municipal Bond Funds fast.

We leverage CUSIP level data to spot key daily trends for each municipal bond fund including: 1) Stress Testing at the CUSIP level for each fund, 2) Filtered holdings by issuer, state, sector, etc. 3) Advanced insight into fund trading strategies by each bond traded, 4) Locate which funds own the same or similar bonds to your target bond 5) Upcoming Maturity schedules on fund holdings, 5) Alerts for all fund portfolio changes, 6) Peer group analysis 7) Holdings diversification and projected monthly income. All of the above is also available for 1000's of managed public portfolios and even retail portfolios.

**Pre-trade analytics:** Know the Market Before You Trade

Utilizing our proprietary and back-tested pricing algorithms, BondView's Pre-Trade Analytics engine internally generates real time pricing on over 1.1mm municipal bonds. BondView's pricing is used daily by 10,000+ organizations. We provide context including rich or cheap analysis to support your pricing decisions. All data is available in report form which can be sent to a client or kept for your records.

**Liquidity assessment:** Know your Liquidity Funnel in Real-Time

Regulatory rules require fund managers, their boards and compliance teams to understand liquidity for each portfolio they manage. BondView's Liquidity Assessor provides a constant monitor of your holdings so that you can comply and report on fund liquidity while not building out expensive infrastructure and policy. (Coming soon)

**BondView compliance:** Monitor Your Trading Activity To Ensure Compliance

BondView Compliance assists desk Supervisors and Compliance staff in ensuring adherence to internal policies and procedure around best execution. Our tool set checks prices, performs mark up/mark down analysis and flags trades that are out of market.

## BondView 500 Index

The muni industry's first index based on actively traded, widely held bonds. The Bondview 500 is based on a robust methodology and follows IOSCO principles for index providers. It's transparent, consistent, and reliable. Bondview 500 is an equal weight index, which helps keep the index diversified rather than skewed by biggest borrowers and distills 1.3M bonds into 500 that more accurately represent the currently active municipal bond market. Unlike other indices, Bondview 500 publishes all its index constituents and their characteristics, including evaluated pricing and detailed liquidity depth, which makes it easy for index providers to source reliable market prices for constituents.

# Muni Bonds from a New View



## MUNICIPAL BONDS FROM A NEW VIEW

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- Access high net worth reports
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**BondView, LLC**  
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t: 1-866-261-9533  
e: support@BondView.com

# BONDVIEW



## SPECIALIST FIXED INCOME VALUATION SERVICES

**Corvid Partners is a leading valuations firm specialising in the most illiquid areas of fixed income securities. The firm provides evaluated pricing on a wide range of illiquid and structured fixed income securities. Managed by teams of experienced illiquid credit traders and structurers, our valuations currently provide a transparent and unbiased view of over 200 industry groups across more than 20 different debt market sectors.**

### EVALUATED PRICING FOR CAPITAL MARKETS

Demands for increased transparency from regulators and investors has created a need for skilled, independent, third party pricing across all asset classes. This becomes increasingly challenging as complexity increases and liquidity drops. For assets that rarely, if ever, trade in any size, market data may not exist at all. It is at this end of the liquidity spectrum that institutions come to Corvid Partners in order to provide robust, logical evaluated pricing.

### CORVID VALUATION SERVICE

Corvid offers consistent, independent pricing which provide robust, defensible pricing for even the most illiquid assets.

- We use a market price approach to pricing. This includes accounting for market risk appetite, underlying market liquidity and other assumptions around time to execution and trade size.
- We draw on an extensive database of market data gathered from multiple sources. This is used to evaluate both the securities being valued and the nature of the underlying market environment.
- Our pricing processes are continuously updated to account for changes at the broader market and individual security levels.

### CORVID EVALUATED PRICING

Corvid provides pricing on over 14,000 of the most illiquid fixed income securities. This covers over 200 industry sub groups across 65 countries. Our internal pricing models use over 500 market credit curves and we provide valuations in 22 different currencies.

- Corvid's services range from delivering valuation only data to providing detailed breakdowns of pricing models, required market assumptions and other data inputs.
- Pricing is typically provided on a daily or weekly basis but can also be structured to deliver data as required by each client.
- Pricing is based on bid side evaluations under normal market conditions but can also be provided as mid or offer levels as necessary.
- Valuations take into account elements such as trade size, minimum and maximum time to execution and other deal specific information that effects market liquidity and investor appetite.
- Our teams in Europe and North America are available year-round to discuss pricing assumptions and to field all pricing challenges across our market universe.

### WORKING WITH CLIENTS

Corvid's clients include some of the world's largest investment banks, pension funds, government agencies and market data providers. Every client has different requirements and Corvid works closely with each one with a view to building long-term relationships. That process involves better understanding regulatory burdens, building bespoke pricing models and ensuring that our pricing data is always compatible with third party systems and infrastructure.

For more information on our pricing and valuations services, please contact us.

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# Corvid Bond Valuations

Experience and Independence  
valuing illiquid and complex  
fixed income securities



[www.corvidpartners.com](http://www.corvidpartners.com)



**DelphX is dedicated to powering informed and highly liquid bond markets. Through our suite of price-discovery utilities, we deliver accurate pre-trade pricing and facilitate transparent communication among dealers and all other market participants. Offerings include validated and continuously-updating market-price forecasts through MAV=n, and a broad array of executable multi-dealer quotations through the QuotePx communication network.**

#### MAV=n® Reference Pricing

DelphX continuously calculates, validates and publishes in real-time, quarter-hour and EOD formats the current market-price forecast of most corporate bond issues, including those that rarely trade, via our proprietary MAV=n (Market-Adjusted Value per congruent nexus) technology. Complete post-trade OTC transaction data and the pre-trade pricing of all dealer quotations posted to QuotePx are incorporated into the evaluation process.

MAV=n coverage will soon be expanded to provide validated pre-trade pricing forecasts for ABS/MBS, municipals and other fixed income instruments.

The historical accuracy of each MAV=n pricing forecast is also continuously monitored and reported as its Accuracy “Score” to reflect the degree to which the security’s MAV=n pricing has accurately forecast the price at which the issue would trade in each of its five most recent transactions.

The complete history of all trades of each security, and the details of the MAV=n pricing current at the time of each trade, are also transparently displayed in the security’s Market-Depth record. All data required to independently audit every MAV=n price and Score is also displayed in each security’s Market-Depth record to facilitate independent analysis and provide auditable proof of Best Execution.

#### QuotePx®

QuotePx is a global pre-trade communication network that streamlines the flow of fixed income quotation information between dealers and investors while not interfering with bilateral relationships that remain at the center of the OTC market.

Dealers can communicate tailored quotations to individual, selected or groups of customer and non-customer subscribers and other dealers, respond to customer and non-customer RFQs and employ the integrated “Quix” messaging functionality to seamlessly interact with all subscribers and other dealers.

Subscribers can view their own “private quote-board” and respond online to all Level 1 quotes, and the Level 2 quotes of dealers from whom they have secured such favored access, and communicate their Lit, Dark or Global RFQs to individual, selected or groups of dealers.

(NOTE: No subscriber-to-subscriber or all-to-all communication is accommodated within QuotePx)



**We believe in helping our clients make wiser decisions and avoid compliance penalties by providing scrubbed, accurate and actionable municipal data via solutions that offer a balance of quality, reliability, and price.**

We know our clients are concerned with data integrity and need “clean” data – and they’re not the “check the box” types when it comes to compliance.

#### Best Practice Solutions

Hundreds of thousands of muni dealers, advisors, and asset managers use our solutions to improve their workflow and reduce their risk, while maintaining auditable policies and practices that stand up to regulatory scrutiny. Each DPC DATA disclosure product offers best practices in a streamlined package.

DPC DATA products are integrated into trading and portfolio management applications, as well as available through corporate web portals and intranets.

Top-tier and regional dealers have integrated DPC DATA solutions into their proprietary applications in a matter of weeks.

#### Exacting Database Standards

At the center of DPC DATA disclosure solutions lies an obligor identity code system linking over 87,000 obligors to more than 4.8 million CUSIPs. Unlike other information providers’ issuer-based databases, this system uniquely enables us to accurately index CUSIPs to all historical secondary market filings for an obligor. Speaking of filings, we have them... and more.

Our indexing and tagging processes make it easy to access the most comprehensive collection of municipal documents available.

Our industry-leading product delivery infrastructure supports nearly 1.2 million Material Event Notices, 780,000 Financials, and over 300,000 Official Statements. Since 2011, our database also contains over 600,000 obligor-relevant news articles licensed from hundreds of local and regional publications.

#### Industry Leading Products

##### **MuniTRADEVIEW**

End-to-end transaction review for Best Execution and G-18 compliance

##### **Filings Summary**

5-year lookbacks made easier with Filings Summary

##### **MuniDOCS Online**

Put officially filed disclosures at your fingertips

##### **MuniPOINTS**

Streamlined summaries of Official Statements provide quick access to issuer descriptions, use of proceeds and other salient facts

#### Relevant Research

A recent study from DPC DATA shows the timeliness of municipal financial disclosure filings has been improving, albeit to varying degrees depending on the sector.

Visit **DPCDATA.com/Resources** to access this timely research report.

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*Finalyse, a European-wide leading consultancy specialised in valuation, risk and performance solutions and regulatory compliance, provides the financial community with the expertise and creativity that bridges the gap between finance and technology. Our consultants combine the financial and technical know-how to deliver high value-added projects to our clients all over Europe. By working closely with our clients, we contribute to successful projects: the best guarantee for a long term relationship of trust.*

## Finalyse Valuation Services

In response to the regulatory incentive to have impartial expert valuation of complex derivatives and structured products, Finalyse launched in 2008 the **Finalyse Valuation Services (FVS)** to provide a transparent and **independent valuation and risk management** service. With FVS solution, we offer you

- State of the art pricing of **OTC Derivatives and Structured Products**, from vanilla to complex ones
- **Tailor-made** service, through specific financial models and ad-hoc reporting streams
- Periodic reports of **values and sensitivities** to help you identify the drivers of your portfolio's value
- Competitive prices combined with a cost-effective service **outsourcing**
- Certification ISAE3402 (SAS70)
- Fully **transparent** and auditable
- **Customizable reports** in terms of content, format and frequency
- Challenge margin calls, **collateral and unwind prices**
- Full support/**reconciliation with counterparty** prices
- **Fast reaction time** to any request from clients

### Finalyse Valuation Services as a 4-Pillars process:



**Do you want to test Finalyse Valuation Services and get a report for one of your own products for FREE?**

Just send us your termsheet at **info@finalyse.com** or call **+(352) 260 927**  
We take care of all the rest!

### Finalyse Valuation Services coverage by instrument type

- Range accruals
- Snowballs
- CMS Spread
- Target redemption notes
- Reverse floaters
- Callable structured products
- Hybrid structures: forex/commodities/equity/fixed income/index
- Lookbacks
- Knockouts
- Ratchets
- CPPI (stochastic rebalancing)
- Himalaya
- Credit derivatives
- ABS & RMBS: "illiquid products"
- *And much more...*

### Finalyse Valuation Services coverage by reporting needs

- Pricing and sensitivities
- Stress test
- Initial margin calculation
- Potential future exposure
- X-Value Adjustments (XVA)
- Collateral & disputes
- P&L explainer
- Value at risk
- Return distribution
- *And much more...*

### Finalyse for your EMIR reporting

An embedded or **Stand-alone EMIR**-compliant solution designed to facilitate EMIR reporting requirements through a well designed and straight-through automated process, providing you

- **Third-Party report to Trade Repository**
- Daily Transaction and Valuation Reports
- Daily Quality and TR Reports
- Delegation of intra-group transactions
- Back loading of historical transactions
- Easy implementation of outsourcing

Finalyse Valuation Services is tailor made to client needs. During the whole process, close interaction, proximity and full transparency guarantee that customers' needs are fully met. Prices from counterparties are analysed and compared on an ongoing basis in order to prevent and resolve pricing differences. When differences with counterparty's prices arise, Finalyse's team of financial experts with hands-on experience in quantitative analysis executes several controls with the aim of explaining them fully. Finalyse does not only provide prices but full analysis reports, stress tests, greeks, margin calculation and value at risk.

For more information scan the **QR code** or visit **www.finalyse.com/fvs**



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**FiNCAD is the leading provider of advanced analytics for pricing, valuation and risk. Our powerful, flexible, and high-performance solutions help over 1,000 global organizations enhance investment returns, manage risk, reduce costs, comply with regulations, and provide confidence to their investors and shareholders. Our comprehensive analytics cover all instruments and asset classes, including exotics and hybrids, and our platform can be customized to specific client workflows. Our clients include leading institutional asset managers, hedge funds, insurers, banks, corporations, auditors, and governments.**

An established leader and innovator with more than 20 years of experience, we are a trusted partner to our clients, providing deep market understanding, a client-centered business approach, and unmatched quantitative expertise.

Our pool of over 1,000 clients are the leading global asset managers, banks, hedge funds, and insurance companies, but there are still many firms around the world that can improve the ways in which they manage risk and make decisions in the front and middle office.

We enable our clients create competitive advantage through cost savings and enhanced investment returns. Reduced reliance on expensive quant resources, optimal deployment of capital, and ongoing support from our quantitative, industry, and software engineering expertise minimize the cost of business for our clients. Rapid, accurate and transparent valuation and risk analytics across organizational silos expose trading opportunities, validate trade pricing with industry-standard models, and ensure aggregated enterprise-wide risk is known.

# Pricing, Valuation and Risk Analytics



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# fite analytics



**Fite Analytics helps fixed income investors manage Risk and Return. Our platform, CMS:Portfolio, is powered by benchmarks from S&P Dow Jones Indices and extensive market content from Exchange Data International. Cloud-native with zero-implementation, CMS:Portfolio sets the standard for fixed income portfolio and security analytics.**

## For Asset Managers

Understand Risk & Return at the portfolio, asset-class, and security level, versus benchmarks or liabilities. Fully explain historical risk and performance with CMS:Portfolio, an industry-leading portfolio analytics platform designed to perform what-if analyses, conduct stress tests and yield curve scenarios, and shock all drivers of risk and return over different horizons.

- Track Your Portfolios
- Pre-Trade Analysis
- Portfolio Analytics
- Benchmark Comparisons
- Liability-Driven Investment Strategies
- Stress Testing
- Ladder Constructors
- Monitoring

## For Broker-Dealers

Provide insight into your clients' portfolios to optimize for risk and return. Generate analyses of price, yield, cash flow and market liquidity across any number of portfolios. Customize report books for your firm and publish them efficiently on-demand.

Leverage CMS:Portfolio as your firm's white label analytics and reporting framework. Enhance the value you bring your customers by offering industry-leading analytics at a reasonable cost.

- Easy Portfolio Import
- Research Service Bureau
- Pre-trade Analytics
- Portfolio Analytics
- S&P Dow Jones Index Explorer
- Rate Shocks
- White Label Client Reporting

## Products & Services

### Security & Portfolio APIs

Comprehensive, Lightweight, and Ultra-Fast

### Security & Portfolio Batch Analytics

Submit up to 5 million securities in a single batch. Comprehensive analytics returned in 90 minutes or less

### Client Reporting

Custom white label reports for your institutional clients

### Web & Mobile Applications

Rich applications and work-flows for monitoring, compliance and reporting

# fite analytics

- Global Coverage
- Street-Standard Analytics
- Fastest Computations
- API / Batch / BI Tools

## Fixed Income Analytics Platform

Understand Risk & Return at the portfolio, asset-class, and security level, versus benchmarks or liabilities. Fully explain historical risk and performance with CMS:Portfolio, an industry-leading portfolio analytics platform designed to perform what-if analyses, conduct stress tests and yield curve scenarios, and shock all drivers of risk and return over different horizons.

## Key Features

### Market Data

- Global Corporate, Government, Agency, Muni
- Global MBS, CLO, CDO, ABS, CMBS, LX
- Full Curve Sets

### Customer Data

- Excel/CSV workflows for import/export
- Easily import positions and/or transactions
- Model any private or public security

### Web Applications & Reports

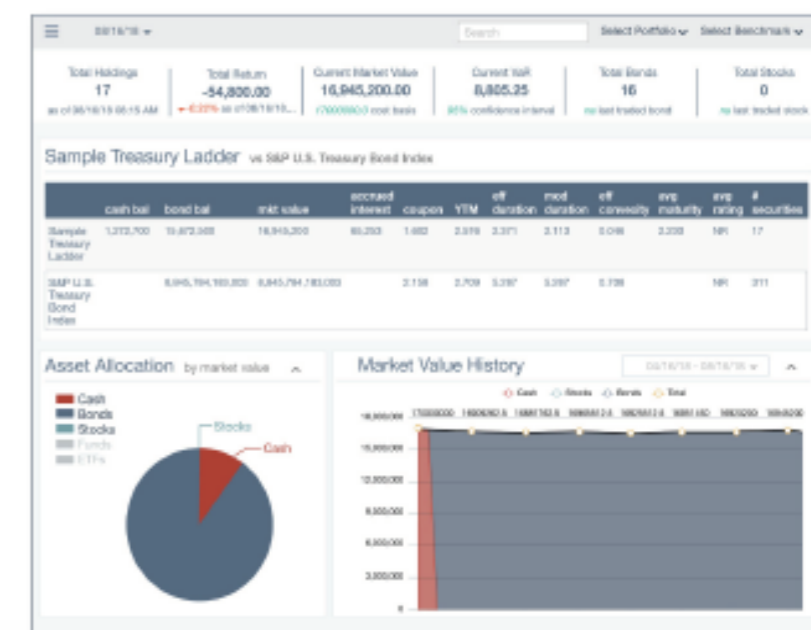
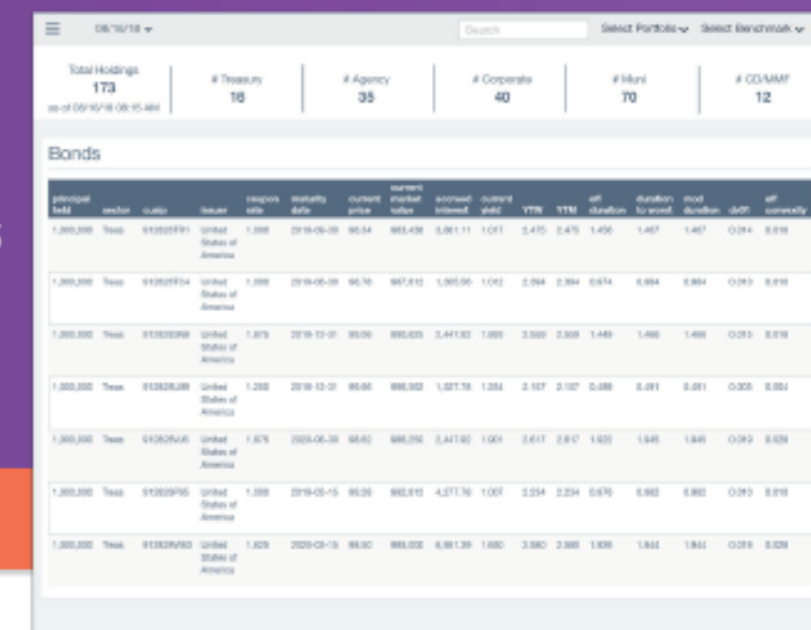
- Partnership with Google Looker
- Security tear sheets
- Portfolio-level reporting
- Custom white-label reports

### APIs & Data Feeds

- All content available as web or python APIs or customized data feeds

### Analytics

- Maintain any number of portfolios with any number & type of securities
- Extensive analytics for securities & portfolios
- Compare to benchmarks and/or liabilities



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**Intercontinental Exchange (NYSE: ICE) operates the leading network of global futures and equity exchanges and provides world class clearing, data and listing services across commodity and financial markets. The New York Stock Exchange is the world leader in capital raising and equities trading.**

Formed in 2000, ICE's electronic trading platform brought more transparency and accessibility to the OTC energy markets. Soon after, ICE added global futures and cleared OTC markets across virtually all asset classes, data services and clearing houses. With a culture of growth through client service and innovation, ICE's global network and state-of-the art technology solutions serve the dynamic needs of market participants around the world.

Today, the result is an ecosystem of 11 exchanges, 6 clearing houses as well as global data and listings services that combine to provide access to global capital and derivatives markets.

#### **ICE Data Services**

ICE Data Services offers a robust end-to-end solution for information, analytics and connectivity, with a range of proprietary data and tools for global markets across fixed income, equities, commodities, FX and options. From exclusive real-time data driven by 11 global exchanges, leading continuous fixed income evaluated pricing, reference data and analytics, to robust desktops, trading tools, and connectivity solutions, thousands of market participants around the world deploy our award-winning data services to inform their market and economic perspectives and decision-making.

#### **Pricing & Analytics**

The leading pricing, analytics and market data offered through ICE Data Services support mission-critical processes across the front,

middle and back offices of organizations around the world. With products such as our end-of-day evaluated pricing, continuous fixed income evaluated pricing, best execution services, and Liquidity Indicators, we're able to support intraday, real-time decision-making within financial organizations and help link strategic objectives with day-to-day actions. We deliver independent evaluations for approximately 2.7 million fixed income and international equity securities each day, including hard-to-value, thinly traded fixed income issues, provide trusted reference data for more than 10 million financial instruments, offer a low latency consolidated feed that connects hundreds of sources, publish leading market indices against which industry or security performance can be measured, and license for critical benchmarks like LIBOR and the LBMA Gold Price.

#### **Evaluated Pricing**

We deliver daily evaluations representing approximately 135 countries and over 50 different currencies for approximately 2.7 million financial instruments. As a proven industry leader in evaluated pricing, we help set the standard for coverage, high quality and reliable delivery.

Our teams of evaluators operating in the U.S., UK, Germany, Hong Kong and Australia serve both the buy- and sell-side; thousands of financial institutions worldwide, ranging from central banks to large investment banks, subscribe to our evaluations. Each daily independent evaluation represents our good faith opinion as to what a holder would receive in an orderly transaction for a security (typically in an institutional round lot position) under current market conditions. In addition to bid-side evaluations, we also offers mid/mean and ask-side evaluations.



## ESSENTIAL DATA FROM GLOBAL MARKETS

The leading pricing, analytics and reference data offered through ICE Data Services support mission-critical processes across the front, middle and back offices of organizations around the world.

[theice.com/data](http://theice.com/data)



#### **ICE Data Services**

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**IHS Markit (NYSE: INFO) provides high quality, independent pricing, reference and liquidity data across a wide range of fixed income and derivative asset classes, including market-leading credit default swaps (CDS) and loan franchises, plus CLOs and bonds in the municipal, corporate and global securitized sectors, including coverage of hard to value illiquid securities. Our data enables financial institutions to make informed decisions around trading, valuations and risk management.**

#### **High Quality, Independent Pricing Data**

Our sophisticated technology engine powers our data services. We built our innovative tools with an emphasis on transparent methodology and flexible delivery, alongside a team of leading fixed income experts who deliver unique cross-asset insight and customer support. Our offering includes detailed liquidity metrics and transparent information about pricing sources and methodologies, with flexible delivery options tailored to your needs.

#### **Flexible Data Delivery for Investment, Risk and Reporting**

Find flexible delivery options via flat file, API access, our Excel plug-in and the Price Viewer web portal. We also have extensive third-party relationships with global custodians and fund administrators, as well as integration via third-party platforms and systems.

#### **IHS Markit**

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**Kalotay Analytics has been at the core of the world's most sophisticated fixed income valuation systems for almost three decades. From intraday NAVs of bond ETFs to instantaneous MBS portfolio risk analysis, Kalotay's patented technology performs computationally intensive calculations with the precision and speed demanded by today's market participants.**

#### Technology

Kalotay Analytics seamlessly integrates into any internal client system, external cloud service, or vendor application. Kalotay's cross-platform C, C++, C#, Java and Python SDKs are ideal for interactive applications and high-volume computations.

#### Innovation

##### **MuniSignal – Tax Loss Harvesting**

- Patent-pending framework for maximizing after-tax performance
- Tracks holder's basis and accrued OID
- Calculates cashflow benefit of selling, using 'hold value' as reference point
- Signals when to sell, taking into account the value of the forfeited tax option

##### **CurviLinear – Yield Curve & Volatility Estimation**

- Constructs best-fit intraday yield curves from bond prices
- Optimizer simultaneously solves for interest rate volatility

#### Functionality

- Option-adjusted spread (OAS)
- Effective duration, convexity, DV01, key rate durations
- Stress testing and scenario analysis
- Conventional price/yields and accrued interest for various daycounts
- Modified duration, convexity, DV01

#### Coverage

##### **BondOAS – Fixed Rate Bonds**

Includes callable, puttable, sinking fund, amortizing, pay-in-kind, and step-up structures.

- Agencies
- Corporates
- Treasuries
- Sovereigns
- Foreign Corporates
- CDs

##### **MuniOAS – Fixed Rate Tax-Exempts**

Patent-pending 'tax-neutral' OAS valuation of tax-exempt municipal bonds, including callables and OIDs.

- Tax-neutral OAS, duration, convexity, etc.
- Converts callable muni curve to par optionless curve

##### **FloatVal – Floaters and Structured Notes**

- Vanilla
- Capped, Range & Inverse
- Range Accrual
- Pct. of Libor
- Flip Note
- Callable Zero

##### **TIPSVal – Inflation-Indexed Bonds**

- US TIPS
- Canadian RRB
- German Bund/BO
- Swedish
- Japanese
- Deflation Protection
- UK ILG
- French OATi/OAT€
- Italian BTP€
- Australian
- Fixed Coupon
- Inflation-adjusted Principal

##### **CLEANMBS – Mortgage-Backed Securities**

Patented recursive lattice-based valuation and prepayment modeling

- Agency pass-thrus
- Non-Agency pass-thrus (accommodating default and recovery rates)
- Interest-only (IOs)
- Principal-only (POs)

#### Kalotay Analytics

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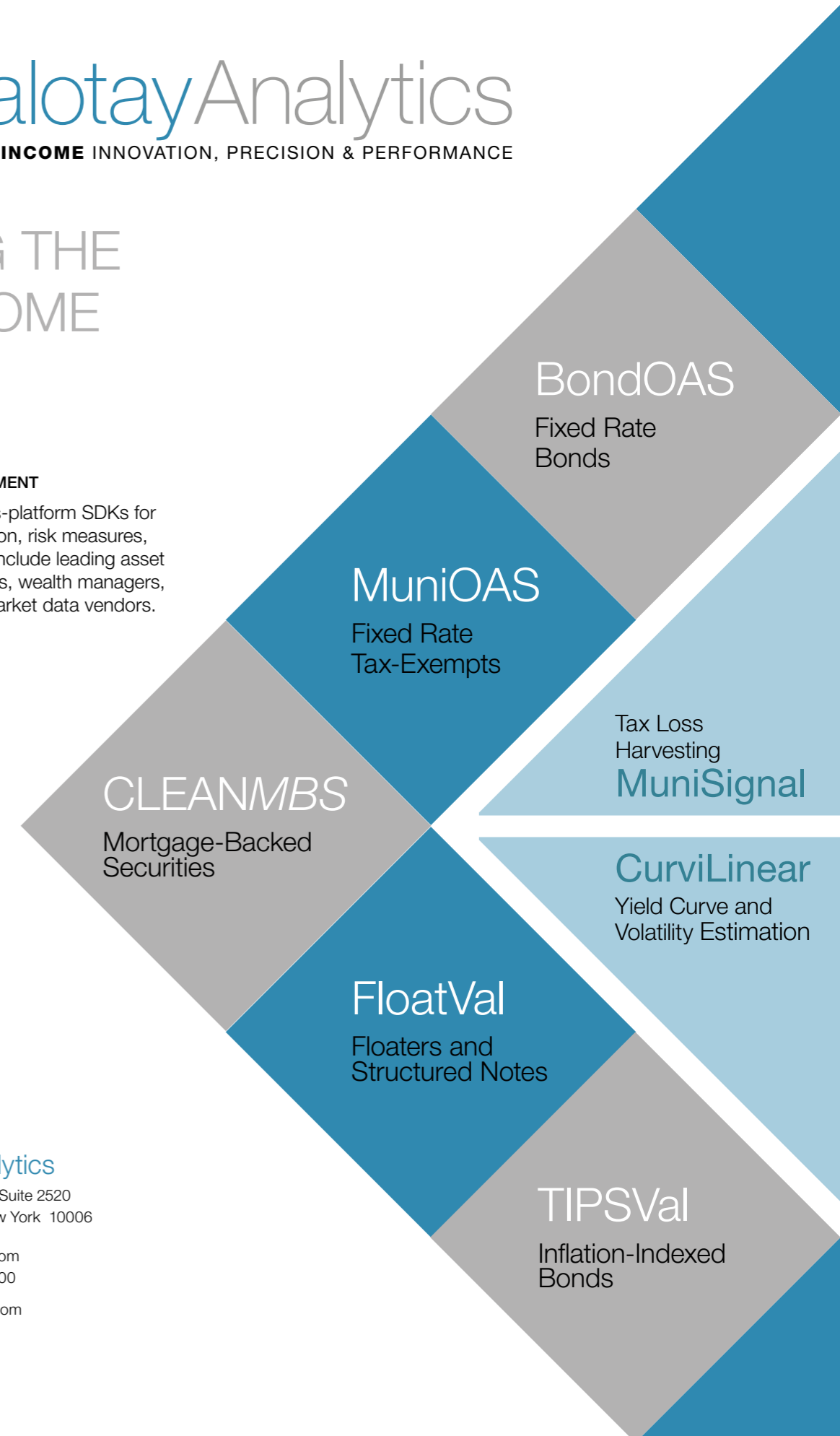
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## COVERING THE FIXED INCOME MARKETS

#### OAS-BASED ANALYTICS FOR VALUATION AND RISK MANAGEMENT

Kalotay Analytics delivers cross-platform SDKs for high-speed OAS-based valuation, risk measures, and scenario analysis. Clients include leading asset managers, institutional investors, wealth managers, traders, index providers and market data vendors.



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Moody's Analytics provides financial intelligence and analytical tools supporting our clients' growth, efficiency and risk management objectives. The combination of our unparalleled expertise in risk, expansive information resources, and innovative application of technology helps today's business leaders confidently navigate an evolving marketplace. We are recognized for our industry-leading solutions, comprising research, data, software and professional services, assembled to deliver a seamless customer experience. Thousands of organizations worldwide have made us their trusted partner because of our uncompromising commitment to quality, client service, and integrity.

Moody's Analytics provides users with comprehensive coverage and integrated capabilities across all Structured through investor tools and services, regulatory & risk solutions, advanced APIs, and enhanced data tools and feeds. Our solutions portfolio encompass all asset classes globally including CLOs, ABS, RMBS, and CMBS. The Moody's Analytics Structured Finance Portal consists of three modules: monitoring, cash flow analytics, and regulatory. The tool offers multi-level data, advanced comparative analytics and customizable benchmarks, empowering the investment decisions of our clients.

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# Dive Deep into the Data and Analytics You Need with the *Structured Finance Portal*

Our *cloud-based solution* sets a new standard for data transparency, analysis, and reporting across *all structured finance asset classes*.

It offers multi-level data, advanced comparative analytics and customizable benchmarks, *empowering the investment decisions* of our clients.

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MOODY'S  
ANALYTICS



# NORDIC BOND PRICING

**Nordic Bond Pricing was established by Nordic Trustee and the Norwegian Mutual Fund and Asset Management Association in 2013, and is an infrastructure company for the benefit of the participants in the bond market.**

## Our services

Nordic Bond Pricing provides a daily independent pricing service for bonds and has an objective to develop supplementary services as requested by our clients, including bond indices. The company has a systematic approach in obtaining market information, and develop models and analytical tools in order to achieve high quality of the services provided.

## Independent pricing service for bonds

Accessing market data from all of the major market participants in the Norwegian market, Nordic Bond Pricing has become the primary source of independent pricing data. However, quality is only achieved through dedicated and systematic work. With a team of experienced analysts, we have the knowledge and resources to supervise the markets. Market information collected is being processed through our financial models and systems in order to cleanse and verify data, and in turn to deliver the best estimate of market prices. With our local presence, we are close to the market participants in order to discuss market events and prerequisites for the evaluations.

Nordic Bond Pricing is the preferred provider of independent pricing for Norwegian bonds towards the professional buy-side community, and has a coverage that is unrivalled.

## Availability

Nordic Bond Pricing is offering end-of day delivery of data-files, facilitated for automatic import to portfolio management systems. Please contact us for further details at [info@nordicbondpricing.no](mailto:info@nordicbondpricing.no)

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# PricingDirect

by J.P.Morgan

**PricingDirect delivers independent, reliable valuations and analytics services across 40 fixed income and derivative asset classes worldwide. Thousands of firms benefit from the comprehensive, real-time, and transparent information we deliver.**

## Independent market intelligence

Since 2002, we have been providing accurate, independent, and unbiased valuations to clients worldwide. We leverage real-time market intelligence from numerous sources including buy-side and sell-side market participants, the J.P. Morgan trading desks, and third-party distributors.

As the regulatory landscape continues to evolve, PricingDirect is the only pricing service to have maintained an annual SSAE 18/ISAE 3402 Type II certification for all products and services since 2005.

## Track record of precision

PricingDirect has been a trusted source of fixed income and derivative evaluations for over 15 years, through periods of market volatility and uncertainty. The accuracy of our prices is driven by our experienced evaluation team, which utilizes robust processes to generate mark-to-market prices.

Our evaluations are derived from primary and secondary trading insights, market-tested J.P. Morgan models, analytics and individual evaluator expertise.

We have the unique ability to obtain market color directly from the J.P. Morgan trading desk and integrate real-time market insights into our pricing framework.

As a part of one of the largest broker-dealers in the world, we have robust and in-depth access to the market and leverage this access to enhance the relevance and validity of our prices.

## Market leading client experience, supported by dedicated expertise

PricingDirect provides valuations to 90% of the top 50 mutual funds and 80% of the top 20 banks by AUM.

Our highly skilled team is committed to providing you with a complete first-class client experience. At least two PricingDirect evaluators will be assigned as your primary points of contact and, along with your dedicated sales professional, will be responsible for addressing all of your inquiries.

Our technology team will tailor our innovative platform to your technical requirements to ensure a seamless delivery process. With offices in New York, Boston, London, Mumbai, and Hong Kong, our teams offer around-the-clock service and support.

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DERIVATIVE PRICING BACKED BY TRANSACTION EVIDENCE

**Rate Validation Services is the leading independent provider of derivative pricing services for the OTC Global Derivative Markets.**

RVS has pioneered the use of Transaction Evidence to Back Test Consensus+ information, combined with a market leading approach to governance, in the creation and calculation of financial rate sets, benchmarks, indices and surfaces.

Accuracy and transparency are key to ensuring the integrity of calculations.

RVS utilises transaction evidence in accordance with the latest industry recommendations (IOSCO Principles for Financial Benchmarks) and to satisfy legislation, such as PruVal, FRTB and MiFIDII.

The RVS Consensus+ Services cover all OTC products, increase Banks' capital efficiency, improve Banks' risk and valuation management processes and reduce the risk of manipulation and malpractice.

RVS was founded in 2009 (RVS has operations in Asia, Europe and Australia) to improve the ability of Global Banks to support their book valuations of illiquid assets and liabilities, following the Global Financial Crisis.

In a world of complex and opaque financial products, RVS delivers transparency and accuracy to the valuation and validation process.

## RVS CONSENSUS+ DERIVATIVE PRICING SERVICE



**Agile – Accurate – Advanced – Secure**

We are the leading independent provider of derivative pricing services for the Global OTC Derivative Markets.

- Our unique use of **Trade Evidence**, which when combined with our market leading approach to governance, ensures the integrity and **accuracy of the daily mark to market process**.

RVS CONSENSUS+ TRADE EVIDENCE				
COMMODITY DERIVATIVES	CREDIT DERIVATIVES	EQUITY DERIVATIVES	FX DERIVATIVES	INTEREST RATE DERIVATIVES

**FACILITATES REGULATORY REPORTING  
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Scanrate provides insights, knowhow and software solutions for the Danish mortgage bond market.

**The Danish mortgage bond market is one of the oldest, largest and most robust fixed income markets in the world. It has survived several occasions of economic and political turmoil, including the latest global financial crisis, with no disruptions to issuance activity or market confidence.**

#### Background

For more than twenty-five years, Scanrate has developed the benchmarks models used to assess risk and returns on Danish MBS.

Scanrate was first to introduce an MBS modelling framework based on lattice models and backward induction. Prepayment models are behavioral models taking borrower composition and historical prepayment practices into account. The models are widely used by large investors and market makers in the Danish market.

#### Offerings

##### Software libraries

Software offerings include the advanced fixed income library RIO with a range of proprietary models for calculating risk and return, scenario analysis and performance attribution. The library has an intuitive Microsoft Excel interface and full support for Microsoft.Net.

##### Prepayment modelling service

Quarterly prepayment modelling service based on updated data from the mortgage credit institutions. Keep up with the Danish MBS market by reading the quarterly report.

##### ASP solutions

Scanrate provides complete ASP solutions for fixed income analysis with daily updates to data and models done by an experienced team of analysts.

##### Scanrate pricing service

Scanrate provides an evaluated pricing service for Danish bonds. The service is used for collateral management and capital requirement reporting by a large number of Danish banks

##### Distributor of bond basic data

Scanrate is a redistributor of Danish bond basic data and market quotes. Added-value data are collected from prospectuses and issuer news feeds. Scanrate holds one of the most complete historical databases on Danish MBS activity.

##### Client specific services

Scanrate offers customized services for Danish MBS investors. Examples are valuation and risk reporting based on client specified curves, value-at-risk analysis, performance attribution and liquidity forecasts. Please contact us with your specific needs.

##### Integration services to third party systems

Scanrate has broad experience in building interfaces to third party portfolio management systems.

##### Clients

Clients includes major commercial banks, global data vendors, pension funds and central banks.

##### Consultancy

As a leading independent bond market expert, Scanrate is frequently employed as a consultant on product development and new legislation.

#### Svend Jakobsen

Partner, CEO, Ph.d.

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**Since 2001, Securities Quote Xchange ("SQX") has specialized in gathering and distributing difficult-to-price security quotes for the investment industry.**

SQX offers a web-based solution that allows downloading of end-of-day price quotes for structured notes, and streams them directly into the firm's back-office systems via Excel or SFTP. SQX currently maintains a relationship with over 200 domestic and foreign dealers, who provide clients with pricing data on fixed income instruments through SQX.

Beginning in 2015, SQX now offers daily end-of-day fixed-income evaluations. In the fall of 2016, SQX teamed up with Mergent, allowing for an even broader range of fixed-income price evaluations using Mergent data, such as municipal bond pricing.

#### **Structured-Note Broker Quotes**

##### *Overview*

SQX is one of a handful of firms that specializes in gathering and distributing end-of-day structured-note, broker-quoted prices. We currently maintain a relationship with over 100 domestic and foreign dealers, providing the widest array of structured-note security pricing available.

##### *Features*

**Comprehensive:** Covers all major US and European issuers

**Customizable:** Parsed and formatted according to your firm's specifications

**Comprehensive:** SQX has the broadest coverage in the market

**Cost-effective:** Save time and \$ by letting SQX manage the process

#### *Highlights*

- Daily, weekly, or monthly dealer updates
- Daily pricing for 50,000+ broker quotes
- 20+ years of providing broker-quoted prices

#### *Quality Data You Can Trust*

- Data sourced from SQX
- Data is updated at 5:30 PM EST for the current day's data
- SQX has served multiple, large industry-leading clients for decades

#### **Fixed Income Evaluations**

We combine market and security information with our proprietary model and term structure, for accurate and transparent price evaluations. Our algorithms reduce risk by providing more precise evaluations than traditional methods (such as bootstrapping, interpolation and matrix pricing).

#### **Municipal Bond Pricing**

SQX offers a municipal bond pricing service developed for the middle-market, regional dealer community and their clients which

- offers transparency into the methods and data sourced to produce the valuations
- gives client partners the ability to provide needed feedback during development phases
- is developed by experts specific to the market niche it serves
- is priced to fit the regional firms' budgetary framework



**Trust SQX for your global, fixed-income pricing needs.**

We provide a broad range of accurate, cost-effective prices for structured notes, evaluated corporate bonds, and municipal bonds.

**Accurate** – Reliable and rigorous methodology

**Cost Effective** – Industry's low-cost pricing leader

**Independent** – Third-party pricing and audit reports for over 15 years

**Customized** – Service and pricing determined by client-specific needs

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**Data is the lifeblood of financial organisations today – but high quality, financial data comes at a cost.**

**Imagine if you could purchase the data you actually needed instead of wading through unnecessary information, in cumbersome data packages that are excessively priced?**

Volatility in today's markets and the inevitable shift away from benchmarks like LIBOR has shown that access to the highest quality data is vital. Large, expensive and unwieldy packages of data are no longer suitable or in line with today's data consumption models – your business needs data packages that are flexible, tailored to your needs, and offer value for money.

Tradition is one of the world's largest interdealer brokers in OTC financial and commodity products represented in 29 countries. Our real-time, intra-day, end-of-day and historical pricing originates directly from our successful global brokerage business – Our coverage means we can penetrate illiquid markets to provide hard-to-find prices in developing products and regions with the granularity and detail you need.

TraditionDATA has designed its financial data packages to save you time and money. By providing your business units with the focussed information they need, we help you make the right trading decisions, improving efficiency, increasing profit and mitigating risk.

As market leaders in our field in many OTC Derivative Products, TraditionDATA provides consistent, high-quality financial market data that reflects indications of institutional size live tradable prices in global OTC markets covering: FX & Money Markets, Interest Rate Swaps, Energy & Commodities, Credit & Fixed Income and other derivatives.

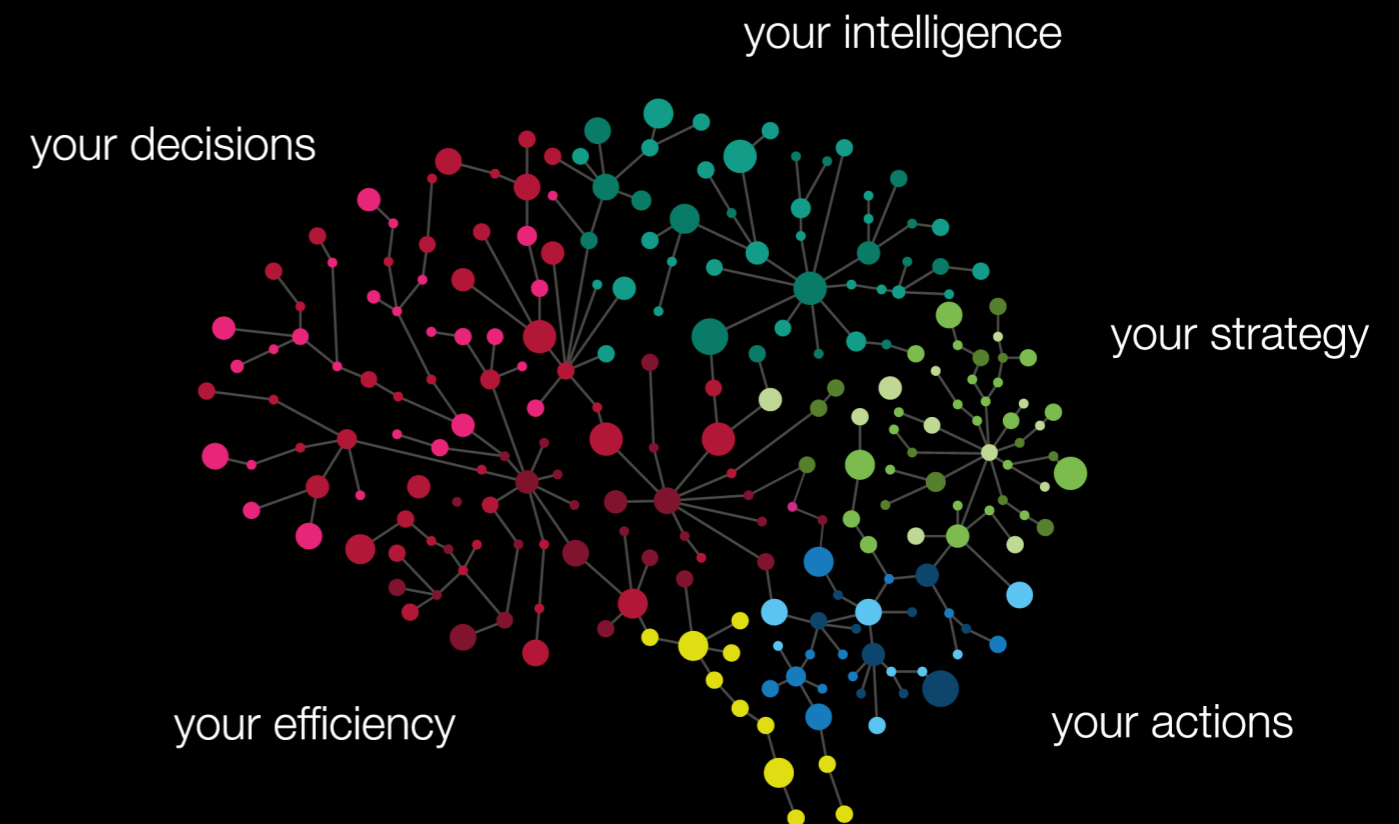
Whatever the asset class, product, or region, we are always 'ON' with accurate, independent pricing data sourced from the heart of the global financial markets.

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