



FIS MONIS

TURN DATA INTO INSIGHTS WITH INNOVATIVE TECHNOLOGY FOR CONVERTIBLE BONDS



Business overview

Reaping the rewards of successful investing in convertible bonds is dependent upon a sophisticated analysis throughout the instruments' lifecycle. In today's fast-moving and challenging markets maximum potential is realised by firms who can master deep insight into the complexities and risks of the convertible bond rapidly and accurately.

In capital markets investment banks and trading institutions must provide issuers with effective marketing and distribution channels to investors. Support for rapid, competitive deal pricing can ensure strong demand underpinned by historic and current market analysis. The highly complex, data intensive nature of convertible bonds as an asset class, complicates market making, position keeping and risk management. As market volumes continue to rise globally, firms are under pressure to source and collate timely, accurate and reliable sources of terms and conditions data.

On the buy-side, investors; asset managers, hedge funds, pension funds, research and advisory firms, need efficient pricing mechanisms with a robust, transparent approach to tracking ideas, orders and trades – and identifying opportunities and anomalies.

In order to make informed decisions, investors need accurate, timely bond pricing with a clear view of their existing and potential exposure to convertible bonds and other equity-linked instruments. Fund managers must model and analyze the impact of multiple market variables such as equity, default risk and interest rates, on both individual bonds and the total portfolio. Consequently, access to powerful, specialized tools is an imperative for effective convertible bond trading, convertible arbitrage and portfolio management.

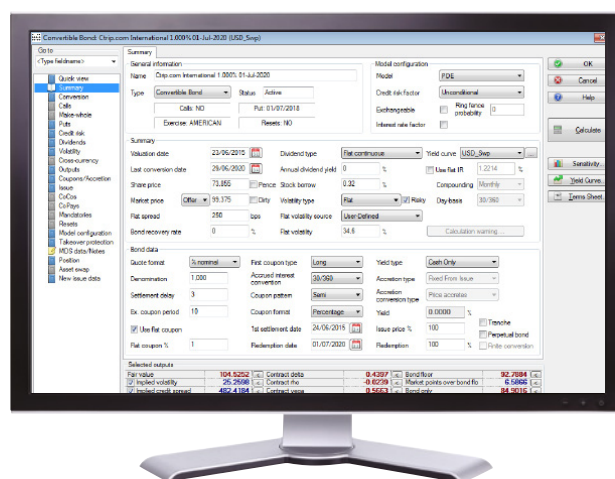
The regulatory, risk and reporting requirements incumbent upon all market participants make the management of these challenges harder. To avoid increasing overheads, firms urgently need integrated, highly automated solutions to support and execute the convertible bond workflow from end-to-end, while increasing speed and efficiency throughout.

FIS can help

FIS' Monis suite of solutions has long provided powerful modeling, analytical and pricing capabilities, supported by high quality, accurate terms and conditions and market data, for a full range of complex convertible bonds and equity-linked securities.

Monis solutions for the analysis and pricing of complex securities range from both packaged and customizable spreadsheet-based applications to powerful, multi-user, server-based systems with databases. To support flexible working arrangements a portable tool, Monis Mobile allows buy- and sell-side users to keep in touch with new issuance of convertible bonds while on the move. In addition to standalone solutions with their own interface, Monis offers a range of integration and plug-in options, providing access to its libraries and functionality through other systems and applications.

Intuitive user interface



Now, as a means to adapt to new challenges and growing market requirements, Monis can also be fully integrated with FIS' market leading trading, real-time position keeping, portfolio and risk management solution – Front Arena. The resulting combination, Monis-Front Arena, helps sell-side and buy-side firms, risk managers, advisors and researchers manage the complete life cycle of convertible bonds, from sales trading and convertible arbitrage to portfolio management.

SOLUTIONS TO SUIT YOUR REQUIREMENTS

The Monis suite can scale up to suit all levels of complexity and sophistication. Its solutions range from spreadsheet based applications for convertible analysis and pricing, to powerful and robust systems for scenario and risk analysis for convertible bonds and other complex securities.

Monis Analyzer XL

Monis Analyzer XL extends the sophistication of the core Analyzer functionality to allow users the full flexibility of MS Excel. It not only provides a complete spreadsheet based pricing, analysis and hedging solution for convertible bonds, it can also be tailored to individual needs, meeting any number of specialist requirements.

Suitable for pricing and risk analysis, Monis Analyzer XL provides sophisticated analytics and flexible models, for powerful sensitivity analysis, and supports real-time recalculation of outputs and positions. It features a flexible spreadsheet interface, with no restrictions on layout, and links directly to either local database, central server database allowing terms and conditions data sharing by multiple client spreadsheets, or to a spreadsheet repository. Local options offer simple and rapid deployment.

Monis Analyzer

Monis Analyzer provides powerful analysis, modeling, pricing and hedging capabilities for convertible bonds, and is designed to provide the industry level risk and scenario analysis required for complex derivatives. It delivers a complete portfolio overview, supports secure, multi-user analysis and enables the evaluation of different trading strategies and the management of risk across all trading books.

With sophisticated analytical capabilities for convertible modeling, Monis Analyzer can be used to compare risk for different portfolios and assess their performance against user-defined benchmarks. Delta and other market risks such as Rho and Credit01 can be combined and averaged according to weight, portfolio, sector and position. In addition to traditional convertibles, preferred securities and PEPs, the solution supports the pricing of a range of asset classes such as convertible asset swaps, straight bonds, interest rate swaps, options, equities, bond futures and credit default swaps, which may form part of convertible arbitrage and long-only strategies.

Monis Data Service

Supporting Monis XL and Monis Analyzer, Monis Data Service delivers high quality, accurate terms and conditions and market data, as and when required, for more than 1,200 convertibles worldwide. Researched by convertible market experts, the solution provides timely updates as a web service, formatted for rapid integration into the Monis analytic environment. This eliminates the work associated with collating and maintaining high quality data: a critical component of convertible analysis, pricing and hedging strategies.

The Monis Data Service collates data on convertibles and new issues from a wide variety of market data sources. The primary source for terms and conditions data is the original documentation; term sheets, indentures and prospectuses where available. It also provides a full set of end-of-day market data for pricing, including underlying equity prices, dividend yield forecasts, convertibles market prices, foreign exchange and historical volatility, allowing for an immediate indication of pricing as the basis for more sophisticated analysis.

Monis has recently been collaborating with other data generators and suppliers within FIS and now provides data on Astec Borrow and Stock Loan as well as reference points from FastVal Volatility Surfaces.

Monis Mobile

Monis Mobile is an app available for all clients of the Monis Data Service for use on both Android and iOS based devices. It will help keep clients informed of new issue announcements when away from their desk. Push notifications alert users to the availability of a new issue in the Monis Data Service as well as any updates, such as re-pricing or final terms. Opening the app gives a list of new convertible bond issues for the past month, each of which can be examined to give the key details of issue size, lead managers, maturity, coupon/yield range, new issue conversion premium range and the key features of the bond. A valuation matrix for the best-to-worst coupon/yield and conversion premium allows users to view the range in valuation for each of the main calculated outputs of fair value, implied volatility, delta, gamma and bond floor. The key input assumptions used in the valuation may be selected from the range of values available for credit spread and volatility.

The intuitive 'fingerprint' chart provides the expected fair value, parity and bond floor for a range of underlying share price, assuming pricing at the mids. The bond offer price is super-imposed on this chart to give users a clear indication whether the issue is currently valued appropriately or whether trading opportunities exist for the selected issue.

Integration options: alternative ways to access Monis XL

As well as being deployed with its own user interface, Monis XL's functionality can be integrated and accessed at three additional levels.

Gain direct access to analytics libraries

Monis XL's analytics libraries can be integrated directly with, and accessed via, your internal systems as a self-contained solution, in the form of C++ and dynamic link library (DLL) files. At this level the libraries are compatible with Microsoft Windows and the Oracle Solaris operating system.

Integrate with third-party applications via ActiveX

Use Monis XL's ActiveX components to integrate the solution directly with third-party applications on Windows. This enables you to create, display and price all the instrument types that Monis supports through an alternative, ActiveX compatible solution. Additionally, through our Object Serializer component, save and load Monis ActiveX objects to and from XML files – or load ActiveX instruments directly from Monis Data Service XML files.

Add a spreadsheet API

Available in combination with Monis XL, this plug-in version is loaded by default when you start up the main solution – allowing you to automate common spreadsheet operations, such as importing data or create new instruments. Use the API to create customized reports and transfer instrument data from external sources to spreadsheets.

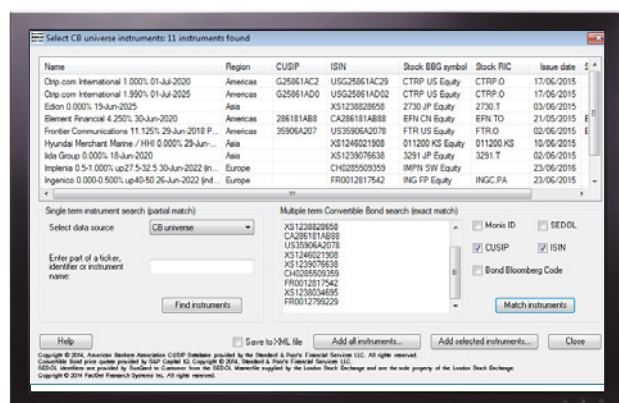
The full integration story: introducing Monis-Front Arena

For Monis users, FIS now offers the option of a smooth migration path to our Front Arena trading, real-time position keeping, portfolio and risk management solution. The resulting Monis-Front Arena solution enables firms to benefit from high quality terms and conditions data on convertibles, and also comprehensive workflow tools, which have been built to purpose for the convertible trading and portfolio management lifecycles.

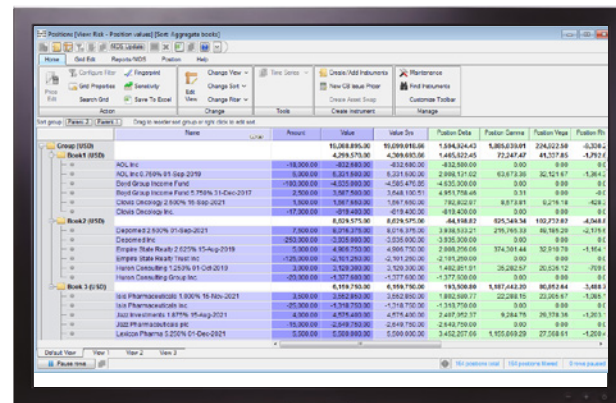
Now supporting even more rapid calculations, Monis's state-of-the-art solutions for convertible strategies integrate seamlessly with its comprehensive portfolio and risk management system to provide dedicated front-, middle and back-office workflows for:

- Stress testing
- Profit and loss
- Greeks across multiple instruments
- Exposures, coupons and dividends
- Connectivity to custodians
- Reconciliation
- Cash management
- Cash projections

Query the Monis Data Service



Analyzer Portfolio Aggregation



The user journey: getting the best from the Monis-Front Arena integration

FIS delivers a complete solution for managing the life cycle of convertible bond sales-trading, arbitrage and long-only strategies by integrating Monis with Front Arena.

The user journey begins with the ability to screen for convertible bonds through FIS' Monis Data Service, which provides accurate terms and conditions for the investable universe of convertibles. From here the instrument's details can be loaded directly into Front Arena's portfolio and risk management system, where the user can filter bonds according to coupon, credit risk and other criteria. All data will be automatically stored in Front Arena, including information on underlying yield curves, equity dividends and so on, allowing you to price any type of security seamlessly.

Through a single platform, users can therefore filter and identify bond opportunities, sell stock or options and add bonds as required, carry out full fund valuation – and gain a portfolio view of all market exposures for reporting to risk managers. The Monis Data Service and Analytics and Front Arena's front-to-back capability is a powerful combination. For example, Monis has built an integration giving users an XL-based idea generation desktop 'scratch pad' environment - which utilizes data securely stored in Front Arena's database.

Monis for hedge funds

As they strive to meet the multiple requirements of the convertible bond market, hedge funds require robust, sophisticated analytical and modeling capabilities. Through detailed scenario analysis, firms are better able to evaluate and identify market opportunities, assess the potential impact of trading strategies and manage risk across their portfolio.

To further support strategic decisions, hedge fund managers must also be able to rely on accurate terms and conditions and market data, for both the modeling and pricing of complex financial instruments.

Monis for asset managers

Long-only asset managers measure themselves against a benchmark index and strive to match or exceed its performance. To monitor their positions, exposure and performance against a benchmark it is essential to make the comparison straightforward, highlighting areas where the fund is under or over allocated relative to the index, to a specific sector or even to the individual bond level. By comparing the underlying risk numbers across a portfolio which may contain convertible bonds and a number of other asset classes for hedging purposes, managers can determine exactly how to build their exposure to selected market factors. Robust analysis, a broad range of asset coverage and simple, intuitive interfaces for comparison and clear aggregation of risk mean that managers have a focused understanding of their exposure, both outright and relative to their tracking target.

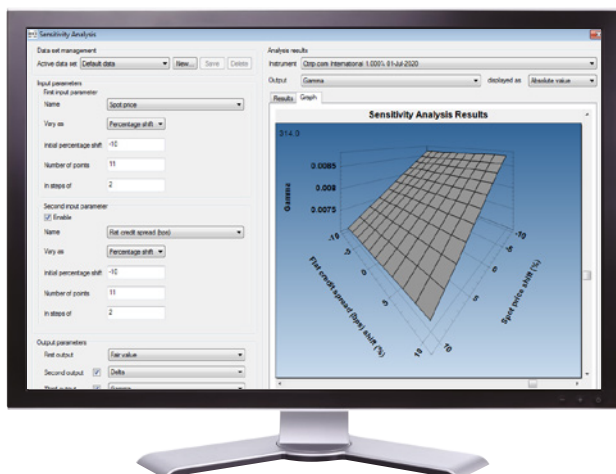
Monis for traders

A sales trading operation has to track the convertible bonds in which it makes markets, monitoring outstanding client orders and generating credible and relevant sales suggestions. The complex interaction of these requirements requires sophisticated watch listing functionality, reliable, robust and flexible dollar naking to maintain quotes and to rapidly track when previous and current client order interest intersects with prevailing market conditions. The ability to quickly access information pertinent to a sales call will often help determine a transactions' success. Monis provides analysis and modeling, pricing, trading and portfolio management tools, with a wide range of asset classes, including convertible bonds, equity options, FX options and interest rate derivatives.

FIS can help

The convertible bonds market is highly specialized – and nobody understands it quite like Monis. With our deep understanding of the complexity of pricing and modelling convertible bonds, we provide data and analytics as an integrated part of our solutions and a support desk staffed by former traders and portfolio managers. Backed by more than 20 years of experience in the business, our data is managed by a team of convertibles specialists and sharpened by the eyes of users from more than 400 institutions. Built and run by experienced professionals in convertible markets, Monis provides a unique, comprehensive and flexible solution to the challenges and complexities of convertible bonds, for all convertible market participants.

Sensitivity Analysis Gamma





**ADVANCING THE WAY THE WORLD
PAYS, BANKS AND INVESTS™**



www.fisglobal.com



twitter.com/fisglobal



getinfo@fisglobal.com



linkedin.com/company/fisglobal

About FIS

FIS is a global leader in technology, solutions and services for merchants, banks and capital markets that helps businesses and communities thrive by advancing commerce and the financial world. For over 50 years, FIS has continued to drive growth for clients around the world by creating tomorrow's technology, solutions and services to modernize today's businesses and customer experiences. By connecting merchants, banks and capital markets, we use our scale, apply our deep expertise and data-driven insights, innovate with purpose to solve for our clients' future, and deliver experiences that are more simple, seamless and secure to advance the way the world pays, banks and invests. Headquartered in Jacksonville, Florida, FIS employs about 55,000 people worldwide dedicated to helping our clients solve for the future. FIS is a Fortune 500® company and is a member of Standard & Poor's 500® Index. For more information about FIS, visit www.fisglobal.com

©2019 FIS

FIS and the FIS logo are trademarks or registered trademarks of FIS or its subsidiaries in the U.S. and/or other countries. Other parties' marks are the property of their respective owners.
819975