On the Edge

Interactive Data

Quarter 2, 2007, Volume 22, No. 2

Interactive Data-level Rebranding Initiative

As the president of Interactive Data Fixed Income Analytics, I wanted to personally communicate to you on the details of an Interactive Data-level rebranding initiative launched in late February. We continue to be driven by an important goal: to help meet the increasingly complex needs of all our customers worldwide.

We have evolved into a financial information organization trusted by many of the world's leading financial institutions. Our businesses offer a comprehensive range of enterprise-wide services that include real-time data, pricing and reference data, fixed income evaluations, sophisticated analytics and customized financial information portals and terminals. By focusing on your needs, continually monitoring the global markets and investing in our capabilities, we can help you better anticipate and address the changes that are shaping our industry.

Until now, we have marketed our businesses under several names. Going forward, to help simplify our story and underscore our organization-wide capabilities across the front, middle and back offices, we are consolidating our marketing efforts for our three institutional businesses under the Interactive Data brand.

- FT Interactive Data is now **Interactive Data Pricing and Reference Data**.
- ComStock is now **Interactive Data Real-Time Services**.
- CMS BondEdge is now **Interactive Data Fixed Income Analytics**.

Interactive Data Managed Solutions, which provides customized financial information systems, and **eSignal**, which provides desktop solutions with global, real-time market data and decision-support tools to active traders and investment professionals worldwide, will retain their names.

Please note that although we now have new names for three of our businesses, there will be no changes to your current services. Each business will continue to be led by its current management team, and your sales and support contacts will remain unchanged.

We have come a long way in recent years, with annual sales well in excess of $600 million, a strong balance sheet that gives us the strength to invest in our businesses, offices that now span the globe and a growing staff of more than 2,200 dedicated employees. Moving forward, a top priority will be investing in and further aligning our teams across the world to sharpen our focus on your needs, so that we can continue to help you succeed in today's tougher environment.

On behalf of everyone at Interactive Data, thank you for your continued confidence in us.

Sincerely,

Laurie S. Adami
President
Interactive Data Fixed Income Analytics

Top

2007 BondEdge Annual Fixed Income Workshops: L.A. Workshop a Success

Time is running out to register for the **2007 BondEdge Annual Fixed Income Workshops** in Chicago and New York. Our recent Los Angeles event was a great success and we are certain that our upcoming workshops in Chicago and New York will be no exception.

This year's Annual Fixed Income Workshops will be presented in primarily two tracks, and will cover fixed income theory as well as practical applications of various BondEdge features. This year we are featuring sessions specifically designed to address current issues in fixed income as well as interactive sessions for one-on-one training with Interactive Data Fixed Income Analytics senior consultants. We hope you will be able to join us this year at one of the following locations:

Tuesday, May 8	**Thursday, May 10**
Chicago (Downtown)	New York (Midtown)

While the topics are presented in lecture format, the event is intended to be as interactive as possible; we encourage attendees to ask questions during the sessions or during the break times provided. This year's workshop sessions are:

		TRACK A	TRACK B	TRACK C
	8:00a	Registration & Breakfast		
	8:30a		*New!* Up Close with BondEdge®	
	9:00a	Keynote Address		
New Time!	9:45a	Performance Attribution in BondEdge	MBS & ABS: Evolving Markets & Models	
	11:00a	AM Break		
New Time!	11:15a	Benchmarking with Compare & Matrix Management	Managing Municipal Bond Portfolios with BondEdge	MBS & ABS: Evolving Markets & Models *Just Added!*
	12:45p	Lunch – *Plus!* Sneak Preview: Next Generation BondEdge		
New Time!	1:50p	Simulations in BondEdge	Insurance Market Applications in BondEdge	
	2:50p	PM Break		
	3:00p	Market Risk Factors: Focus on Credit Spreads	Term Structure Modeling & Interest Rate Paths	*New!* BondEdge User's Toolkit
	4:00p	Cocktails & Hors d'oeuvres		

To view detailed session descriptions, please click here.

To register, please click here.

Top

Interactive Data Fixed Income Analytics to Participate in Spring Municipal Conferences

We are pleased to announce Interactive Data Fixed Income Analytics will participate in two key industry conferences this spring:

Date(s):	Event:	Location:
May 16-18	National Federation of Municipal Analysts (NFMA) Annual Conference	Las Vegas, NV
June 26	World Research Group (WRG) Municipal Bonds Summit	New York, NY

Interactive Data will serve as **Gold Sponsor at the NFMA Annual Conference** on May 16-18 in Las Vegas. Interactive Data Fixed Income Analytics will exhibit alongside Interactive Data Pricing and Reference Data and will **sponsor a luncheon on May 17**. In addition, Interactive Data will **host a cocktail reception on May 17 from 5:00-6:30 PM**. The reception will be a great opportunity to interface directly with Interactive Data representatives in an interactive setting.

Next, during the Municipal Bonds Summit on June 26 in New York City, **Lou Gehring** will speak on a 45-minute panel discussion, **"Employing Cutting-edge Tools and Methodologies for Municipal Bond Attribution Modeling,"** from 10:45-11:30 AM, which will include such topic subsets as factors in achieving and measuring returns and methodologies for performing factor-based and returns-based analysis.

For more information about the NFMA conference, please contact Lisa Good at (412) 341-4898 or via email at lgood@nfma.org and mention Interactive Data Fixed Income Analytics.

For more information about the World Research Group event or to register, please contact Christopher Torres at (646) 723-8039 or via email at christopher.torres@worldrg.com and mention Interactive Data Fixed Income Analytics.

For the complete Interactive Data Fixed Income Analytics 2007 Tradeshow, Seminar & Conference Schedule, please click here or call Interactive Data Fixed Income Analytics Marketing at (310) 479-9715.

Top

1st Quarter 2007 Fixed Income Markets Review: *Market Flash*

Total returns on fixed income benchmarks were positive in the 1st quarter, mostly due to a significant Treasury curve rally during February, sparked by "flight to safety" factors as sub-prime mortgage concerns heightened. Rising rates in January and March, however, offset much of these gains with the result that bond prices, on average, moved only modestly higher for the full quarter. The range of asset class returns within fixed income was relatively narrow for the quarter.

The above is a partial reprint of our quarterly capital markets report, "Market Flash". ***To view this report in its entirety, please click here.***

Top

BondEdge News

BondEdge Version 5.5x - *Now Available!*

BondEdge version 5.51 is now available, offering a number of important enhancements as described below. The window for upgrading to version 5.5x will continue through July 31st.

TBA CUSIPs & Dollar Rolls – TBA Mortgage CUSIPs have been added to the BondEdge database. With this version, you can add TBA CUSIPs to your portfolios to reflect your exposure and to capture Dollar Roll strategies for performance attribution (Click here for related article).

New Simulation Tools – The Specified Scenario and Compare Probability-Weighted Return simulations have been significantly upgraded in this version. For Corporate bonds, spread changes can now be input by specific industry and/or by Issuer, changes in MBS spreads can be specified by collateral type for pass-throughs, and/or or by tranche type for CMOs, and Muni portfolio managers can input spread changes by the primary classification (G.O., Revenue, Pre-Refunded, ETM and Insured) and even by Use/Type (e.g., Education, Hospital, etc.). Scenarios can be shared between the two analyses, and both simulations now offer the ability to run "Instantaneous" shifts to the yield curve using duration-matched or maturity-matched logic. Clients who wish to import a large number of non-parallel interest rate shifts to generate a distribution of outcomes for VaR-type testing can do so with a new scenario importing capability.

Adjustable Rate Home Equity Loan Prepayment Model – Version 5.5 includes a new prepayment model for deals backed by Adjustable Rate Home Equity Loans. As investors continue to analyze the credit issues facing the sub-prime market, our prepayment model can help you to assess the prepayment risk associated with these deals. The model incorporates the impact of default and credit curing in its prepayment projections, along with the refinancing incentive and other loan characteristics (Click here for related article).

Municipal Portfolio Management Tools – Version 5.5x includes more tools for private wealth managers, P&C insurers, banks and others who manage portfolios containing both tax-exempt and taxable securities. We now provide more descriptive information for municipal securities, including underlying ratings for insured bonds, more information about credit enhancement and other data. An expanded Contribution to Duration report now categorizes Munis by type to help understand interest rate risk for this sector, and we have revised our sector listings to be consistent with those used by the major muni index providers. The custom report writer has a new Muni Distributions field that summarizes key characteristics in a single selection, showing the % of holdings that are taxable, tax-exempt (Federal, State or both), Credit Enhanced, Callable, Trading to Call, Puttable, OID, Bank Qualified or subject to the AMT. The Muni Holdings report now shows Acquisition information, # of Days Held and Gain/Loss for tax-planning purposes. Finally, the Portfolio Alerts report now shows recently pre-refunded municipal bonds to help clients track the impact of these actions on their portfolios.

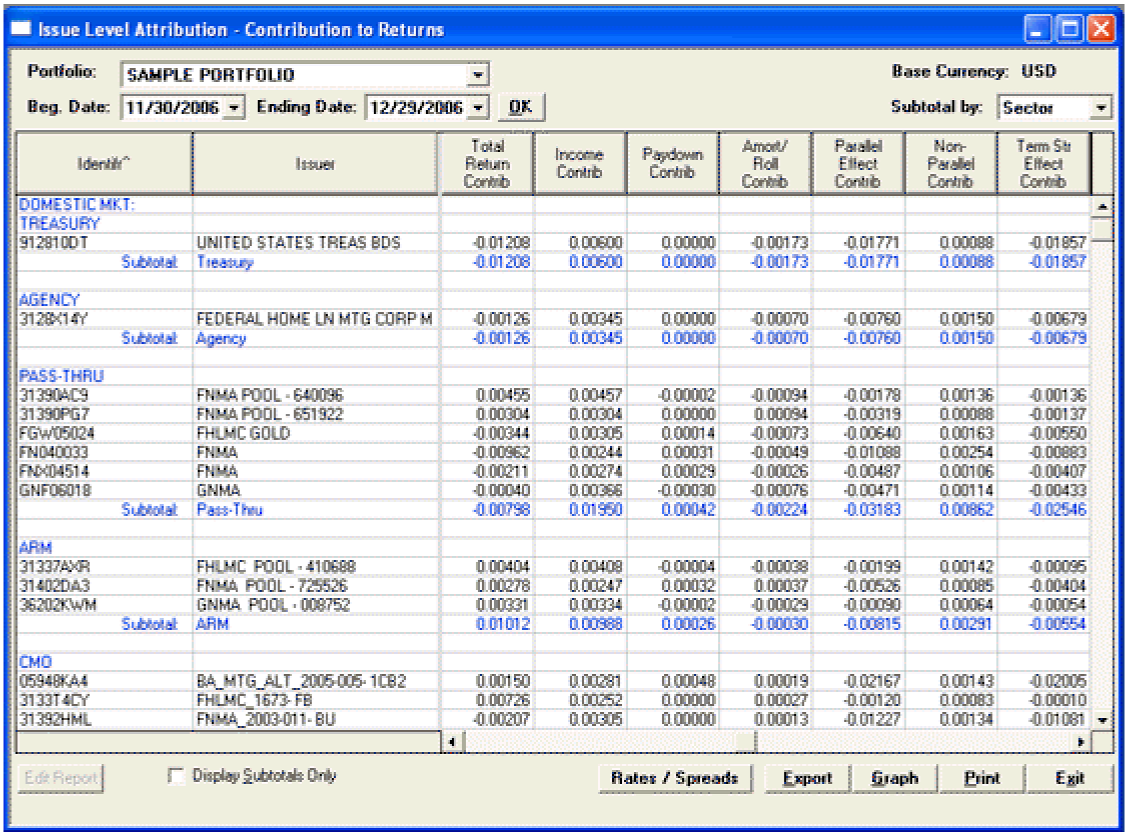
We also now have the constituent level data for the Lehman Brothers Municipal Bond indices and have made certain of these Muni indices available for portfolio versus benchmark comparisons and Returns-based Performance Attribution (more will be added upon request). *If you are interested in subscribing to the Lehman Muni indices, please contact your BondEdge Representative.*

Performance Attribution with Custom-weighted Indices – You can now use custom-blended indices (e.g., 30% of Index 1, 50% of Index 2, 20% of Index 3) in Factors-based Performance Attribution (PART) analyses. We are working to offer the same functionality in the Returns-based Attribution system later this year.

Clients who wish to upgrade to version 5.5x at this time or who wish to install a test version before upgrading a production system should contact their BondEdge Representative or the Client Services Group for assistance.

BondEdge Version 5.6 - *Coming Soon!*
Release Date: October, 2007

As we focus our efforts on developing the new BondEdge Microsoft® .NET Framework-based system for release next year (Click here for related article), we will be offering a limited set of enhancements for the remainder of 2007. BondEdge version 5.60, tentatively scheduled for release in October 2007, will offer a flexible new Factors-Based Performance Attribution Issue-Level Report Writer that will allow you to build customized attribution reports, showing individual security performance and contribution to return information across all categories of the attribution analysis. You will be able to subtotal by sector, quality rating, country or currency, and full exporting capability will be included.



Identifr^	Issuer	Total Return Contrib	Income Contrib	Paydown Contrib	Amort/ Roll Contrib	Parallel Effect Contrib	Non-Parallel Contrib	Term Str Effect Contrib
DOMESTIC MKT:								
TREASURY								
912810DT	UNITED STATES TREAS BDS	-0.01208	0.00600	0.00000	-0.00173	-0.01771	0.00088	-0.01857
Subtotal	Treasury	-0.01208	0.00600	0.00000	-0.00173	-0.01771	0.00088	-0.01857
AGENCY								
3128X14Y	FEDERAL HOME LN MTG CORP M	-0.00126	0.00345	0.00000	-0.00070	-0.00760	0.00150	-0.00679
Subtotal	Agency	-0.00126	0.00345	0.00000	-0.00070	-0.00760	0.00150	-0.00679
PASS-THRU								
31390AC9	FNMA POOL - 640096	0.00455	0.00457	-0.00002	-0.00094	-0.00178	0.00136	-0.00136
31390PG7	FNMA POOL - 651922	0.00304	0.00304	0.00000	0.00094	-0.00319	0.00088	-0.00137
FGW05024	FHLMC GOLD	-0.00344	0.00305	0.00014	-0.00073	-0.00640	0.00163	-0.00550
FN040033	FNMA	-0.00962	0.00244	0.00031	-0.00049	-0.01088	0.00254	-0.00883
FNX04514	FNMA	-0.00211	0.00274	0.00029	-0.00026	-0.00487	0.00106	-0.00407
GNF06018	GNMA	-0.00040	0.00366	-0.00030	-0.00076	-0.00471	0.00114	-0.00433
Subtotal	Pass-Thru	-0.00798	0.01950	0.00042	-0.00224	-0.03183	0.00862	-0.02546
ARM								
31337AXR	FHLMC POOL - 410688	0.00404	0.00408	-0.00004	-0.00038	-0.00199	0.00142	-0.00095
31402DA3	FNMA POOL - 725526	0.00278	0.00247	0.00032	0.00037	-0.00526	0.00085	-0.00404
36202KWM	GNMA POOL - 008752	0.00331	0.00334	-0.00002	-0.00029	-0.00090	0.00064	-0.00054
Subtotal	ARM	0.01012	0.00988	0.00026	-0.00030	-0.00815	0.00291	-0.00554
CMO								
05948KA4	BA_MTG_ALT_2005-005- 1CB2	0.00150	0.00281	0.00048	0.00019	-0.02167	0.00143	-0.02005
3133T4CY	FHLMC_1673- FB	0.00726	0.00252	0.00000	0.00027	-0.00120	0.00083	-0.00010
31392HML	FNMA_2003-011- BU	-0.00207	0.00305	0.00000	0.00013	-0.01227	0.00134	-0.01081

As mentioned above, we are adding the ability to use custom-blended indices in Returns-based Attribution analyses for clients who wish to analyze returns in this framework against a blend of indices. Also in version 5.60, we'll be adding new Coupon Type fields to the Report Writer so that you can easily identify all of the fixed rate, floating rate, fixed-to-floating rate, step-up and inflation-indexed securities in your portfolios. Finally, for clients with multi-user installations we're adding additional log-in security features to help you comply with internal requirements.

If you have any questions about these features or are interested in obtaining the pre-release of version 5.60 as soon as it is available, please contact your BondEdge Representative.

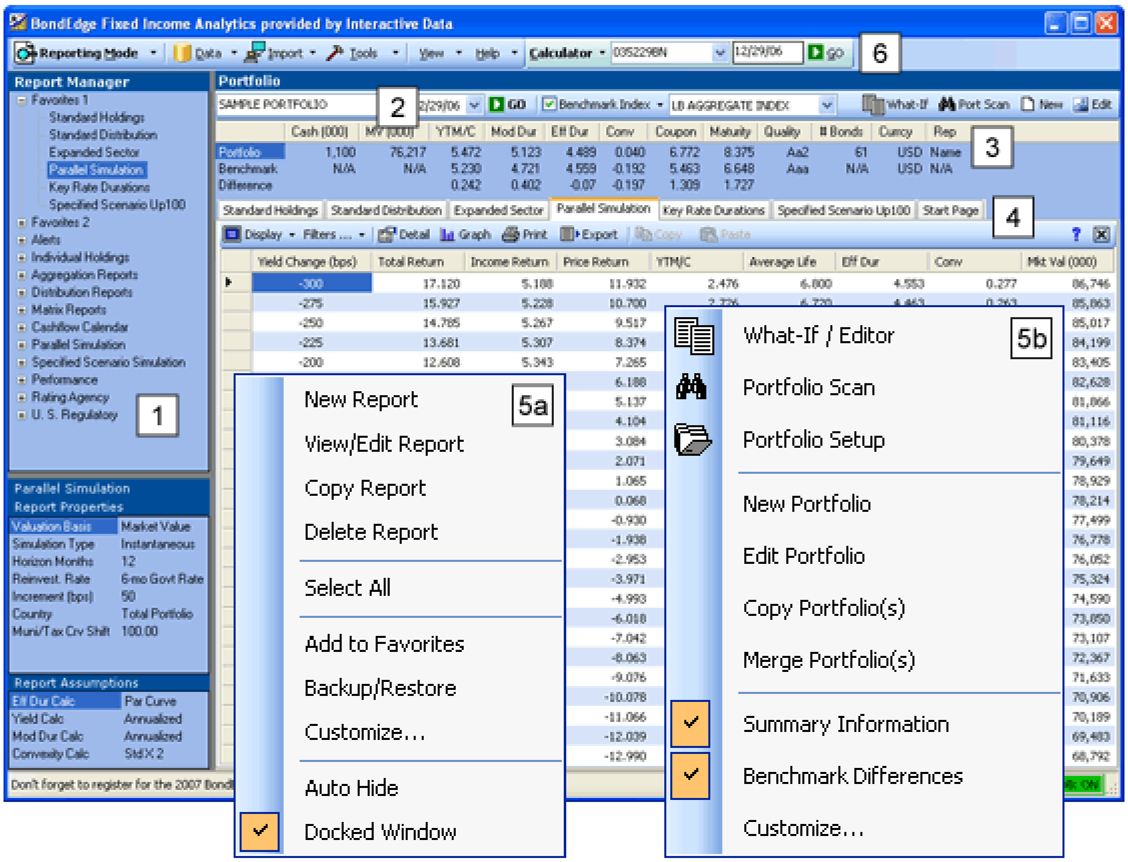
Top

First Look! Next Generation BondEdge with Microsoft® .NET Framework

We are excited to announce the development of the next generation of BondEdge, employing the Microsoft® .NET Framework[1]. With this effort we are not only modernizing some of the architecture of the system, we are updating and redesigning the user interface including the reporting and navigation tools. The design effort is well underway, and we are commencing with a significant change to the underlying logic used to create the reports and analyses throughout BondEdge. This effort will give clients maximum flexibility to customize output and will allow us to streamline our product development process.

Although our clients often tell us that BondEdge is already among the most user-friendly of systems with an intuitive user interface, this technology upgrade gives us the opportunity to make some key improvements in this area. After gathering feedback from our clients, surveying other applications and adopting some interface standards that have evolved in recent years, we have designed a way to navigate the system that is more flexible, requiring fewer "mouse clicks" and providing access to important portfolio, benchmark and individual security information at all times, with drill-down capabilities throughout.

Attendees at our upcoming workshops in Chicago and New York will see a sneak preview of the new user interface, and we are pleased to provide you with some of the highlights below:



1) The new navigation scheme includes a left-side Report Manager panel with all of the reporting choices displayed in "folders". Once a portfolio is selected you can move back and forth among any of the reports, simulations or benchmark comparisons, including What-If Analyses, Performance Attribution, Dynamic Asset Cashflow, etc., with no need to re-select the portfolio.

2) To switch to another portfolio, or view information as of another date simply select from the drop-down portfolio and pricing date lists that are always displayed at the top of the screen.

3) Since your portfolio's and benchmark's summary characteristics are so important, we've made room to display them at the top of the screen – you don't have to run a separate report to monitor this information (you can hide this section if you wish).

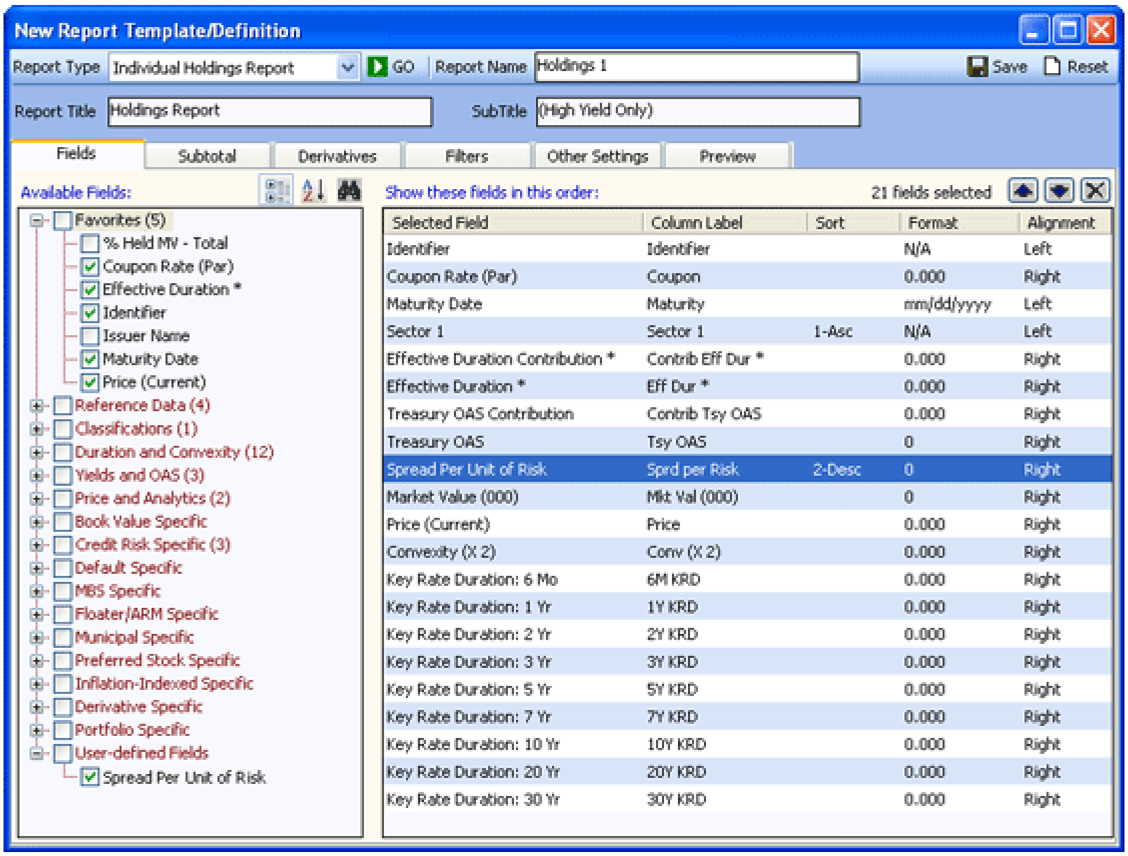
4) We know there are certain reports you need to run all the time, so we're making it easy to access them using this customizable set of "favorites" tabs that appear across the top of the main section of the reporting screen.

5a) A right-click menu on the Report Manager panel allows you to quickly access the custom Report Writer, edit your field selections, add reports to your "Favorites" tabs and control other report settings.

5b) Another right-click menu on the main screen lets you perform portfolio-related functions, such as editing, copying or merging, or scanning your holdings to find bonds that meet certain criteria.

6) Want to quickly analyze an individual security? At the top of the screen, the new Security Calculator input field allows you to specify a CUSIP and pricing date to retrieve detailed security information, including total return and cashflow screens, and in-depth OAS analysis.

The Report Writer capabilities are undergoing a substantial upgrade, giving you the ability to control the format and alignment of each field in your reports, allowing you to define fields using mathematical operators (e.g., Spread Per Unit of Risk = Treasury OAS ÷ Effective Duration) and grouping field names together in "folders" to make it easier to find what you need. The major architectural change will be to generate all reports from a common "engine," making it seamless to add new fields across any number of reports while ensuring consistency in the way reports are presented.



These are just some of the new features we have built into the new Microsoft .NET Framework-based interface. While we do not yet have a firm delivery date for the Microsoft .NET Framework-based version of BondEdge we plan to have a Beta ready by the end of this year. We look forward to sharing more of these details in the months to come.

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[1] For non-technical readers (which includes this author), Microsoft .NET is an approach to programming that uses a "class library" covering a large range of programming tools including: User interface, data access, database connectivity, web application development, numeric algorithms, and network communications. The functions of the class library are used by programmers who combine them with their own code to produce applications.

Top

Returns-based Performance Attribution Case Study with the Lehman Muni Index

Lehman Municipal Indices, including constituent-level data, have recently been added to BondEdge. These indices are available throughout the components of the system related to portfolio vs. benchmark analysis, including Policy, Indices, Compare, and Returns-based Performance Attribution.

As an illustration of the additional capabilities supported by having access to the constituent-level Lehman Municipal Indices, in this quarter's newsletter we present an example of the analysis available within the Returns-based Performance Attribution system.

Exhibit 1 contains a detailed returns comparison between a sample municipal portfolio and the Lehman Municipal Bond Index for the month of March 2007. In this example, the returns for the portfolio and benchmark have been sliced into user-specified effective duration buckets, and then into sector components. The municipal sectors may be reported at either a summary level (e.g., GO/Revenue/Insured/Pre-Refunded, Escrowed to Maturity) or at a more granular level (e.g., Revenue is broken into sub-sectors such as Electric, Hospital, etc.).

In this example, the sample portfolio underperformed the Lehman Municipal Index by 28 basis points (bps) during the month of March (-0.49% vs. -0.21%). The "Analytics" section of the report indicates that, from a duration bucket weighting perspective, 8 bps of this underperformance is attributed to overall unfavorable duration buckets weightings (i.e., an unfavorable curve mismatch vs. the benchmark), while an additional 20 bps of underperformance can be attributed to poor selection within duration buckets.

A graphical representation of the relative performance (Exhibit 2) by duration buckets helps to pinpoint the significant contributors to the underperformance. The sample portfolio had a significant barbell vs. the benchmark at the long end of the curve as evidenced by the overweight in the 10+ effective duration bucket (25% vs. 10%). During the month of March, the municipal curve (as measured by the AAA, GO curve) experienced a significant bearish steepening, with short term rates largely unchanged and 10/30 year yields moving up 10 and 15 bps, respectively.

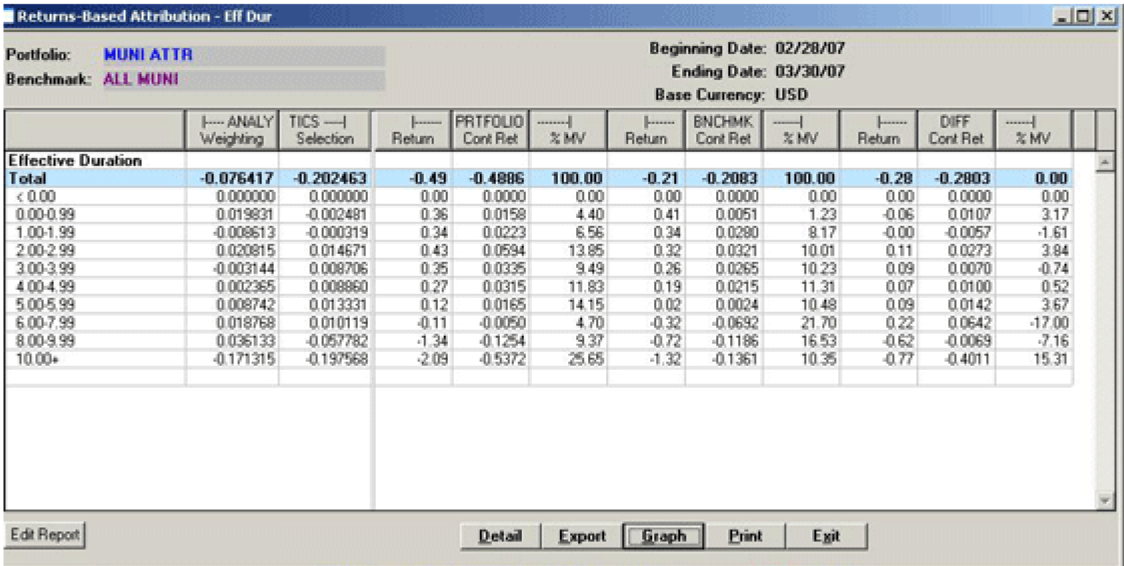
While the sample portfolio's overall effective duration was only slightly longer than the benchmark, the substantial curve mismatch in the 10+ duration bucket translated into 17 bps of underperformance (this can be seen in the "Weighting" column for the 10+ duration bucket), only a portion of which was mitigated by underweights in the middle of the curve.

In addition to unfavorable duration bucket weightings, the sample portfolio also significantly underperformed the benchmark at the long end of the curve (-2.09% for the portfolio vs. -1.32% for the index). This underperformance in the 10+ bucket was the primary contributor to the – 20 bp selection effect for the portfolio vs. the benchmark. Drilling down to the security level detail for the portfolio (this same functionality exists for the benchmark) would reveal that a significant exposure to a Tennessee issuer (Tennessee Energy Acquisition) had a detrimental effect on performance (please see Exhibit 3).

The analysis described here is just one of many ways that relative performance between a municipal portfolio and a benchmark may be measured. Performance may also be broken out along the term structure by user-specified average life or duration to worst buckets. Further performance decomposition is also available by quality, state, and coupon buckets.

The Lehman Municipal indices are available to Lehman-approved clients for an additional subscription fee. Please contact your BondEdge client service representative for more details on this offering.

Exhibit 1



Returns-Based Attribution - Eff Dur

Portfolio: MUNI ATTR
Benchmark: ALL MUNI

Beginning Date: 02/28/07
Ending Date: 03/30/07
Base Currency: USD

	ANALYTICS		PRTFOLIO			BNCHMK			DIFF		
	Weighting	Selection	Return	Cont Ret	% MV	Return	Cont Ret	% MV	Return	Cont Ret	% MV
Effective Duration											
Total	**-0.076417**	**-0.202463**	**-0.49**	**-0.4886**	**100.00**	**-0.21**	**-0.2083**	**100.00**	**-0.28**	**-0.2803**	**0.00**
< 0.00	0.000000	0.000000	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00
0.00-0.99	0.019831	-0.002481	0.36	0.0158	4.40	0.41	0.0051	1.23	-0.06	0.0107	3.17
1.00-1.99	-0.008613	-0.000319	0.34	0.0223	6.56	0.34	0.0280	8.17	-0.00	-0.0057	-1.61
2.00-2.99	0.020815	0.014671	0.43	0.0594	13.85	0.32	0.0321	10.01	0.11	0.0273	3.84
3.00-3.99	-0.003144	0.008706	0.35	0.0335	9.49	0.26	0.0265	10.23	0.09	0.0070	-0.74
4.00-4.99	0.002365	0.008860	0.27	0.0315	11.83	0.19	0.0215	11.31	0.07	0.0100	0.52
5.00-5.99	0.008742	0.013331	0.12	0.0165	14.15	0.02	0.0024	10.48	0.09	0.0142	3.67
6.00-7.99	0.018768	0.010119	-0.11	-0.0050	4.70	-0.32	-0.0692	21.70	0.22	0.0642	-17.00
8.00-9.99	0.036133	-0.057782	-1.34	-0.1254	9.37	-0.72	-0.1186	16.53	-0.62	-0.0069	-7.16
10.00+	-0.171315	-0.197568	-2.09	-0.5372	25.65	-1.32	-0.1361	10.35	-0.77	-0.4011	15.31

Edit Report Detail Export Graph Print Exit

Exhibit 2

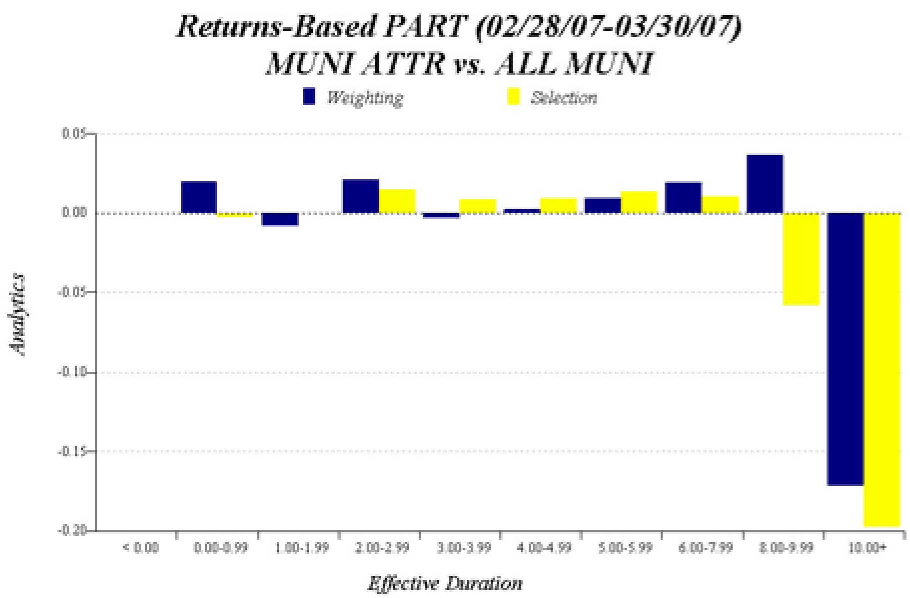
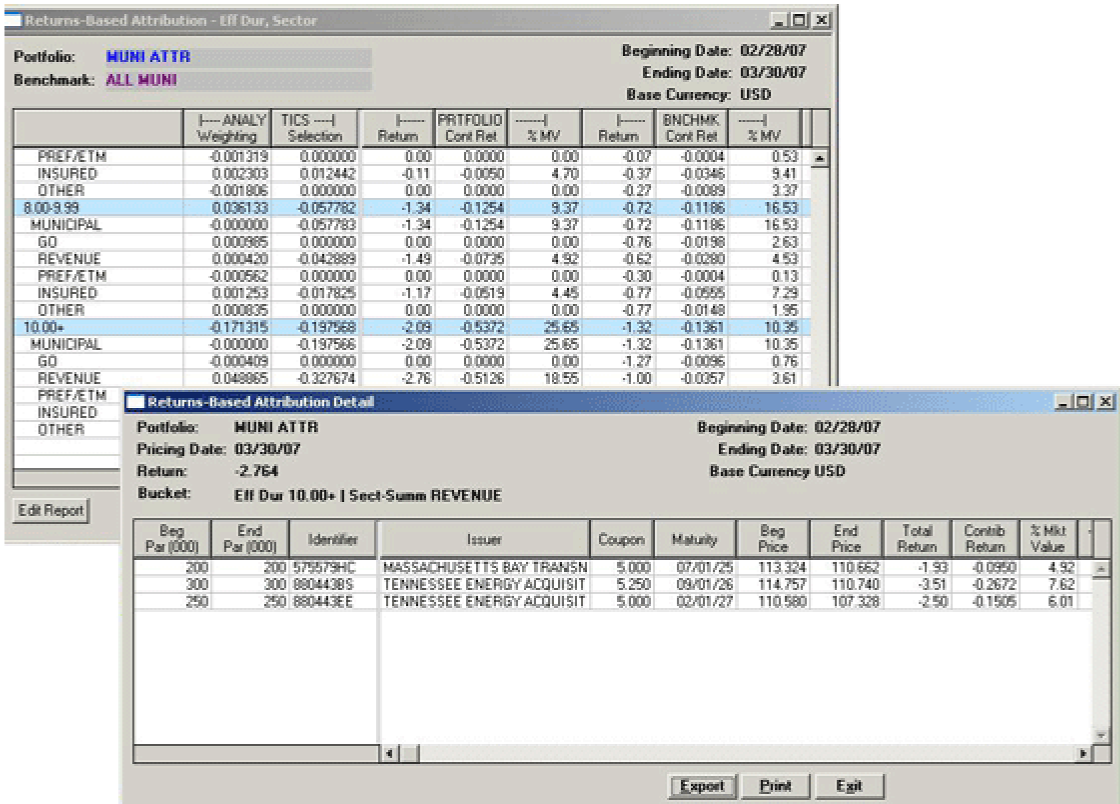


Exhibit 3



Top

Simulations in BondEdge

BondEdge offers at least 20 different reports and analyses involving some type of simulation. In these analyses, a portfolio's or security's value is forecasted or recomputed under conditions that differ from the starting environment, which could include changes in interest rates, changes in spreads, the passage of time, changes in volatility, or some combination of these factors. These are in addition to the calculation of option-adjusted duration and convexity, which itself entails two simulated shifts (upward and downward) to the appropriate benchmark term structure of interest rates. In this article, we review the major categories of simulations in BondEdge and some of the key assumptions behind the numbers.

General Framework

In all simulations, each bond's price at the horizon date is determined by invoking the appropriate option model (even for non-callable bonds, although the impact of the option valuation step is zero) or Monte Carlo valuation for path-dependent securities. The ending interest rate environment is determined from the scenario, and the bond's OAS, which is derived from the starting market price and is either held constant or shifted according to the scenario inputs.

Instantaneous vs. Aged

BondEdge offers a choice of "Instantaneous" or "Aged" mode in certain portfolio total return simulations, including the Specified Scenario and Parallel simulations. Instantaneous mode allows portfolio managers to replicate the concept of rebalancing their holdings within the simulation context, to avoid having the portfolio's duration shorten as time passes. The portfolio earns income based on the number of months specified, while the prices of the securities react to the change(s) in interest rates and/or spreads without allowing their time to maturity to shorten. For example, a portfolio containing a 5-year Treasury is assumed to still hold a 5-year Treasury at the end of a 12-month Instantaneous simulation, and that bond's ending price in the simulation is a function of the remaining cash flows for the next five years. In contrast, in "Aged" simulations a security's time to maturity does shorten over the horizon, so at the end of a 12-month Aged simulation the portfolio above would be revalued as if it held a 4-year Treasury. In both types of simulations, the Income earned is reinvested at the originally specified reinvestment rate, adjusted for any change in the short-term (6-month) rate in the scenario.

A few other distinctions between Instantaneous and Aged simulations: In Instantaneous mode, rate shocks occur immediately and the reinvestment rate is impacted by the full amount of the shock at the beginning of the simulation. In Aged mode, shocks occur gradually and affect the reinvestment rate gradually. For mortgage-backed securities, changes in prepayment speeds occur gradually in an Aged simulation, versus immediately in an Instantaneous analysis. All individual security return analyses are Aged, whereas all Portfolio versus Index simulations are Instantaneous, since benchmark indices are always rebalanced. Note that in Instantaneous simulations, there is no "Roll" return, as securities are not approaching maturity, with the exception of Compare's Probability-Weighted Return simulation where one month's worth of roll return is computed, then compounded for the number of months in the analysis.

Book Value Simulations

In Book Value simulations, the focus is on projecting future book values (which change due to amortization and FAS 91 considerations, for MBS), future book yields (FAS 91-dependent) and unrealized gains/losses under different environments. Any cash flows occurring during the horizon period are assumed to be diverted to pay liabilities and are not reinvested in the portfolio. Therefore, there is no reinvestment of coupon receipts or principal repayments, no calculation of total return, and the ending portfolio may have a composition that is quite different from the starting portfolio, as short-term instruments may have matured during the simulation period.

Cash Flow Simulations

The BondEdge Cash Flow Testing module forecasts portfolio cash flows under any type of interest rate scenario, where rates can change as often as monthly, over time periods of 40 years or longer. Clients can run hundreds of scenarios in batch modes to determine the possible distribution of cash flow outcomes over time. The emphasis here is on projecting accurate cash flows as well as book yields with FAS 91 logic, if desired, while valuations at each date within the scenario are of secondary importance, except for callable/puttable bonds where the valuation determines whether or not the option is exercised, and therefore what cash flows will occur on a given date.

Factor-Based Performance Attribution

Most portfolio managers likely do not consider performance attribution to be a simulation, as it is not a forecast of what would happen if certain conditions occurred in the future but an analysis of what has already transpired. However, since performance attribution explains portfolio returns in terms of changes in interest rates, changes in spreads and the passage of time it is essentially the same as running simulations viewed through a rear-view mirror. We allow time to pass by moving each security's valuation (Settlement) date from the beginning to the ending recording date and simulating the change in its value (including accrued interest) due to this passage of time to compute income and roll/amortization. We compute an overall term structure effect by shifting the initial yield curve by the known change in interest rates over the period and revaluing each holding, then simulate a hypothetical parallel yield curve shift to divide the overall term structure effect into its Parallel and Non-Parallel components. We then determine the impact of changes in market spreads by shifting each bond's starting OAS by the weighted average change in OAS for bonds of its type (its "peer group") and running yet another revaluation. The bond-specific Selection Effect is simply the difference between the sum of these simulated changes in value (under the *ex post* changes in the factors of time, interest rates and spreads) and the bond's actual price change.

There are many other analyses in BondEdge that include some type of simulations, including the Key Rate Duration report, the Tracking Error analysis, the Total Return Optimizer, etc., and the methodologies used in these analyses are consistent with those described above.

We hope this discussion has made the results of all BondEdge simulations more transparent, and can help *you to decide which simulation is best for your specific needs. If you have other questions regarding the simulations in BondEdge, please contact the Client Services Group or your BondEdge Consultant.*

Top

Focus on Term Structure Models

This brief article summarizes a key concept in fixed income analytics, the notion of how to describe, within an analytical framework, the evolution of interest rates over time. This concept of a "term structure model" is an attempt to model mathematically the process that determines changes in interest rates.

Term Structure Models in Fixed Income Analytics

Interest rate risk is the major market risk that fixed income investors face. Over the last several decades, many term structure models (also known as interest rate models) have been proposed to characterize the evolution of interest rates, such as: Vasicek (V, 1977), Ho-Lee (HL, 1986), Hull-White (HW, 1990); Cox-Ingersoll-Ross (CIR, 1985); Dothan (D, 1980), Black-Karasinski (BK, 1991), Mercurio-Moraleda (MM, 2000); Longstaff-Schwartz (LS, 2001), Chen (C, 1996), etc.

Normal or Log-normal?

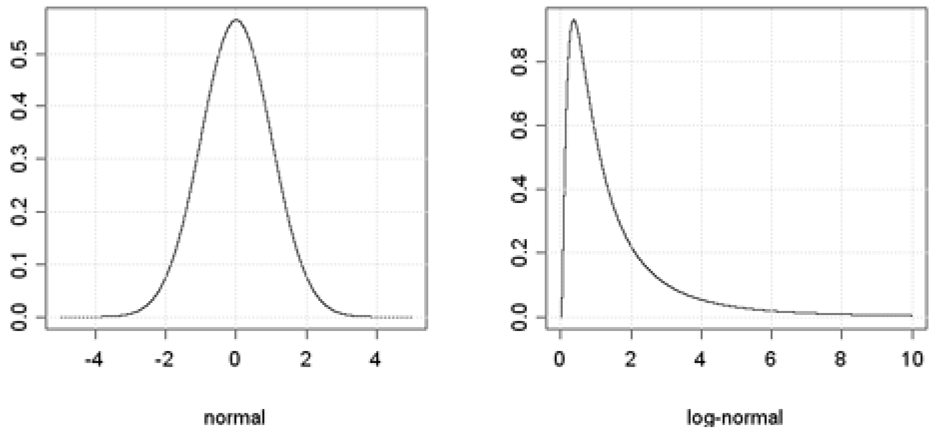
All of the above approaches assume that interest rates follow some underlying probability distribution. Although there is debate about which distribution best describes changes in interest rates, most models assume either a normal (e.g., V, HL, HW) or log-normal distribution (e.g., D, BK, MM) for the analytical tractability or the ease of implementation. The pros and cons of models with either underlying distribution assumptions can be better understood by looking at the definitions and characteristics of, and the relationship between these two distributions.

1) Normal and log-normal distributions are closely related. If X has a normal distribution, then Y=exp(X) will have a log-normal distribution. In other words, if Y is log-normally distributed, X=log(Y) will be normally distributed.

2) A normal random variable can assume all real numbers whereas a log-normal random variable can only be positive. Although log-normal models guarantee interest rates to be positive, they are often less tractable and they can also lead to model explosion (implausibly high rates) if not handled properly. Normal models usually offer good analytical tractability even though they can allow the possibility of negative rates. Parameters can be chosen to minimize the probability of negative rates occurring.

3) A normal random variable has a symmetric density function about its mean but this symmetry does not hold in a log-normal distribution (Figure 1).

Figure 1. Probability Density Distributions



4) The sum of independent normally distributed random variables is still normally distributed whereas the product of log-normal random variables has a log-normal distribution. Therefore, the normal distribution is often used to model a random variable that is additive with respect to many small random factors whereas the log-normal distribution is used to model a random variable that is the multiplicative product of many small independent random factors. For example, the log-normal distribution can be used to model long-term rates, since they can be viewed as the product of many short forward rates. However, empirical analysis of interest rate movements in the market indicates an actual distribution more normal than log-normal, adding credibility to the use of normal models.

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Top

Client Services Q & A

Q. **I am setting up a Municipal bond portfolio in BondEdge. Are there any settings I need to specify to "activate" the muni analytics throughout the system?**

A. In the File Management screen, you will need to specify the marginal tax rates (Federal and State) for portfolios containing tax-exempt Municipals if you want BondEdge to compute and use grossed-up taxable-equivalent yields for these bonds in determining the portfolio's overall yield, and the Domicile Code indicating the State where the owner of the portfolio resides (pays taxes). When calculating tax-equivalent yields in a portfolio, BondEdge uses the State Code to determine whether a municipal bond's yield should be grossed up by both the Federal and State tax rates (this occurs when the State Code of the bond matches the Domicile Code of the portfolio), or the Federal tax rate only. Note that the tax rates for portfolios containing 100% tax-exempt securities should be left at zero, as there is no need to gross up the yields to a taxable equivalent when there are no taxable bonds blended into the portfolio's yield.

A "duration beta" feature was also introduced in BondEdge recently. This feature allows managers of blended (taxable and tax-exempt) portfolios to express the relationship between changes in the benchmark muni yield curve and the Treasury curve. Applying a duration beta will adjust the durations of municipal securities relative to the durations of taxable instruments. You will need to identify the portfolios that contain a blend of taxables and tax-exempts by marking the appropriate check box on the File Management screen. The Duration Betas themselves are specified by accessing the Utility – Yield Curve Editors – Municipals menu.

Q. **What is LIBOR OAS and is it available in BondEdge?**

A. A bond's LIBOR OAS is the spread over the LIBOR curve (often called the LIBOR Swap curve, since the zero-coupon LIBOR "spot" rates are largely derived from the Swap curve) that equates the present value of a bond's expected future cashflows to its market price, incorporating the fact that the bond's cashflows may change under different interest rate environments. This is the same concept as the standard OAS (also called the Treasury OAS), except the underlying spot curve is derived from LIBOR rates, instead of from Treasury rates. Since LIBOR rates are higher than Treasury rates, the LIBOR OAS will be smaller than the Treasury OAS.

For corporate bonds with embedded options, the LIBOR OAS is derived using a "finite difference" grid to examine the impact of option features on cashflows across interest rates and through time. For mortgage-backed securities (pass-throughs, CMOs and ARMs), LIBOR OAS is derived using a Monte Carlo simulation which generates cashflows along various interest rate paths, using the appropriate prepayment model.

LIBOR OAS is displayed in the Security Valuation screen as well as in the BondEdge OAS Appraisal Report. The default BondEdge setting is to NOT compute LIBOR OAS in order to minimize security/portfolio processing time. If you would like this value to be computed during the portfolio import and/or portfolio reprice, go to the Utility – Default – Miscellaneous screen and mark the check box labeled "calculate Libor OAS during portfolio reprice."

Top