

Bemus Investment Management (BIM)

Bemus Investment Management (BIM) manages portfolios for institutional investors (primarily corporate pension plans) and wealthy individuals. BIM is located near Chautauqua Lake at Bemus Point, NY. Despite its bucolic location, BIM is linked real-time to all major markets and exchanges. In mid-2003, it had about \$1.4 billion under management. Its management fees averaged 55 basis points (.55%); so BIM's total revenue for 2003 will be about $(.0055)(1.4)(10^9) = \$7.7$ million.

BIM has landed a new client, Quest of Toys, a conservative, established manufacturer of toys and electronic games. Quest has a defined-benefit¹ pension plan for its employees. Current plan funding is \$101 million, with \$84 million in fixed-income securities (mostly U.S. Treasury bonds, notes and strips) and \$17 million in equities.

Exhibit 1 shows the current composition of the fixed-income portfolio. You have been assigned to restructure and then manage this portfolio. The management fee will be 35 basis points (0.35%) per year.²

¹ *Defined benefit* means that the company is committed to pay retirement income according to a formula. For example, annual retirement income could equal 40% of the employee's average salary in the five years prior to retirement. In a defined benefit plan, retirement income does not depend on the performance of the pension fund, provided, of course, that the assets in the fund are sufficient to cover pension benefits. If the assets are not sufficient, the company is required to contribute enough additional cash to cover the shortfall.

In *defined contribution* plans, the corporation contributes to the pension fund on behalf of its employees. Each employee owns part of the fund, just as if the employee held shares in a mutual fund. Employees' retirement incomes depend on their balances in the fund at retirement. In this case, retirement income is directly linked to fund performance.

² Management fees are almost always lower for fixed-income portfolios than for equity portfolios.

Exhibit 2 shows a projection of Quest's obligations to its already-retired employees from 2004 to 2025. Each of these employees receives a fixed dollar amount each month. Total dollar payments from the fund decline as the employees die off.³

Quest seeks to cover most of the obligations shown in Exhibit 2 from the \$84 million now invested in its fixed-income portfolio, and from this fixed-income portfolio's future earnings. If the fixed-income portfolio is insufficient to cover these obligations, Quest will have to draw down the equity portfolio and/or make additional contributions to the pension fund.

After reviewing Quest's existing portfolio, you schedule a meeting with Steven Serino, Quest's CFO. Mr. Serino stresses Quest's conservative management philosophy and warns against "speculation." He also reiterates his hope that the fixed income portfolio will grow to cover most of the obligations shown in Exhibit 1. Mr. Serino complains about the performance of the previous fixed-income portfolio manager. Exhibit 4 plots this performance from 1997 to 2002, and compares it to the Lehman Brothers aggregate fixed-income index.

You should construct a new portfolio from the "universe" of securities listed in Exhibit 3 that best meets Mr. Serino's goals. You are free to sell any of the securities in Quest's existing fixed-income portfolio. Instructions for obtaining price quotes and other information on these securities will be given in tutorial sessions.

Please submit your portfolio on Friday, October 17, 2003, before 4 p.m. The securities you select will be purchased at closing (asked) market prices on that date.⁴ There will be several

³ Quest is not worried about the retirement benefits of current employees. It hopes to cover retirement benefits for current employees with the \$16 million equity portfolio, supplemented by future contributions to the pension fund.

⁴ *Asked* prices are higher than *bid* prices. When you buy from a fixed-income securities dealer, you pay the asked price. If you then resell the security, you get the dealer's lower bid price. The dealer's profit comes from the *bid-ask spread*.

opportunities later to trade to revise the portfolio. A description of trading procedures and constraints will be given in the tutorial sessions.

Along with your portfolio, please submit a brief (two-page) report addressed to Mr. Serino that explains your investment strategy and the initial composition of the fixed-income portfolio. Submit this report by Friday, October 17, 2003, before 4 p.m. Attach a printout of your starting portfolio (securities chosen and amount invested in each) to this report.

Exhibit 1

Quest's Pension Fund

Fixed income portfolio as on September 19, 2003

| <u>Type</u> | <u>CUSIP</u> | <u>Description</u> | <u>Coupon</u> | <u>Maturity</u> | <u>Par Position</u> | <u>Market Value</u> |
|--------------|--------------|--------------------|---------------|-----------------|---------------------|---------------------|
| Cash | | | | | 4,500,000 | \$ 4,500,000.00 |
| Treasuries | 912828BC3 | 1.75yr TNote | 1.125 | 6/30/2005 | 10,000,000 | \$ 9,931,250.00 |
| Treasuries | 912828BA7 | 9.63yr TBond | 3.625 | 5/15/2013 | 9,900,000 | \$ 9,545,765.63 |
| Treasuries | 912810EQ7 | 19.89yr TBond | 6.25 | 8/15/2023 | 12,500,000 | \$ 14,242,187.50 |
| Strips | 912833JV3 | 7.13yr STRIPS | - | 11/15/2010 | 14,300,000 | \$ 10,802,085.94 |
| Strips | 912803CG6 | 25.9yr STRIPS | - | 8/15/2029 | 23,000,000 | \$ 5,570,312.50 |
| TIPS | 9128272M3 | 3.3yr TIPS | 3 3/8 | 1/15/2007 | 5,800,000 | \$ 6,317,468.75 |
| Corporates | 001669AK6 | 7.35yr AEN Bond | 9.5 | 2/1/2011 | 5,600,000 | \$ 5,915,002.80 |
| Corporates | 459200AS0 | 24.31yr IBM Bond | 6.5 | 1/15/2028 | 5,600,000 | \$ 5,936,000.00 |
| Corporates | 607059AT9 | 17.89yr XOM Bond | 8.625 | 8/15/2021 | 4,900,000 | \$ 6,174,000.00 |
| Corporates | 94975ZAB2 | 4.43yr WFC Bond | 6.08 | 3/3/2008 | 4,900,000 | \$ 5,254,627.70 |
| TOTAL | | | | | | \$ 84,188,700.81 |

Exhibit 2

Quest's Pension Fund

Projected Benefits for Retired Employees

| <u>Year</u> | <u>Benefits (millions)</u> |
|-------------|----------------------------|
| 11/15/2004 | 9.36 |
| 11/15/2005 | 9.01 |
| 11/15/2006 | 8.68 |
| 11/15/2007 | 8.36 |
| 11/15/2008 | 8.05 |
| 11/15/2009 | 7.75 |
| 11/15/2010 | 7.46 |
| 11/15/2011 | 7.19 |
| 11/15/2012 | 6.92 |
| 11/15/2013 | 6.67 |
| 11/15/2014 | 6.42 |
| 11/15/2015 | 6.18 |
| 11/15/2016 | 5.96 |
| 11/15/2017 | 5.73 |
| 11/15/2018 | 5.52 |
| 11/15/2019 | 5.32 |
| 11/15/2020 | 5.12 |
| 11/15/2021 | 4.93 |
| 11/15/2022 | 4.75 |
| 11/15/2023 | 4.57 |
| 11/15/2024 | 4.40 |
| 11/15/2025 | 4.24 |
| Total | <u>\$142.59 million</u> |

Exhibit 3

Quest's Pension fund

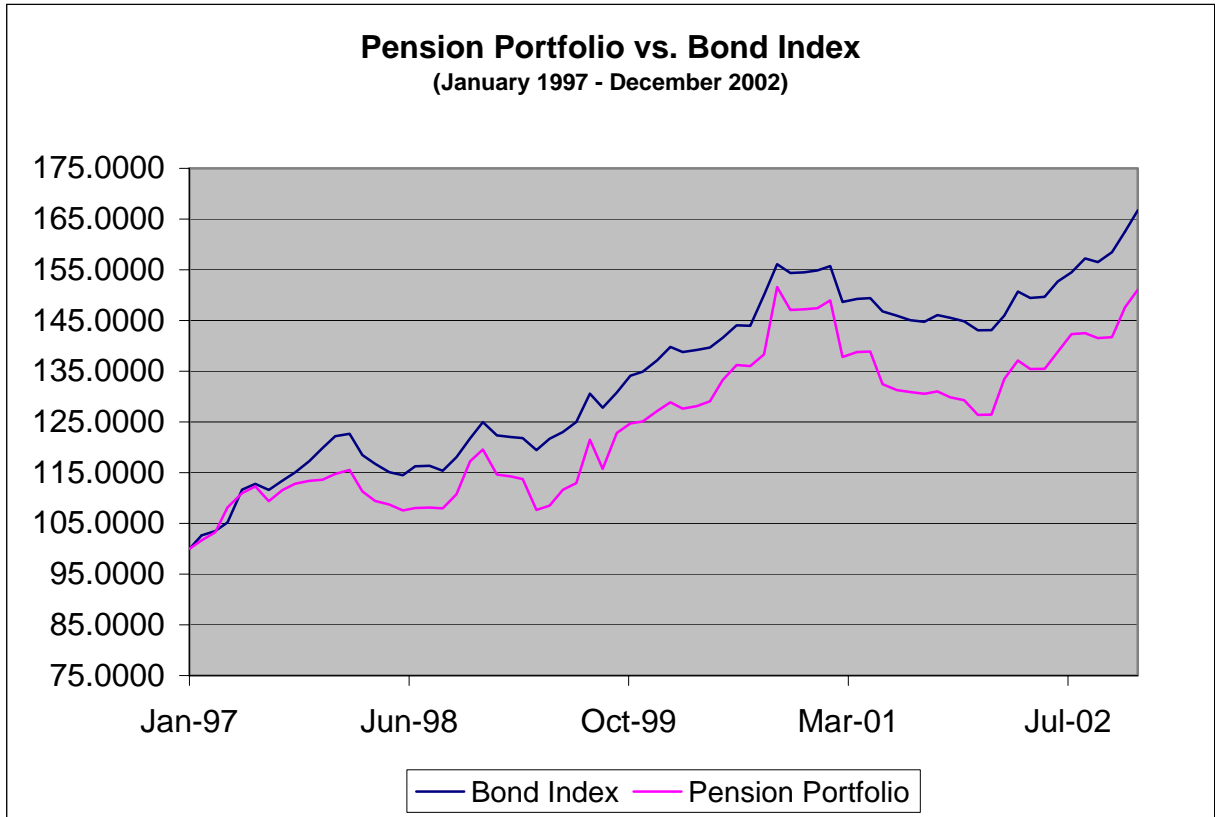
Fixed-Income Securities Available for Purchase

| <u>Type</u> | <u>CUSIP</u> | <u>Desc</u> | <u>Cpn</u> | <u>Maturity</u> |
|-------------|--------------|--------------------|------------|-----------------|
| Treasuries | 912795PC9 | 3mth TBill* | - | 12/26/2003 |
| Treasuries | 912795PR6 | 6mth TBill | - | 3/25/2004 |
| Treasuries | 912828AL4 | 1yr TNote* | 1.875 | 9/30/2004 |
| Treasuries | 912828BC3 | 1.75yr TNote* | 1.125 | 6/30/2005 |
| Treasuries | 912828AZ3 | 4.63yr TNote* | 2.625 | 5/15/2008 |
| Treasuries | 912828BA7 | 9.63yr TBond | 3.625 | 5/15/2013 |
| Treasuries | 912810DW5 | 12.64yr TBond* | 7.25 | 5/16/2016 |
| Treasuries | 912810EQ7 | 19.89yr TBond* | 6.25 | 8/15/2023 |
| Treasuries | 912810FF0 | 25.15yr TBond* | 5.25 | 11/15/2028 |
| Treasuries | 912810FP8 | 27.40yr TBond | 5.375 | 2/15/2031 |
| STRIPS | 912833FZ8 | 3.13yr STRIPS | - | 11/15/2006 |
| STRIPS | 912833JV3 | 7.13yr STRIPS | - | 11/15/2010 |
| STRIPS | 912833KP4 | 14.14yr STRIPS | - | 11/15/2017 |
| STRIPS | 912833KX7 | 16.14yr STRIPS | - | 11/15/2019 |
| STRIPS | 912833PB0 | 23.15yr STRIPS | - | 11/15/2026 |
| STRIPS | 912803CG6 | 25.9yr STRIPS | - | 8/15/2029 |
| TIPS | 9128272M3 | 3.3yr TIPS | 3.375 | 1/15/2007 |
| Agencies | 3136F3RL2 | 9.67yr FNMA | 4.0 | 5/28/2013 |
| Corporates | 001669AK6 | 7.35yr AEN Bond | 9.5 | 2/1/2011 |
| Corporates | 887315AX7 | 3.88yr AOL Bond | 8.18 | 8/15/2007 |
| Corporates | 001957AQ2 | 21.31yr ATT Bond | 8.35 | 1/15/2025 |
| Corporates | 370334AM6 | 9.88yr GIS Bond | 0 | 8/15/2013 |
| Corporates | XS0094175758 | 0.35yr G Bond | 3.25 | 2/2/2004 |
| Corporates | 459200AS0 | 24.31yr IBM Bond | 6.5 | 1/15/2028 |
| Corporates | 607059AT9 | 17.89yr XOM Bond | 8.625 | 8/15/2021 |
| Corporates | 76182KAH8 | 9.88yr RJR Bond | 9.25 | 8/15/2013 |
| Corporates | 897907AA9 | 2.59yr TRUATL Bond | 11.25 | 5/1/2006 |
| Corporates | 94975ZAB2 | 4.43yr WFC Bond | 6.08 | 3/3/2008 |

**These Treasury Securities are not current issues (i.e. they are off-the-run).*

Exhibit 4

Quest's Fixed-Income Portfolio Performance, 1997-2002



Background and Procedures

Purpose of Assignment

Introduction to:

1. Fixed-income securities, including pricing conventions, calculation of yields, bid-ask spreads
2. The business of institutional money management
3. The term structure of interest rates
4. Duration and interest rate risk
5. Inflation and fixed-income yields
6. Credit risk

Preparing the assignment

Enter your portfolio trades (sales/purchases) electronically, through the 15.407 website, before 4 p.m. on October 17, 2003. Your trades will be executed at the closing prices. Trades submitted after the 4 p.m. deadline will not be executed.

Submit your group's report, with a printout of your portfolio, by 4 p.m. on October 17, 2003.

You can update your portfolio each week -- more details later.

Some Trading Constraints

1. No short sales allowed. (Any short positions will be closed out at ask prices.)
2. No borrowing allowed. If you try to buy more than your portfolio's market value, your group will be penalized 10% per month on the excess.
3. Any "cash" not invested in other securities will be automatically invested at the 3-month Treasury bill rate.
4. You must trade all bonds in increments of \$10,000 par value.