The Influence Of Pension Obligations And Other Postretirement Benefits On Primary Bond Pricing

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Abstract

This paper investigates alternative measures of pension obligations and other postretirement benefits in an effort to assess their incremental value in determining risk premia of primary market corporate bonds. The results indicate that the information pertaining to pension liabilities (SFAS 87), and presented on the balance sheet, have no observable impact upon the firm’s primary market bond yields beyond that impounded in the firm’s bond rating. However, the information pertaining to other postretirement benefits (SFAS 81), and required in the footnotes to the financial statements, is found to be related to higher risk premia.

Introduction

There has been considerable interest regarding the effect that pensions and other postretirement benefits have on the evaluation of a firm as reflected by the financial markets. Pronouncements from the Financial Accounting Standards Board (FASB) require corporations to accrue the cost of any pension liability (SFAS 87 Employers’ Accounting for Pensions 1985) and other postretirement benefits (SFAS 106 Employers’ Accounting for Postretirement Benefits Other Than Pensions 1990) and present any resulting liability on the balance sheet. SFAS 87 pertains to liabilities associated with a corporate sponsored defined benefit pension plan. SFAS 106 relates to other postretirement benefits (primarily health care and life insurance) that corporations promise their workers when they retire from active employment. The result for many corporations has been an increase in reported earnings volatility as well as a dramatic increase in the total amount of corporate obligations for employee benefits presented in the financial statements.

While there remains considerable controversy regarding the proper measurement of these liabilities, accurate measurement is critical to precise financial assessment of an individual firm. Indeed, the magnitude of these liabilities is massive. The Pension Benefit Guarantee Corporation estimated the unfunded pension liability for the 50 most underfunded companies in the U.S. to exceed $38 billion in 1992 (WSJ, 1993).

Readers with comments or questions are encouraged to contact the authors via e-mail.
The General Accounting Office estimated the total U.S. corporate unfunded other postretirement benefits obligation in 1993 to be $412 billion (Geisel, 1993). Given the long time-horizon behind these obligations and the necessity of making several critical assumptions, a number of legitimate measures of the pension liability and other postretirement benefits (OPEB) obligation are possible. The FASB, in SFAS 87, requires balance sheet presentation of a minimum net pension liability, but also requires disclosure of a number of alternative pension measures in the footnotes to the financial statements. At the outset, SFAS 106 requires recognition of a relatively small OPEB liability on the corporate balance sheet, but requires footnote presentation of the larger overall other postretirement benefit obligation. The FASB policy of "booking" one liability measure while presenting alternative measures in the required corporate footnotes is indicative of the measurement uncertainty that exists in the employee benefit obligation area.

The research presented here employs primary bond pricing data to provide a market-based investigation into these required measures of financial exposure. If investors use this newly required information in assessing the riskiness of the bond issues of corporations, additional risk premia should be identifiable in the pricing of primary corporate bond issues. Obtaining a better understanding of which, if any, of these measures allows identification of additional risk premia should provide accounting policy-makers with empirical evidence regarding actual market perceptions of these obligations. However, the paper considers the possibility that any incremental risk characteristics associated with these long term liabilities are captured in the default risk ratings provided by the major ratings agencies and therefore are not obvious in primary bond yields.

Another goal of this research is to provide additional insight into the relative value of information actually "booked" in the financial statements relative to information disclosed in the footnotes. This evidence should be helpful in future deliberations and financial reporting developments in accounting for employee benefits as well as for other information.

The next section of this paper discusses the background of the reporting requirements associated with disclosure of postretirement employee benefits. Sections III and IV present a brief review of the literature and describe the methodology and data collection. The final two sections present the results and discuss their implications.

Background

The formal accounting standards concerning financial statement disclosure of employee benefits have been evolving for more than three decades. This evolution has coincided with a more detailed knowledge and understanding of the dynamics affecting the relationship between firm valuation and employee benefit obligations. The first formalized recognition of a firm's periodic pension cost in the main body of the financial statements was required by Accounting Principles Board (APB) #8 in 1966. Basically, APB #8 required liability recognition for only the difference between pension expense and pension funding. This was eventually augmented by SFAS 36 in 1980 to include additional disclosures regarding the present value of the pension obligation as well as the fair value of any pension assets. Ultimately, this was superseded by SFAS 87 which prescribed comprehensive procedures for companies to follow regarding pension accounting. The result of SFAS 87 was a movement toward standardization of the methods used by all companies (including actuarial cost method and interest discount rates) in presenting pension information in the financial statements. However, the FASB recognizes that SFAS 87 is not the final chapter and acknowledges "This Statement continues the evolutionary search for more meaningful and more useful pension accounting. Pension accounting is still in a transitional stage. It has not yet fully crystallized" (SFAS 87, para. 5).

The presentation of accounting information regarding a firm's other postretirement bene-
fits obligation is also undergoing an evolutionary process. The first information required to be presented in a firm's financial statements specifically regarding OPEBs was the result of SFAS 81 issued in 1984, *Postretirement Health Care and Life Insurance Benefits*. SFAS 81 required footnote disclosures describing the benefits provided, the current accounting policies for those benefits, and the cost of those benefits recognized in the current period. The FASB issued SFAS 81 as an interim measure recognizing that a great deal more information and disclosure was necessary for investors regarding the postretirement benefits obligation.

In the late 1980s, subsequent to the issuance of SFAS 81, the accounting and financial reporting communities looked more deeply into the issues involved in measuring and presenting the postretirement benefits obligation. Cooper's and Lybrand, one of the "Big Six" accounting firms, was directly involved in conducting a field test of the FASB's Exposure Draft #78, *Employers' Accounting for Postretirement Benefits Other Than Pensions*. This field test, sponsored by the Financial Executives Research Foundation (FERF), is considered the most comprehensive investigation of postretirement benefits completed during this time period. The results of this field test reveal that many of the companies had difficulty in readily obtaining all the necessary data. The required data included a detailed description of each employee benefit plan along with the actual medical payment records for individual employees. Obtaining an estimate of the postretirement medical benefit obligation involved analyzing the employee population along with the promised benefits. Inputs that influenced the results included some unusual situations. An example is an employee who took early retirement at age 60 while he had a 30 year old wife and two young children. If the company's medical retirement plan includes spousal coverage, the obligation associated with this particular employee could continue for more than 50 years. The result of the overall field test process was a better understanding of the magnitude of the obligation, as well as a more clearly defined perception of what was necessary for companies to develop their own obligation estimates.

It became evident to the FASB that for some companies this postretirement benefit obligation represented an enormous liability that should be displayed to financial statement users. It was also evident that many companies would need substantial time to allow their information systems to be sufficiently developed to track and accumulate the necessary data. The FASB released SFAS 106, *Employers' Accounting for Postretirement Benefits Other than Pensions*, in 1990. SFAS 106 requires companies to report detailed information in their financial statements regarding other postretirement benefits starting for fiscal years ending in 1993. Interestingly, the FASB did not require immediate balance sheet recognition of the full postretirement benefit obligation. Rather, it allowed companies to gradually recognize this liability over time (up to 20 years), while disclosing the full unfunded obligation amount in the footnotes of the financial statements.

At this point, it may be useful to review the similarities and differences that exist between OPEBs and pensions. They are both considered forms of deferred compensation to be accrued during the working life of the employee and paid after the retirement date. Also, they both represent substantial future obligations whose present value measurement depends critically upon the chosen actuarial assumptions.

There are a number of fundamental differences between pensions and OPEBs. Unlike defined benefit pensions, the timing and amount of the future OPEB payments are unknown and difficult to predict even with actuarial techniques. Part of the reason for this is that some of the variables that determine future costs are beyond the direct control of the corporation. These include such items as the employee utilization rate and the health care inflation rate. Another substantive difference between pensions and OPEBs is the effect of early retirements. The monthly pension benefit is reduced when an employee retires early (e.g., at age 55), so that the end-cost to the company is actuarially equivalent.
Conversely, the present value of the retiree medical benefits will increase significantly if the employee retires before age 65. The manner in which pensions and OPEBs incorporate inflation is also quite different. Most private pension plans are not automatically indexed for cost of living increases. However, retiree health benefits are effectively fully indexed since most plans define benefits in terms of services and not the cost of these services. The effect of this is to automatically increase employer costs with medical cost inflation.

Another substantive difference between these obligations concerns corresponding assets. Most firms have transferred substantial pension plan assets to third party trustees to take advantage of the tax advantages of pre-funding. These assets are often equal to, or greater than, the full present value of the pension liability. There is little to no tax advantage to corporations for pre-funding their OPEB liability at this point in time. Consequently, the vast majority of corporations do not have any assets set aside for their OPEB obligation.

Previous Research

A. Postretirement Liabilities

There has not been a great deal of empirical research published in the postretirement benefits area. The Cooper’s and Lybrand field test of FASB Exposure Draft #78 was published in 1989 (FERF, 1989). This document, described earlier, continues to be one of the most detailed descriptive studies available on estimating postretirement benefits. The Employee Benefit Research Institute produced a study (1988) on measuring and funding corporate retiree health benefits, but it was not directly related to the FASB proposal. A study conducted by Harper et al. (1991) indicates commercial lenders treat the unfunded postretirement benefits more like corporate debt if it is given balance sheet recognition than if it is merely disclosed in the footnotes of the financial statements. Warshawsky et al., (1993) provide a descriptive look at the level and extent of postretirement benefits for a large sample of firms. Inder and Louder (1994) examined the effect on investors of the announcement of SFAS 106 and found that share prices of unregulated firms declined while those of rate-regulated firms did not decline.

Espahbodi et al. (1991) examined the impact on equity prices of nine pronouncements related to the proposed accounting for other postretirement benefits. The authors found significant negative abnormal returns for companies exhibiting certain characteristics such as low retiree to active employee ratio, high debt ratios, and small relative firm size.

Mittelstaedt and Warshawsky (1993) and Amir (1993) investigated the impact of retiree health benefit liabilities on share prices. Using equity price valuation models, each study found that investors appear to be making estimates of the postretirement benefits liability and incorporating this information into the pricing of individual securities. These studies found that derived liability estimates provide additional information beyond the yearly cash expense for postretirement benefits. Mittelstaedt and Warshawsky also provided some evidence that indicates one dollar of postretirement benefit liability affects share prices less than one dollar of other firm liabilities.

A number of studies have examined pension measures with respect to the equity market value of a firm. It has been shown that a common average interest rate is more useful when evaluating pension liabilities (Feldstein and Morck, 1983). The tax adjusted pension expense variable appears to be the more useful measure when impounding future pension costs (Daley, 1984). Pension assets and liabilities are basically valued by the stock market as corporate assets and liabilities (Landsman, 1986). Unfunded vested pension liabilities are essentially treated as long term debt (Dhaliwal, 1986). Barth (1991) examined a variety of pension asset and liability measures with respect to firm market value and determined that the footnote disclosures are closer to those assessed in market valuations than are the measures recognized in the balance sheet.
Barth et al., (1992) found that equity market participants implicitly treat the coefficients of pension cost components differently when determining security prices. In addition to this evidence, there is debate with regard to the efficiency of the market in its impounding of the pension liability as disclosed in footnotes (Durkee et al., 1988; Stone, 1988; Landsman and Ohlson, 1990; Pastena, 1990), as well as bank analysts' perceptions of these pension disclosures (Harper et al., 1987). A great deal of research has concentrated on those factors leading firms to terminate their defined benefit pension plans (Stone, 1987; Mittelstaedt, 1989; Thomas, 1989) as well as the market's reaction to termination of pension plans (Hsieh et al., 1990; Mittelstaedt and Regier, 1993; Hsieh and Ferris, 1994).

The relationship between pension liabilities and corporate bond ratings was examined by Martin and Henderson (1983) who determined that measures of pension liability were able to increase the classification accuracy of their base model. Maher (1987) examined various pre-SFAS 87 pension measures to determine that measures developed using standardized interest discount rates are important factors in the bond rating decision. Maher and Ketz (1993) utilized SFAS 87 prescribed measures and determined that the Accumulated Benefits Obligation (ABO) pension measure is most consistent with the default risk associated with a firm's bonds.

B. Bond Pricing

Beginning with Fisher's ground breaking work in 1959, there have been numerous studies investigating the primary pricing of bonds. A reasonably large body of literature has been developed in the broadly defined area of bond pricing. In the corporate arena these studies have investigated a variety of issues including the method of underwriting (Sorensen (1979)), the influence of changes in registration requirements (Kidwell, Marr, and Thompson (1984) and Rogowski and Sorensen (1985)), and the value of call and refunding protection (Thatcher (1985) and Allen, Lamy, and Thompson (1989)). These models have also been applied to securities other than straight corporate debt. As examples, municipal bond pricing (Benson, Kidwel, Koch, and Rogowski (1981)), and the pricing of convertible corporate bonds (Marr and Thompson (1984) and Billingsley, Lamy, and Thompson (1986)) have also been considered using the modeling techniques presented in this paper.

Those researchers working in the bond pricing literature have been alert for improved methods of risk measurement as well as new variables that will help to more precisely explain the resulting price of a firm's bonds in the primary market. This paper extends this literature by including various measures of pension obligations and other postretirement obligations in the bond pricing model.

Methodology

A. Bond Pricing Equation

The methodology employed in this paper is an application of the primary market bond pricing model with the addition of alternative measures of pension and other postretirement benefits obligations. This specification of the model leads to a joint test. That is, these obligations may, or may not, be judged significant to those investors who purchase primary market bonds. Further, if investors who purchase primary market bonds deem these postretirement obligations to add significant risk, the rating agencies may, or may not, fully capture that risk in the publicly available ratings of these securities. Finding significant results in the bond pricing equation should indicate that primary bond buyers deem these postretirement obligations important, and that the publicly available ratings do not completely capture the risk implications of these obligations.

The form of the bond pricing model used is that presented in Allen, Lamy, and Thompson (1990). This model uses the relative yield spread as the dependent variable and prices that yield spread according to the following:
\[ RY_i = f(RATING, INTVOL, SIZE, CALLPRO, REFPRO, SINK) \]

Where:

\( RY_i \) = relative yield spread calculated as yield to maturity on issue \( i \) minus the yield to maturity of the constant maturity U.S. Treasury bond index with the same maturity on the date of issue, divided by the yield on the constant maturity U.S. Treasury bond index with the same maturity on the date of issue;

\( RATING \) = the Moody's Investors Service bond rating, entered into the equation as a series of zero-one variables (Ba and lower rated issues serve as the reference group, or excluded set)\(^2\),

\( INTVOL \) = volatility in interest rates computed as the previous ten days' (from issue date) mean absolute deviation in the 20 year constant maturity U.S. Treasury Bond index;

\( SIZE \) = the natural log of the size of the issue;

\( CALLPRO \) = the ratio of years to call divided by the years to maturity. This is a continuous variable bounded by zero, no call protection, and one, protected from call until maturity;

\( REFPRO \) = the ratio of years to refunding divided by the years to maturity. This is a continuous variable bounded by zero, no refunding protection, and one, protected from refunding until maturity; and

\( SINK \) = the ratio of years to the start of a sinking fund divided by the years to maturity. This is a continuous variable bounded by zero, an immediate sinking fund, and one, no sinking fund.

The publication associated with this variable are mixed. While some authors have found this variable to reflect the predicted positive estimated coefficient, others have failed to find the variable to be significantly different from zero.\(^3\)

The natural log of the size of the issue is included in the specification of the model. This specification of the size variable is consistent with the majority of previous papers. The explanation for the use of the natural log of the size of the issue is that as an issue becomes larger, the market becomes broader and the issue therefore becomes more attractive as an addition to the investor's portfolio. However, the attractiveness of the size of a issue is limited and as the issue becomes extremely large, yields must be adjusted upward to sell the entire issue. Previous papers have found a negative estimated coefficient using this specification and the expectation here is for a negative estimated coefficient.

The next two variables are specified in terms relative to the maturity of the issue. That is, the years until the issue can be called is divided by the number of years to maturity to develop the call protection variable, \( CALLPRO \). Likewise, the number of years until the issue can be refunded is divided by the number of years to maturity to develop the refunding protection variable, \( REFPRO \). The theoretical expectation is that longer periods of protection from the issuing firm's ability to exercise an option should be attractive to investors and the model should therefore yield negative estimated coefficients for these two variables. Therefore, the expectation is that these variables should display negative estimated coefficients. However, the results in the literature have been mixed for these two variables.\(^4\) The most practical explanation for these variables' failure to display significant estimated coefficients in the current literature is that the publicly available ratings capture the risks associated with call and refunding by the issuing firm.

The final variable in the base model is a measure of the sinking fund characteristics of the
issue. This characteristic of a bond issue offers mixed theoretical expectations. That is, a sinking fund makes an issue less risky through the process of decreasing the total exposure of the firm over the life of the issue and decreasing what has come to be called "crisis at maturity." However, the investor is exposed to the possibility of a sinking fund call, an option held by the issuing firm. The implications of these two aspects of a sinking fund are useful in explaining the often insignificant results when estimating the coefficient of a sinking fund variable. When one adds to the mixed theoretical implications the possibility that the risk impact associated with a sinking fund could be fully captured in the publicly available ratings, inconsistent results may actually become the expectation.\(^5\)

Various measures of the pension obligation as well as other postretirement benefits obligations (OPEBs) are inserted into the model as additional independent variables. The pension measures are developed from those items prescribed by SFAS 87. The OPEB variables are derived from footnote disclosures required by SFAS 81. In addition to the traditional pension measures, the pension assets and pension liabilities are segregated to produce two independent variables.

**B. Data**

The sample was developed from new issues of corporate debt over the period January 1, 1986 to December 31, 1990.\(^6\) The issue specific variables were obtained from Moody's Bond Survey. The U.S. Treasury rate variable is from the *Federal Reserve Statistical Release H.15: Selected Interest Rates*. The data necessary to develop the pension liability measures were drawn from the Compustat files. The information necessary to determine the OPEB obligations of the issuing firms was collected from the annual reports of the firms.\(^7\) The original sample of 672 bond issues identified in Moody's Bond Survey was reduced to 174 by the requirements of necessary data availability for the issuing firms. This requires they be listed on Compustat and that annual reports be available.

**C. Specification of Unique Independent Variables**

Detailed definitions for the pension and OPEB variables are listed in Table 1 along with the descriptive statistics for each of these independent variables. Before entering each of these variables into the bond pricing equations each is adjusted by dividing by the current (most recently released annual report at time of the bond issue) value of the firm's assets. This adjustment is required to account for the significant variation in firm size as displayed by the total assets reported in Table 1. OPEBEXP is the first other postretirement benefits measure tested in the estimating equation. As described above, this variable is constructed by dividing the firm's yearly expenses for other postretirement benefits by total assets. The second other postretirement benefits measure (OPEBLIB) is developed by dividing the yearly OPEB expense by the interest rate the company used to discount its pension obligations to the present. This calculation assumes that the current yearly OPEB expense represents a perpetuity. Once again, to adjust for the variant firm sizes in the sample, the resultant liability is divided by assets. A third liability measure (OPEBAVG) is developed in a manner similar to the second, except that the current yearly expense for postretirement benefits is divided by the sample average pension interest discount rate for that particular year. Following the work of Feldstein and More (1983), this should help intercompany comparability by mitigating the effects of a company that uses a particularly high or low interest rate for discounting its pension obligation.

Each of the two SFAS 87 prescribed measures of the pension obligation contains two fields on the Compustat file. One field is the accumulation for its overfunded plans, the other is the accumulation for its underfunded plans. The first pension liability measure (NETPENABO) adds the Accumulated Benefit Obligation fields, subtracts the Pension Plan Assets fields, and divides by the firm's total assets. Because NETPENABO is a "net" pension measure, and because investors may assess pension obligations and assets differently, a second measure is
tested. This measure is actually two variables. The first variable is developed by grouping the overfunded and underfunded Accumulated Benefits Obligation fields divided by the firm's total assets for the liability measure (ABOLIB), and the second is computed by adding the two pension plan assets fields divided by the firm's total assets to attain the asset measure (PENASSET).

It is interesting to observe from Table 1 that the net pension accumulated benefit obligation (NETPENABO) for this sample of firms is negative. That is, these firms, on average, have over-funded their pension obligations. While there is wide distribution of the obligation as illustrated by the standard deviation of this measure, these firms, on average, have an asset instead of a liability associated with their pension obligations. This observation may well influence the results of the empirical analysis presented in the following section of the paper.

**Table 1**

**Detailed Definitions and Descriptive Statistics of Other Postretirement Benefits and Pension Variables**

**Panel A: Descriptive Statistics ($ millions)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Median</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTASSETS</td>
<td>$6,360.00</td>
<td>$694.57</td>
<td>$15,643.11</td>
</tr>
<tr>
<td>OPEB 5.05</td>
<td>29.66</td>
<td>87.56</td>
<td></td>
</tr>
<tr>
<td>OPEBLIB</td>
<td>60.00</td>
<td>315.47</td>
<td>869.47</td>
</tr>
<tr>
<td>OPEBAVG</td>
<td>56.77</td>
<td>333.92</td>
<td>986.49</td>
</tr>
<tr>
<td>ABOLIB</td>
<td>412.50</td>
<td>1,526.36</td>
<td>2,896.04</td>
</tr>
<tr>
<td>PENASSET</td>
<td>676.50</td>
<td>2,137.46</td>
<td>3,550.43</td>
</tr>
<tr>
<td>NETPENABO</td>
<td>(176.50)</td>
<td>(611.10)</td>
<td>1,105.54</td>
</tr>
<tr>
<td>INTRATE</td>
<td>9.00%</td>
<td>8.80%</td>
<td>0.63%</td>
</tr>
</tbody>
</table>

**Note:** The postretirement benefit variables used in the regression models are all divided by each firm's total assets.

**Panel B: Variable Definitions**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTASSETS</td>
<td>Total Assets for a company.</td>
</tr>
<tr>
<td>OPEB</td>
<td>Yearly expense for a firm's other postretirement benefits.</td>
</tr>
<tr>
<td>INTRATE</td>
<td>Interest rate used to discount the firm's pension obligation to the present.</td>
</tr>
<tr>
<td>OPEBLIB</td>
<td>(OPEB/INTRATE)</td>
</tr>
<tr>
<td>OPEBAVG</td>
<td>(OPEB/average interest rate for sample in that year)</td>
</tr>
<tr>
<td>ABOOVER</td>
<td>Accumulated Benefit Obligation for a firm's Overfunded pension plans.</td>
</tr>
<tr>
<td>ABOUNDER</td>
<td>Accumulated Benefit Obligation for a firm's Underfunded pension plans.</td>
</tr>
<tr>
<td>PPAOVER</td>
<td>Fair market value of firm's pension assets for its Overfunded plans.</td>
</tr>
<tr>
<td>PPAUNDER</td>
<td>Fair market value of firm's pension assets for its Underfunded plans.</td>
</tr>
<tr>
<td>ABOLIB</td>
<td>(ABOOVER + ABOUNDER)</td>
</tr>
<tr>
<td>PENASSET</td>
<td>(PPAOVER + PPAUNDER)</td>
</tr>
<tr>
<td>NETPENABO</td>
<td>((ABOOVER - PPAOVER) + (ABOUNDER - PPAUNDER))</td>
</tr>
</tbody>
</table>

*The results (shown in Table 2) indicate that the base model performs as expected. Each of the ratings variables and the size variable have significant estimated coefficients that reflect the theoretically expected coefficients. The sinking fund variable also displays a negative and significant estimated coefficient for this sample. This result is consistent with the argument that the sinking fund is viewed by investors as a risk reducing characteristic. The statistical measures of performance for the model are not unlike those in previously published papers.*

Also presented in Table 2 are the results of adding the various OPEB and pension variables
Table 2
Regression Results: Various Models

The estimated equation is: \( R_Y = f(RATING, INTVOL, SIZE, CALLPRO, REFPRO, SINK, POST) \)

where \( R_Y \) = relative yield spread calculated as yield to maturity on issue i minus the yield to maturity of the constant maturity U.S. Treasury bond index with the same maturity on the date of issue, divided by the yield on the constant maturity U.S. Treasury bond index with the same maturity on the date of issue; \( RATING = \) the Moody's Investors Service bond rating, entered into the equation as a series of zero-one variables (Ba and lower rated issues serve as the reference group, or excluded set); \( INTVOL \) = volatility in interest rates computed as the previous ten days' (from issue date) mean absolute deviation in the 20 year constant maturity U.S. Treasury Bond index; \( REFPRO \) = the ratio of years to refunding divided by the years to maturity. This is a continuous variable bounded by zero, no refunding protection, and one, protected from refunding until maturity; \( CALLPRO \) = the ratio of years to call divided by the years to maturity. This is a continuous variable bounded by zero, no call protection, and one, protected from call until maturity; \( SINK \) = the ratio of years to the start of a sinking fund divided by the years to maturity. This is a continuous variable bounded by zero, an immediate sinking fund, and one, no sinking fund; \( SIZE \) = the natural log of the size of the issue; and \( POST \) = specific postemployment obligation variables as follows: \( OPEBEXP = OPEB/TOTASSETS; OPEBLIB = (OPEB/INTRATE)/TOTASSETS; OPEBAVG = (OPEB/average interest rate for sample in that year)/TOTASSETS; ABOLIB = (ABOOVER + ABOUNDER)/TOTASSETS; PENASSET = (PPAOVER + PPAUNDER)/TOTASSETS; NETPENABO = ((ABOOVER - PPAOVER) + (ABOUNDER - PPAUNDER))/TOTASSETS

<table>
<thead>
<tr>
<th>Base Model</th>
<th>OPEBEXP</th>
<th>OPEBLIB</th>
<th>OPEBAVG</th>
<th>NETPENABO</th>
<th>ABOLIB</th>
<th>PENASSET</th>
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<td>Constant</td>
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<td>0.8120</td>
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<td>AAA</td>
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<tr>
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<tr>
<td>A</td>
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<td>-0.3999</td>
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<td></td>
<td>(.0001)</td>
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<td>BAA</td>
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<td>-0.3413</td>
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</tr>
<tr>
<td></td>
<td>(.0001)</td>
<td>(.0001)</td>
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<td>(.0001)</td>
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</tr>
<tr>
<td>INTVOL</td>
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<td>1.1788</td>
<td>1.2027</td>
<td>1.1520</td>
<td>1.8165</td>
<td>1.8256</td>
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<td></td>
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(probability values are in parentheses)
to the equation. The OPEB variable that is based upon current yearly OPEB expense, OPEBEXP, reflects a positive and significant estimated coefficient (prob. = .0053). When the liability is measured using an estimate of the capitalized value of expected OPEB expenses, the resultant estimated coefficient continues to reflect a positive and significant estimated coefficient. This result does not appear to be sensitive to the capitalization rate, as illustrated by the similarity between the estimated coefficients and levels of significance of the OPEBLIB and OPEBAVG variables.

With respect to pension obligations, the results displayed in Table 2 illustrate that the Accumulated Benefit Obligation (NETPENABO) does not display a significant estimated coefficient. Further, allowing this information to enter the equation in two separate variables, measuring pension liabilities (ABOLIB) and pension assets (PENASSET) independently, fails to display a significant relationship.

These results are consistent with the belief that the primary importance of the available pension information in the bond pricing decision is captured in the issue's bond rating. This is reasonable given that SFAS 87 was issued in 1985 and prescribed detailed procedures to appropriately measure the firm's pension obligation. This information has been available for some time to both bond raters and bond market participants. Further, the evidence is that bond raters interpret this information in a manner consistent with the activities of the bond market.

A second possibility also exists with regard to the estimated coefficients of the pension variables. That is, given that the average firm in the sample has over-funded its pension liabilities, on average, there may not be sufficient risk for these firms to display significant estimated coefficients.

The same arguments cannot be made with regard to other postretirement benefits. The estimated coefficients indicate that there is additional information, beyond any that may be captured in the bond rating, that can be found in the other postretirement benefits information. This is empirically demonstrated by the significance of the estimated coefficients in the bond pricing model.

**Discussion and Conclusions**

This result of finding the OPEB variables significant while finding no significance with the pension variables may be consistent with more that one explanation. First, it may well be due to the more well defined nature and acceptance of the pension information presented in the financial statements. Pension information has been required to be presented in one form or another since 1966. Over this period there has been clarification and refinement of critical measurement issues along with narrowing of plan assumptions. These events have likely resulted in substantial agreement by both bond rating analysts and the primary issue market regarding pension obligation measurement and its effect on the risk level of bonds. A second explanation is that, on average, the firms in the sample have more pension assets than pension liabilities. This leads to the possibility that those firms with pension liabilities are "overpowered" by those that are overfunded.

These results indicate that participants in the primary market assess additional risk premia to new bond issues from firms that have substantial other postretirement benefits. These higher risk premia are in addition to any explained by the issues' publicly available bond ratings. These research findings support the conclusion that postretirement benefit obligations are considered significant to investors who purchase primary market bonds, and that the rating agencies do not fully capture the additional risk implications of these obligations. Interestingly, during the period of this sample, the information necessary to evaluate the firm's exposure to other postretirement benefits is available only in the financial statement footnotes. This finding is consistent with Barth (1991) who reported that equity market values do reflect footnote disclosures.
As further explanation of this divergent finding between pensions and OPEBs, several points can be made. Proper measurement techniques of other postretirement benefits are less well defined and subject to more measurement uncertainty than pension obligations. The respective size of the net postretirement benefits obligation is substantially larger for most firms than the size of the net pension obligation, due to the existence of pension assets whose fair market value often equals or exceeds the pension obligation. Because of these factors alone it may be reasonable to anticipate broad disparity with regard to the risk associated with OPEB obligations. For this reason alone the risk premia expectations of bond rating analysts may not fully match those of the actual primary issue marketplace.

This research indicates that primary issue bond market participants assess a higher risk premia to postretirement benefits than analysts assigning the initial rating to the bond issue may expect. Further, this additional investor risk is clearly associated with the OPEB information that is available in the footnotes of the financial statements under SFAS 81. With these findings, this study adds to the existing body of literature in accounting and finance by providing empirical evidence regarding the impounding of various employee benefit liabilities in bond pricing. The importance of various accounting measures for pensions and other postretirement benefits has not yet been fully established in the bond pricing literature. This study provides important evidence regarding the bond market’s recognition of these large future obligations. While there is continuing discussion of the appropriate method of measuring the open-ended liabilities, there is little doubt that financial markets acknowledge their importance and incorporate them in the pricing of new bond issues.

Suggestions For Future Research

The research described here investigates the relationships between postretirement benefit obligations and primary market bond yields for a particular period of time. It would be useful to know if these same relationships hold true for other windows in time. As more data becomes available it will be possible to conduct research utilizing information required by SFAS 106 pertaining to corporation’s other postretirement benefit obligations. This information is now required to be more detailed and extensive. Such research will allow this body of knowledge to continue to grow.

Endnotes


2. Moody’s ratings incorporate a judgement of event-risk covenants directly into their traditional bond ratings, adjusting these ratings in accordance with the protection provided.

3. As an example, Lamy and Thompson (1988) and Allen, Lamy, and Thompson (1987) reported the estimated coefficients of this variable to be positive and significant. Allen, Lamy, and Thompson(1990), on the other hand, reported the coefficient of this variable to be insignificantly different from zero for their entire sample. The level of interest rate volatility in a specific estimation period may well give some insight into this mixed pattern of results.

4. Various specifications have been used to measure the influence of this variable, the most common is a simple dichotomous variable, where the variable is set to one if the issue is callable (or refundable) and zero otherwise (for example, see Kidwell, Marr and Thompson (1984)) For a more detailed investigation of call and refunding protection see Thatcher (1985) and Allen, Lamy, and Thompson (1987).

5. Various specifications of this variable include a simple zero-one variable (Kidwell, Marr, and Thompson (1984) and the number of the years until the sinking fund begins (Allen, Lamy, and Thompson (1987)).

6. SFAS 81 was issued in November 1984. The sample period for this study began January 1, 1986 to allow corporations time
for proper data collection and presentation in the footnotes. Because SFAS 106 was released in 1990, a release that signaled a change in policy for the release of OPEB information, the data set ends with 1990.

7. Data was gathered for each firm regarding the cost of providing postretirement benefits for that particular fiscal year as well as the interest rate used to discount the corporate pension obligation back to the present. This data was retrieved from available corporate annual reports and the Westlaw online database.

8. Previous papers using the relative yield spread specification have displayed adjusted R's in the range presented in Table 2. For example see Allen, Lamy, and Thompson (1987, 1990).

9. The analysis was also performed using the Projected Benefit Obligation (PBO) measure of the pension obligation. The findings were unchanged.

10. That this variable is a proxy for some other risk characteristic is obviously a possibility. However, the likelihood that this variable would serve as a proxy across this large number of firms, generating such a strong statistical relationship (probability values in the .005 range), while the pension variables are consistently insignificant, seems remote.

References


