Do Firms Set Pension Discount Rates Strategically?

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Abstract
Corporations reduce the magnitude of pension contributions through the choices of pension liability discount rates, and do so asymmetrically: firms are slow to drop the rates when corporate bond rates drop, but raise them rapidly when rates rise. Cross-sectionally, firms with greater investment productivity and facing more financial difficulty set higher pension discount rates. Consistently, we find that firms setting high pension discount rates tend to have higher funding ratios and that setting high pension discount rates allow more productive firms to invest more and become more profitable when they face a lower level of insolvency risk. Imperfect elasticity of pension discount rates to market interest rates offers firms leeway to alleviate the constraints from defined benefit pension plans.

Motivation
- Firms are more likely to inflation pension discount rate during large interest rate drop period
- Firms with better investment opportunity are more likely to set higher pension discount rates
- The positive relationship intensified for for low financial risk firms
- A higher pension discount rate increases firms pension funding
- A higher pension discount rate increases firms investment and improves operating performance

Conceptual Framework
Objective function:
\[ v_t = p_t + \left( f(c_t) - i_t \right) + \left( h(c_t) - c_t \right) + \frac{\partial v_{t+1}}{\partial c_t} \]
\[
\text{profit in year } t \quad \text{PPA}(c_{t+1})
\]
Setting \( v_t = f(c_t) - i_t + h(c_t) - c_t + \frac{\partial v_{t+1}}{\partial c_t} \), we have
\[
\frac{\partial v_t}{\partial c_t} = \frac{\partial v_{t+1}}{\partial c_t} \quad \text{with pension funding constraint and time consistent relation}
\]
\[
\frac{\partial v_t}{\partial c_t} = \frac{\partial v_{t+1}}{\partial c_t} = \frac{\partial v_{t+2}}{\partial c_t} = \ldots \]
Then,
\[
\frac{\partial v_t}{\partial c_t} = \frac{\partial v_{t+1}}{\partial c_t} = \frac{\partial v_{t+2}}{\partial c_t} = \ldots
\]
Three scenarios: 1) \( \frac{\partial v_t}{\partial c_t} < 0 \); 2) \( \frac{\partial v_t}{\partial c_t} < 0 \); 3) \( \frac{\partial v_t}{\partial c_t} > 0 \).

Tradeoffs and Hypotheses
- H1 (Pension Discount Rates over Time): Corporates are more likely to set higher pension discount rates when interest rates significantly drop.
- H2 (Investment Productivity and Pension Discount Rates): Highly productive firms are more likely to set higher pension discount rates. The effect is stronger among low financial risk firms.
- H4 (Pension Discount Rates and Funding and investment): All others being equal, pension funding is higher for firms setting higher pension discount rates.
- H5 (Pension Discount Rates and profitability): Firm investments and profitability are higher for firms setting higher pension discount rates. This effect is stronger among firms with lower financial risk.

Data
- Compustat and CRSP
- Bond prices & yields from Enhanced TRACE
- Other bond information from Mergent FISD

Empirical Finding
- Prior pension discount rates have a strong effect on the pension discount rate data.
- Benchmark rates and asymmetric effect on firms choice of pension discount rates (Hypo. 1)
- Prior pension discount rates have an asymmetric effect on firms choice of pension discount rates (Hypo. 2)
- Firms with better investment opportunity are more likely to set higher pension discount rates (Hypo. 3)
- The positive relationship intensified for low financial risk firms (Hypo. 4)
- A higher pension discount rate improves firms’ pension funding (Hypo. 5)

Conclusion Remarks
- Can firms discretionarily set pension discount rates (within some bounds) -- YES
- Do firms strategically manage their pension discount rates -- YES
- Are discount rate management effective to firm performance -- YES