

Surplus Utility

Surplus utility:

$$\begin{aligned} \text{Max}(U_S) &= R_S - \lambda \sigma_S^2 \\ &= \left(\frac{A_0}{L_0} - 1 \right) R_F + \beta_S \mu_Q - \lambda_B \beta_S^2 \sigma_Q^2 \\ &\quad + \left(\frac{A_0}{L_0} \alpha_A - \alpha_L \right) - \lambda \omega \left[\left(\frac{A_0}{L_0} \right)^2 \omega_A^2 - 2 \frac{A_0}{L_0} \omega_{A,L} + \omega_L^2 \right] \end{aligned}$$

- initial funding ratio critical -> plan can't 'earn it's way out' of being under funded
- by controlling pension surplus, can better control contributions and expenses

Source: V-C127-09 *Liability-Relative Strategic*, pp 50, 53, 55, 57

Relative Value Measures for MBS

1. Spread to benchmark treasury bond
2. Spread to WAL treasury
3. “Zero spread”
4. Option-adjusted spread (OAS) is the most important measure
5. Effective duration and convexity

Source: HFIS, Chapter 23

Systematic Risks

Substitutes diversifiable risks for highly systematic risks

- More sensitive to severe economic downturn
- Risk premia is higher than previously thought
- Yields were too low

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Equitizing a Market-Neutral Long-Short Portfolio

- Equitize by holding stock index futures. Rate of return is the sum of gains/losses on long/short securities, the gain or loss on the long futures position, and any interest earned on the cash position that results from the short positions, all divided by the portfolio equity.
- A long-short spread can be transported to various asset classes (e.g., using futures contracts).
- Investments without systematic risk earn risk free rate, hence, a market-neutral portfolio's return should be measured against a risk-free return (e.g., Treasury bill)
- If the long-short portfolio has been equitized, then it should be treated as equity, with the returns benchmarked to the underlying equity index.

Source: *Managing Investment Portfolios* Ch 7

Quantitative Methods for Portfolio Optimization

1. Optimization methods
 - a. Optimal risk budgeting based upon skill
 - b. IR is proportional to the correlation between predictions and realizations (skill) and the breadth (dimensionality)

2. Asset allocation for buy-and-hold investors
 - a. Default risk
 - b. Default correlation
 - c. Issuer diversification for limiting default losses
 - d. Allocation among credit qualities

Source: HFIS, Chapter 44