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Non-Myopic Portfolio Choice with Minimum Guarantees

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In this study, we revisit the portfolio selection problem for long-term investors (i.e., life insurers, pension fund managers and wealthy individuals) incorporating minimum guarantee requirement. Through reviewing the framework in Deelstra et al. (2003), we show that the optimal investment decision can be decomposed into an optimal constant relative risk aversion *CRRA*(γ,T) mutual fund and the dynamic hedging demand induced by the guarantee requirement. The dynamic hedging demand can be replicated by the traded assets in the market including cash, stock index and rolling bond.

Based on the explicit solutions in the three-asset framework, the results are as follows.

(1) When the coefficient of relative risk aversion γ of the investor decreases, which means the investor is more risk averse, the proportions of wealth invested in stock and bond decrease. The optimal weight in bond decreases within the *CRRA(γ,T)* mutual fund, but increases in the hedging demands. The investment behavior of the investors is significantly influenced by the time to maturity. Based on the results, the investors are becoming more cautious in rebalancing their portfolio as time approach maturity.

(2) The hedge ratio defined as the ratio of the present value of the minimum guarantee and the market value of the accumulated wealth is employed in balancing the speculating and hedging objective. Hedge ratio closes to 1, the investor is recommended to reduce the stock holding through generating a short position in his hedging component. While, hedge ratio closes to 0, the investors should hold the position of the stock index to profit from the capital gain.

Illustrated examples are provided to evaluate the fund performance. Hence our study has provided valuable recommendations for the investors in making their financial decisions.

Key Words: Minimum Guarantee, CRRA, Mutual Fund, Hedging Demand, Risk Aversion.

保證收益基金之最適跨期資產選擇

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本研究重新檢視最低保證收益下，長期投資人(諸如保險公司、退休基金機構法人與高淨值自然人)跨期資產配置之財富管理議題，回顧先前 Deelstra et al.(2003)之模型架構，本研究結果顯示基金投資策略可表示爲最適 *CRRA*(γ,T)型態共同基金與最低收益避險之組合。

本文以現金、固定存續債券與股票指數所構成之市場結構進行分析，歸納結果如下：

(1) 當投資人風險趨避程度增加，投資於股票及債券比例減少。於 *CRRA*(γ,T)型態共同基金中，當風險趨避程度增加時，債券比例減少；而在避險需求面，當風險趨避程度增加時，債券比例增加。距到期日時間將顯著影響投資人交易策略，時間愈接近到期日，投資人將減緩調整資產部位。

(2) 保證避險比例定義爲到期保證現值與資產市值之比，評估投資人資本利得與保證避險於最適投資組合之考量。當保證避險比例趨近 *1* 時，投資人將因爲保證避險部位的放空需求，減少股票持有部位；當保證避險比例趨近 *0* 時，投資人將維持現有的股票持有部位，進行資本利得操作。

本文同時分析不同情境下，最適投資策略與基金績效，研究結果可提供長期投資人給定最低收益保證下之決策依據。

關鍵詞：收益保證、CRRA、共同基金、避險需求、風險規避。

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