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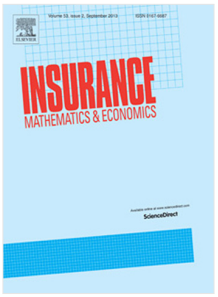

Optimal investment under VaR-regulation and minimum insurance

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Optimal investment under VaR-Regulation and Minimum Insurance

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Abstract

We look at an optimal investment problem of a financial institution operating under a joint Value-at-Risk and a portfolio insurance constraint. This analysis is particularly relevant for an insurance company operating under the Solvency II regulation which aims to maximize the expected utility of its shareholders, while at the same time being required to provide its policyholders a minimum guaranteed amount. Using static Lagrangian method, we solve the pointwise utility optimization problem to achieve the global maximum by carefully comparing the local maximizers with the jump point or the boundary. Our theoretical and numerical results show that contrary to a pure Value-at-Risk regulation, an insurance company that operates not only under a Solvency II VaR constraint but additionally has to serve a minimal guarantee admits a comprehensive but not too costly protection, and at the same time displays prudent investment behavior. This result holds for both constant and stochastic volatility settings.

JEL classification: C61, G11, G18, G31

Key words: Value at Risk, optimal portfolio, portfolio insurance, risk management, Solvency II regulation

1 Introduction

The present paper contributes to the literature on utility maximization problems by incorporating a Value-at-Risk (VaR) and a portfolio insurance (PI) constraint. To the best of our knowledge, our project is the first paper addressing both constraints in

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