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**Cash flow matching with risks controlled by buffered probability of exceedance and conditional value-at-risk.** (English) [Zbl 1404.91269](#)

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Summary: Bond immunization is an important topic in portfolio management. This paper presents a scenario based optimization framework for solving a cash flow matching problem. In this problem, the time horizon of the cash flow generated by the liability is longer than the maturities of the available bonds, and the interest rates are uncertain. Bond purchase decisions are made each period to generate cash flows to cover the obligations due in the future. We use buffered probability of exceedance (bPOE) and conditional value-at-risk (CVaR) to control for the risk of shortfalls. The initial cost of the hedging portfolio of bonds is minimized and optimal positions in bonds are calculated at all time periods. We also study the methodology when solving the optimization problem to minimize bPOE instead of CVaR, which has important practical relevance. The methodology we present in this paper is quite general and can be extended to other financial optimization problems. We use portfolio safeguard optimization package to solve the optimization problems.

**MSC:**

[91G70](#) Statistical methods; risk measures  
[91G20](#) Derivative securities (option pricing, hedging, etc.)  
[91G10](#) Portfolio theory

Cited in **3** Documents

**Keywords:**

risk management; bond immunization; buffered probability of exceedance (bPOE); conditional value-at-risk (CVaR)

**Software:**

Portfolio Safeguard; PSG

**Full Text:** [DOI](#)

**References:**

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