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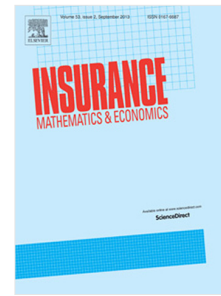
Samuel H. Cox, Yijia Lin, Tianxiang Shi

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PENSION RISK MANAGEMENT WITH FUNDING AND BUYOUT OPTIONS

SAMUEL H. COX, YIJIA LIN AND TIANXIANG SHI

ABSTRACT

There has been a surge of interest in recent years from defined benefit pension plan sponsors in de-risking their plans with strategies such as “longevity hedges” and “pension buyouts” (Lin et al., 2015). While buyouts are attractive in terms of value creation, they are capital intensive and expensive, particularly for firms with underfunded plans. The existing literature mainly focuses on the costs and benefits of pension buyouts. Little attention has been paid to how to capture the benefits of de-risking within a plan’s financial means, especially when buyout deficits are significant. To fill this gap, we propose two options, namely a *pension funding option* and *pension buyout option*, that provide financing for both underfunded and well funded plans to cover the buyout risk premium and the pension funding deficit, if a certain threshold is reached. To increase market liquidity, we create a transparent pension funding index, calculated from observed capital market indices and publicly available mortality tables as well as pension mandatory contributions, to determine option payoffs. A simulation based pricing framework is then introduced to determine the prices of the proposed pension options. Our numerical examples show that these options are effective and economically affordable. Moreover, our sensitivity analyses demonstrate the reliability of our pricing models.

Keywords: defined benefit pension plan, risk management, pricing, funding options, buyout options.

Samuel H. Cox is in the Department of Risk Management & Insurance, J. Mack Robinson College of Business, Georgia State University, email: samcox@gsu.edu. Yijia Lin is in the Department of Finance, College of Business, University of Nebraska - Lincoln, email: yijialin@unl.edu. Tianxiang Shi is in the Department of Risk, Insurance, & Healthcare Management, Fox School of Business, Temple University, email: Tianxiang.shi@temple.edu. We are grateful to David Blake and one anonymous referee for very helpful comments.

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