

THE IMPACT OF NATURAL HEDGING ON A LIFE INSURER'S RISK SITUATION

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This version: August 2011

ABSTRACT

Systematic mortality risk, i.e. the risk of unexpected changes in mortality and survival rates, can substantially impact a life insurers' risk and solvency situation. By using the "natural hedge" between life insurance and annuities, insurance companies have an effective tool for reducing their net-exposure. The aim of this paper is to analyze this risk management tool and to quantify its effectiveness in hedging against changes in mortality with respect to default risk measures. To achieve this goal, we model the insurance company as a whole and take into account the interaction between assets and liabilities. Systematic mortality risk is considered in two ways. First, a shock to the index reflecting the general level of mortality based on the Lee-Carter (1992) model is assumed and, second, empirically observed changes in mortality rates for the last 10-15 years are used. We demonstrate that the consideration of both the asset and liability side is vital to obtain deeper insight into the impact of natural hedging on an insurer's risk situation and show how to reach a desired safety level while simultaneously immunizing the portfolio against changes in mortality rates.

Keywords: Longevity risk, mortality risk, natural hedging, life insurance, risk management

JEL Classification: G22, G23, G32, J11