Securitization of Crossover Risk in Reverse Mortgages

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ABSTRACT

When the outstanding balance exceeds the housing value before the loan is settled, the insurer suffers an exposure to crossover risk induced by three risk factors: interest rates, house prices and mortality rates. Under the consideration of housing price risk, interest rate risk and longevity risk, we provide a three-dimensional lattice method which simultaneously captures the evolution of housing price and short-term interest rate to numerically calculate the fair valuation of reverse mortgages. For a mortgage reverse insurer, the premium structure of reverse mortgage insurance is determined by setting the present value of total expected claim losses equal to the present value of the premium charges. However, when the actual loss is higher than the expected loss, the insurer will incur an unexpected loss. To offset the potential loss, we also design a crossover bond, the payoff structure of which is related to the actual losses and expected losses, to transfer the unexpected loss into the bond investors. Therefore, through the crossover bonds, the reverse mortgage insurers can transfer the crossover risk into the bondholders.

Keyword: reverse mortgages, crossover risk, longevity risk, crossover bonds.

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