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Scandinavian Actuarial Journal ›
Volume 2010, 2010 - Issue 1

APPLIED SECTION

Lapse rate modeling: a rational expectation approach

Domenico De Giovanni ✉

66 Cite this article ↗ https://doi.org/10.1080/03461230802550649

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Abstract

The surrender option embedded in many life insurance products is a clause that allows policyholders to terminate the contract early. Pricing techniques based on the American Contingent Claim (ACC) theory are often used, though the actual policyholders' behavior is far from optimal. Inspired by many prepayment models for mortgage backed securities, this paper builds a Rational Expectation (RE) model describing the policyholders' behavior in lapsing the contract. A market model with stochastic interest rates is considered, ... imation of the corre... tion. Extensiv... nd interest rate ... y of the contra...

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Notes

1. We need to further assume some smoothness and integrability conditions.

2. Specifying the condition at r=0 is a delicate issue. Zvan et al. ([1998](#)) let the partial differential equation be satisfied at that boundary. Barone-Adesi et al. ([2003](#)) use a Neumann boundary condition. Having experimented both alternatives, we align with Zvan et al. ([1998](#))'s choice which seems to be more robust.

3. A better solution would be to let θ^I depend on some economic indicators giving information about the financial difficulties of the policyholders such as the unemployment rate, rather than keeping it constant (see Kuo et al. [2003](#), Kim [2005](#)). However, the introduction of such variables considerably affects the simplicity of the model, since a new source of risk that cannot be hedged away should be taken into account.

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