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APPLIED SECTION

Lapse rate modeling: a rational expectation approach

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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 behavior model (CBB) are used to estimate the surrender rates. The CBB model is based on the assumption that policyholders' behavior is influenced by the economic environment. The CBB model is a rational expectation approach.

backed by empirical data. The CBB model is a rational expectation approach. The CBB model is a rational expectation approach. The CBB model is a rational expectation approach.

rates is a function of the economic environment. The CBB model is a rational expectation approach. The CBB model is a rational expectation approach. The CBB model is a rational expectation approach.

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Externalities are a function of the economic environment. The CBB model is a rational expectation approach. The CBB model is a rational expectation approach. The CBB model is a rational expectation approach.

rate elasticity is a function of the economic environment. The CBB model is a rational expectation approach. The CBB model is a rational expectation approach. The CBB model is a rational expectation approach.

contract is a function of the economic environment. The CBB model is a rational expectation approach. The CBB model is a rational expectation approach. The CBB model is a rational expectation approach.

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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^l 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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