

Scandinavian Actuarial Journal >

Volume 2017, 2017 - [Issue 3](#)

183 Views | 4 CrossRef citations to date | 0 Altmetric

Articles

A lattice-based model to evaluate variable annuities with guaranteed minimum withdrawal benefits under a regime-switching model

M. Costabile 

Pages 231-244 | Accepted 01 Nov 2015, Published online: 14 Dec 2015

 Cite this article  <https://doi.org/10.1080/03461238.2015.1119716>



Sample our
Economics, Finance,
Business & Industry Journals
>> **Sign in here** to start your access
to the latest two volumes for 14 days

 Full Article  Figures & data  References  Citations  Metrics

 Reprints & Permissions

Read this article

Share

Abstract

We consider the problem of evaluating variable annuities with a guaranteed minimum withdrawal benefit under a regime-switching model. We propose a trinomial lattice model to approximate the evolution of the investment fund value and the policy value at inception is computed through a backward induction scheme. Finally, the insurance fee is computed as the solution of the equation that makes the contract actuarially fair. Numerical results are reported to illustrate the consistency of the proposed model.

Keywords:

minimum guaranteed withdrawal benefit

variable annuities

regime-switching models

Acknowledgements

The author wishes to thank two anonymous referees for helpful comments and suggestions. All remaining errors are the sole responsibility of the author.

Notes

No potential conflict of interest was reported by the author.

1 In the case of β , we set $\beta = 0$, hence $\beta = 0$. In other words, once the reference fund reaches zero it stays trapped there until maturity.

2 The existence of the solution is shown in the Appendix [4](#).

Related research

People also read

Recommended articles

Cited by
4

[Valuation and optimal surrender of variable annuities with guaranteed minimum benefits and periodic fees >](#)

J. Lars Kirkby et al.
Scandinavian Actuarial Journal
Published online: 7 Nov 2022

Information for

[Authors](#)

[R&D professionals](#)

[Editors](#)

[Librarians](#)

[Societies](#)

Opportunities

[Reprints and e-prints](#)

[Advertising solutions](#)

[Accelerated publication](#)

[Corporate access solutions](#)

Open access

[Overview](#)

[Open journals](#)

[Open Select](#)

[Dove Medical Press](#)

[F1000Research](#)

Help and information

[Help and contact](#)

[Newsroom](#)

[All journals](#)

[Books](#)

Keep up to date

Register to receive personalised research and resources by email



Sign me up



Copyright © 2026 Informa UK Limited [Privacy policy](#)

[Cookies](#) [Terms & conditions](#) [Accessibility](#)

Registered in England & Wales No. 01072954
5 Howick Place | London | SW1P 1WG



Taylor & Francis
by informa