

Applied Mathematical Finance >
Volume 16, 2009 - Issue 6

411 Views | 38 CrossRef citations to date | 0 Altmetric

Original Articles

Valuing the Guaranteed Minimum Death Benefit Clause with Partial Withdrawals

A. C. Bélanger, P. A. Forsyth & G. Labahn

Pages 451-496 | Received 16 Jun 2008, Published online: 06 Nov 2009

Cite this article <https://doi.org/10.1080/13504860903075464>

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](#)

Abstract

In this paper, we give a method for computing the fair insurance fee associated with the guaranteed minimum death benefit (GMDB) clause included in many variable annuity contracts. We allow for partial withdrawals, a common feature in most GMDB contracts, and determine how this affects the GMDB fair insurance charge. Our method models the GMDB pricing problem as an impulse control problem. The resulting quasi-variational inequality is solved numerically using a fully implicit penalty method. The

About Cookies On This Site

We and our partners use cookies to enhance your website experience, learn how our site is used, offer personalised features, measure the effectiveness of our services, and tailor content and ads to your interests while you navigate on the web or interact with us across devices. You can choose to accept all of these cookies or only essential cookies. To learn more or manage your preferences, click "Settings". For further information about the data we collect from you, please see our [Privacy Policy](#).

Accept All

Essential Only

Settings

Acknowledgement

This work was supported by the Natural Sciences and Engineering Research Council of Canada.

Notes

- ¹ Intuitively, this can be viewed as a discretely observed lookback option based on the maximum value of the underlying (Wilmott, [1998](#)).
- ² We remark that our PDE approach can easily be extended to model different withdrawal policies. For example, an alternate withdrawal policy, whereby the deposit is reduced by the amount withdrawn but the death benefit is reduced on a proportional basis, could be easily implemented.
- ³ Note that this is trivially true at .

Related research ⓘ

People also read

Recommended articles

Cited by
38



About Cookies On This Site

We and our partners use cookies to enhance your website experience, learn how our site is used, offer personalised features, measure the effectiveness of our services, and tailor content and ads to your interests while you navigate on the web or interact with us across devices. You can choose to accept all of these cookies or only essential cookies. To learn more or manage your preferences, click “Settings”. For further information about the data we collect from you, please see our [Privacy Policy](#).

Accept All

Essential Only

Settings

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



About Cookies On This Site

We and our partners use cookies to enhance your website experience, learn how our site is used, offer personalised features, measure the effectiveness of our services, and tailor content and ads to your interests while you navigate on the web or interact with us across devices. You can choose to accept all of these cookies or only essential cookies. To learn more or manage your preferences, click “Settings”. For further information about the data we collect from you, please see our [Privacy Policy](#).

 Accept All

Essential Only

Settings