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# Valuing the Guaranteed Minimum Death Benefit Clause with Partial Withdrawals

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A screenshot of a privacy consent dialog box. The dialog has a white background and a dark blue header bar with the text "We Care About Your Privacy". Below the header, there is a paragraph of text explaining that the company and its 842 partners store and/or access information on a device, such as unique IDs in cookies, to process personal data. It states that users can accept or manage their choices by clicking below, including their right to object where legitimate interest is used, or at any time in the privacy policy page. It also mentions that these choices will be signaled to their partners and will not affect browsing data. A link labeled "Privacy Policy" is provided. To the left of the text is a circular icon with a dark blue background and a white cookie with green dots. To the right of the text are three buttons: "I Accept" (dark blue with a white 'X' icon), "Essential Only" (dark blue), and "Show Purpose" (white with a dark blue border). The background of the screenshot is a blurred image of a document with text.

Use precise geolocation data. Actively scan device characteristics for identification. Store and/or access information on a device. Personalised advertising and content, advertising and content measurement, audience research and services development.

### Show Purpose



impulse control    fully implicit penalty method

## Acknowledgement

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

## Notes

<sup>1</sup> Intuitively, this can be viewed as a discretely observed lookback option based on the maximum value of the underlying (Wilmott, [1998](#)).

<sup>2</sup> 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 For example, an alternate withdrawal policy, whereby the deposit is reduced by the amount withdrawn but the death benefit is reduced on a proportional basis, could be easily implemented.

<sup>3</sup> Note that this is trivially true at .

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