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SYNOPSIS

A FRAMEWORK FOR THE VALUATION OF NON-MARKET BASED EMBEDDED OPTIONS IN LIFE INSURANCE PRODUCTS

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Key words: Embedded options; Pricing; Valuation; Risk management

Purpose of your paper: The purpose of this paper is to challenge the existing approach in valuing behavioural options in life insurance products.

Reasonable frameworks exist for valuing market-based embedded options. For example, approximations of the value of Guaranteed Minimum Accumulation Benefits can be found using the Black-Scholes formula. More complicated products (such as Guaranteed Minimum Withdrawal Benefits) can be valued using stochastic simulation.

Behavioural (or non-market based) options are options whose value depend on individual policyholder circumstances and behaviours. Actuaries have generally overlooked these in the pricing of life insurance products. We propose a framework in which to both value and understand the underlying risks behind these types of options.

Synopsis: Insurance regulations require life insurers to value all embedded options. Reasonable frameworks exist for valuing market-based embedded options, be it formula-based or stochastic pricing. Behavioural options, however, are much more difficult to value; life insurers have so far made little progress in valuing these types of options.

The purpose of this paper is to challenge the existing approach in valuing behavioural options. We will argue that some of the current problems in the life insurance industry stem from a lack of understanding of not only the value of embedded behavioural option, but also the underlying drivers of the risk behind these options.

The paper

- Outlines the various behavioural options embedded in products offered in Australia.
- Gives an overview of the framework currently used to value these options by the life industry.
- Develops a framework for identifying the risk drivers that might lead a policyholder to value an embedded option more highly and the implications of these on life insurers' risk profile.
- Proposes a method for the quantitative valuation of embedded options.