



Prophet Variable Annuity Modules

There are separate modules for the Unit Linked and International libraries to model variable annuities which are now becoming popular outside of North America. Variable annuities are a liability type already included in the standard US library. The modules have been designed to cover the complex product features and guarantees of variable annuities.

The iWorks Prophet Variable Annuity Modules allow for the different types of guaranteed benefits typically found around the world in variable annuity products. Embedded values and Market Consistent Embedded Values can be calculated with this module for variable annuity products.

The module is typically run stochastically, for pricing and reserving this library includes nested stochastic functionality. The module can easily be customised through Prophet's open and flexible development environment to cater for company specific features.

When used with other libraries in particular the Asset Liability Strategy Library, the variable annuity products can be used as part of the wider risk management of the company.

Features

Types of Guaranteed Benefits Available

- Guaranteed Minimum Death Benefit (GMDB) - 6 options including return of premiums, rollup and ratchet.
- Guaranteed Minimum Withdrawal Benefit (GMWB) – choice of reducing fund or lifetime option, with optional bonus credits and ratchet.
- Guaranteed Minimum Accumulation Benefit (GMAB) – guaranteed percentage of premiums paid less withdrawals at flexible dates, with balance either paid to policyholder or added to fund.
- Guaranteed Minimum Income Benefit (GMIB) – based on a guaranteed growth in the underlying fund and guaranteed annuity rates at retirement.

Other Features

- Multi-fund functionality – each model point can invest in as many different funds as required, each with their own assumptions regarding growth, charges and deductions and with transfers between funds.
- Annuity conversion – option for the fund to convert to an annuity or for the benefit to be taken in the form of a lump sum.
- Reserving – unit reserves, sterling reserves (Unit Linked library only), value of the annuity element and reserve for the guarantees (percentage of fund, discounted costs less charges or Conditional Tail Expectation).
- Pricing – value at point of sale of the guarantee costs and charges, either using a fixed discount rate or a market-consistent approach.
- 'Greeks' – Both Delta and Gamma Greeks are calculated for the variable annuity liabilities, allowing this information to be used as part of a hedging strategy.
- Nested Stochastic – Inner stochastic loops can be run on variable annuity business to accurately value the guarantees.

Benefits

This module allows companies who sell variable annuities to price, reserve and calculate embedded value on contracts as well as project cash flows. Modules are available for the International and Unit Linked libraries. Many common guarantees are modelled in the standard module and further customisations can be easily made. The module is rich in features and allows for both nested stochastic modelling and calculation of Delta and Gamma Greeks.

Summary

This is an optional add on module which allows companies outside of the US wishing to sell Variable Annuities to price and value these complex products. With the calculation of the Delta and Gamma Greeks or when used in conjunction with the Replicating Portfolio module can be used as part of a company's hedging strategy.

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