



# Milliman

Consultants and Actuaries

The management of equity and interest rate risk is a particularly important area in which Milliman specialises. At the heart of our services in this field is our groundbreaking technologically driven tool, known as MG-Hedge, which has the capacity for nightly seriatim valuations of large insurance portfolios and round the clock market trading to optimise risk management.

The system has already met with considerable success in the U.S. and Japan where the vast majority of insurers with equity-based products have adopted them, effectively creating the industry standard in those markets. It is now being introduced into the UK and other European and Asian countries.

## High Level Specifications of MG – Hedge

The system has 3 main components:

- A valuation system
- A trade positioning system
- A financial reporting system

### The Valuation System

The valuation system brings together actuarial and IT expertise in the following ways:

- IT expertise is utilised to link into the policy liability database to enable frequent, e.g. nightly valuations on a per policy seriatim basis.
- Actuarial expertise is utilised to model the liability cash flows to compute the value of the liabilities such as guarantees and embedded options.
- Distributed computing technology is utilised for stochastic valuations of large portfolios on an overnight basis

Our valuation models are flexible and customisable, thereby capable of allowing for path dependencies such as due to dynamic policyholder behaviours, management actions, or tax.

### The Trade Positioning System

The trade positioning system brings together IT and capital markets expertise in the following ways:

- IT expertise is utilised to link into both the asset portfolio database, market pricing databases (currently Bloomberg's) to enable around the clock valuations (actually every 15 seconds) of the asset and hedge positions.
- Capital markets expertise is employed to compute the dynamic risk positions (the so-called 'Greeks': Delta, Gamma, Rho, Vega – depending on the level and sophistication of hedge chosen.
- The trade positioning system compares the risk positions of the assets with those of the liabilities, and has the capability of making trading recommendations, depending on the hedging strategy and parameters being adopted.

### The Financial Reporting System

The financial reporting system forms a key part of the overall risk management framework.

- Regular comparisons of the values of the assets (including hedge positions) and liabilities enable the profitability of the business to be monitored on a regular basis – e.g. weekly.
- Furthermore, by analysing the relevant market movements over the period, the various sources of the profit can be quantified and explained. The regular production of such reports helps demonstrate that the risks are under control.



- Reports on the effectiveness of the hedging programme are also available through an analysis of the emerging profitability with and without the hedge. Milliman's high-spec technology also facilitates stochastic on stochastic projections to test the impact of alternative hedging strategies under a wide range of scenarios.

The financial reporting module is also highly customisable:

- We have the capability to provide advice under various so-called risk adjusted performance measures (RAPM), including for example returns on either European or market consistent embedded values.
- Our purpose built realistic and arbitrage free stochastic asset models enable us to investigate the effectiveness of different hedging strategies under a wide range of different accounting bases.
- Specialist risk reports such as VaR and CTE analyses are also available.