

## 5. Embedded Value assumptions

Projections of future shareholder cash flows expected to emerge from covered business are determined using best estimate operating assumptions. These assumptions, including mortality, morbidity, persistency and expenses, reflect recent experience and are actively reviewed. Allowance is made for future improvements in annuitant mortality based on experience and externally published data. Favorable changes in operating experience are not anticipated until the improvement has been observed – in particular for expenses.

Future economic assumptions, for example, investment returns and inflation, are based on period end conditions and assumed risk discount rates are consistent with these.

### a) Economic assumptions

#### Market consistent framework

Zurich has adopted a computational method known as “risk neutral”. With this method the key economic assumptions are:

- the risk free rates;
- the implied volatilities of different assets; and,
- the way that different asset returns are correlated with each other.

Expected asset returns in excess of the risk free rate have no bearing on the calculated EV.

#### Choice of “risk free yield curve”

The risk free yield curve is derived from mid-market swap rates applicable to each economy as of December 31, 2006. This curve was used to extract forward reinvestment yields that are used for all asset classes.

These yield curves are consistent with the assumptions used by investment banks to derive their option prices, and hence their use ensures consistency with the derivation of implied volatilities. They also have the advantage that they are available for most of the markets in which Zurich operates.

The following table shows the risk free yield curves, expressed as annualized spot rates, used at various terms for the main economies covered by the EV. These have been derived from interest rate swaps, and extrapolated where necessary.

Table 5.1 as of December 31, 2006		1 Year	2 Year	5 Year	10 Year	20 Year	40 Year
<b>Risk free yield curves – Annualised spot rates</b>	<b>Economy</b>						
	United States	5.3%	5.2%	5.1%	5.2%	5.3%	5.4%
	United Kingdom	5.6%	5.5%	5.4%	5.1%	4.6%	4.2%
	Euro Zone	4.0%	4.1%	4.1%	4.2%	4.3%	4.3%
	Switzerland	2.4%	2.6%	2.7%	2.8%	2.9%	2.9%

Domestic yield curves are also used for businesses in other countries, except Hong Kong and Argentina which use US dollar, as their liabilities are principally US dollar denominated.

#### Implied asset volatility

The volatility statistics shown below are based on analysis of the ESG output data, and hence show the economic projection assumptions produced by the ESG for the four main currencies.

Interest volatility can be described by the implied volatility of interest rate swaptions. Swaption implied volatilities vary both by the term of the option and also the term of the underlying swap contract. The following tables show swaption implied volatilities, based on the simulations used for the EV calculation:

Table 5.2							
as of December 31, 2006		1 year option	2 year option	5 year option	10 year option	20 year option	40 year option
<b>Implied volatility of at-the-money-forward interest rate swaptions</b>	<b>US dollar</b>						
	1 year swap	18.7%	18.6%	18.0%	16.8%	14.0%	12.7%
	2 year swap	18.5%	18.3%	17.7%	16.5%	13.7%	12.5%
	5 year swap	17.7%	17.4%	16.9%	15.7%	13.1%	12.1%
	10 year swap	16.5%	16.1%	15.6%	14.6%	12.2%	11.5%
	20 year swap	14.6%	14.2%	13.7%	12.8%	10.7%	10.7%
	<b>British pound sterling</b>						
	1 year swap	14.0%	13.0%	13.0%	13.0%	13.0%	12.8%
	2 year swap	13.7%	12.8%	12.9%	13.0%	13.0%	12.8%
	5 year swap	13.1%	12.5%	12.7%	12.8%	13.0%	12.8%
	10 year swap	12.8%	12.4%	12.7%	12.7%	13.0%	12.7%
	20 year swap	12.8%	12.6%	13.0%	12.8%	12.9%	12.2%
	<b>Euro</b>						
	1 year swap	17.2%	16.6%	16.0%	15.7%	13.9%	11.8%
	2 year swap	17.0%	16.4%	15.8%	15.5%	13.8%	11.7%
	5 year swap	16.4%	15.9%	15.3%	15.0%	13.4%	11.2%
	10 year swap	15.5%	15.0%	14.5%	14.2%	12.7%	10.6%
	20 year swap	14.2%	13.7%	13.3%	13.2%	11.6%	9.6%
	<b>Swiss Franc</b>						
	1 year swap	21.7%	21.6%	21.0%	19.8%	17.6%	15.0%
	2 year swap	21.5%	21.4%	20.8%	19.6%	17.4%	14.8%
	5 year swap	20.7%	20.6%	20.0%	18.8%	16.8%	14.2%
	10 year swap	19.4%	19.3%	18.8%	17.8%	15.8%	13.4%
	20 year swap	17.5%	17.4%	17.0%	16.1%	14.1%	11.9%

Corporate bonds and government bonds have been modeled using the risk free yield curves and swaption volatilities shown above.

The following table shows the annualized implied volatilities of equity indices used in the EV calculation, derived from the simulations used in the calculation. These figures are based on at-the-money-forward European options on capital indices, consistent with traded options in the market.

Table 5.3							
as of December 31, 2006		1 Year	2 Year	5 Year	10 Year	20 Year	40 Year
<b>At-the-money-forward equity implied volatility (capital index)</b>	<b>Index</b>						
	United States (S&P 500)	15.4%	15.7%	16.8%	20.2%	25.2%	30.0%
	United Kingdom (FTSE 100)	14.1%	14.9%	17.2%	21.2%	23.7%	26.8%
	Euro Zone (Eurostoxx)	17.0%	18.0%	20.4%	22.9%	26.7%	30.3%
	Switzerland (SMI)	14.4%	14.8%	16.5%	19.3%	22.0%	24.7%

The model also makes assumptions regarding the volatility of property investments, estimated from relevant historic return data. Based on the actual simulations used, the following implied volatilities arise:

Table 5.4

as of December 31, 2006

**At-the-money-  
forward property  
implied volatility  
(capital index)**

	1 Year	2 Year	5 Year	10 Year	20 Year	40 Year
<b>Economy</b>						
United States	15.5%	15.5%	15.5%	16.9%	18.7%	22.0%
United Kingdom	16.2%	16.3%	17.7%	17.3%	17.8%	18.7%
Euro Zone	15.0%	14.8%	15.4%	16.0%	17.8%	21.5%
Switzerland	15.7%	15.6%	16.0%	17.0%	18.3%	20.1%

### Inflation

Inflation assumptions have been derived from the yields on index linked bonds relative to the risk free yield curve, where index linked bonds exist. Elsewhere, a statistical approach based on past inflation has been used.

Appropriate allowance has been made for expense inflation to exceed the assumed level of price inflation as life company expenses include a large element of salary related expenses.

The following table shows inflation assumptions for the stochastically modeled economies, derived from the simulations used in the EV:

Table 5.5

as of December 31, 2006

**Inflation  
assumptions  
(annualised  
forward inflation)**

	1 Year	2 Year	5 Year	10 Year	20 Year	40 Year
<b>Economy</b>						
United States	2.3%	2.2%	2.2%	2.3%	2.5%	2.8%
United Kingdom	2.5%	2.6%	2.8%	2.9%	3.0%	3.3%
Euro Zone	1.8%	2.0%	2.1%	2.1%	2.2%	2.1%
Switzerland	0.8%	1.0%	1.1%	1.1%	1.3%	1.4%

### Risk discount rate

Under the "risk neutral" approach, risk discount rates are based on the same risk free yield curves as those used to project the investment return.

For stochastic modeling, the risk discount rates are simulation specific and also vary by calendar year consistently with the projected risk free yields in each simulation.

### "Expected return" for the analysis of movement – Investment return assumptions

The expected return for the analysis of movement is based on a projection from beginning of period to end of period. This requires assumptions regarding the investment returns expected to be achieved over the period on different asset classes. The investment return assumptions (for this purpose only) are based on the "real world" returns expected by Zurich. The use of real world investment assumptions gives a more realistic basis for the expected return calculation.

For fixed interest assets, the "real world" investment return assumptions are based on the gross redemption yield on the assets, less an allowance for defaults where appropriate, together with an adjustment to reflect the change over the year implied in the yield curve assumptions.

For equity and property assets, the investment return assumptions are based on the 10 year swap rate at the beginning of period plus a margin to reflect the additional risk associated with investment in these asset classes.

These assumptions have been set by asset class and separately for each sub-fund in each life business in order to best reflect the actual assets held.

**Participating business**

Rates of future bonus or crediting rates have been set at levels consistent with the risk neutral investment return assumptions and current bonus plans. In the UK, bonus rates have been set so as to exhaust any remaining assets in the relevant long-term funds. In other European life businesses and in the US, bonuses have been set to be consistent with the investment return assumptions and with the book value approach used by these life businesses in practice.

**Taxation**

Current tax legislation and rates have been assumed to continue unaltered, except where changes in future tax rates or practices have been announced.

**Exchange rates**

EV for December 31, 2006 and 2005 have been translated using the respective balance sheet exchange rates. The analysis of movements, including new business, has been translated at December 31, 2005 balance sheet exchange rates.

**b) Operating assumptions****Demographic assumptions**

The assumed future mortality, morbidity and lapse rates have been derived from recent operating experience. Where appropriate, surrender and option take-up rate assumptions that vary according to the investment simulation under consideration have been used, based on our assessment of likely policyholder behavior.

**Expense assumptions**

Management expenses have been analyzed between expenses related to acquisition of new business, the maintenance of in-force business and, where appropriate, one-off project costs. Future expense assumptions allow for expected levels of maintenance expenses. In addition, Corporate Center expenses relating to covered business have been allocated to business units and are reflected in assumed future expenses.

The maintenance expense assumptions allow for the expected cost of providing future service benefits in respect of the Group staff pension schemes. Consistent with the treatment of not including any past service pension scheme surpluses within the EV, no allowance is made in the expense assumptions for any contributions as a result of past service benefits.

No allowance has been made for future productivity improvements in the expense assumptions.

None of the life companies included in the EV is considered to be in a "start-up" situation and so no allowance has been made for future development expenses.

Where service companies have been valued on a look through basis, the value of profits or losses arising from these services have been included in the EV and the new business value.

**c) Dynamic decisions**

To reflect more realistically the outcome in stochastic simulations, the assumptions for each simulation make allowance for the actions that policyholders and management are expected to take in response to the investment conditions modeled.

In many life businesses, policyholders can exercise an option against the life company in certain circumstances, such as to surrender a policy. This then leads to an increase in the assumed lapse rates when interest rates rise (or a corresponding reduction when interest rates fall). This dynamic effect in relation to lapse rates has been allowed for in the stochastic models.

As investment conditions change, where a business unit's investment policy indicates that Management would expect to alter the investment portfolio (e.g. the mix between equities and fixed interest for profit sharing sub-funds), this expected action has been included in the stochastic models.