MCEV modelling considerations

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Note that technical definitions can be found at the end of Old Mutual's 2008 Report and Accounts

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Methodology of earnings analysis under MCEV

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Analysis of MCEV earnings

- Provides a reconciliation of the MCEV for covered business at the beginning of the reporting period and the MCEV for covered business at the end of the reporting period

- MCEV earnings generated by:

  - Value of new business (VNB)

  - Expected existing business contribution (expected 'unwind' of the MCEV)

    - Risk free reference rate (swap rate, plus a liquidity premium for some business)

    - In excess of risk free reference rate (additional "real-world" returns)

  - Operating experience variances (e.g. persistency experience)

  - Operating assumption changes (e.g. mortality changes)

  - Other operating variances (e.g. model improvements)

  - Economic variances (e.g. change in swap yields)

  - Other non-operating variances (e.g. change in regulations)

- Closing adjustments (e.g. dividends paid to Group)

Operating MCEV earnings

'Below the line'

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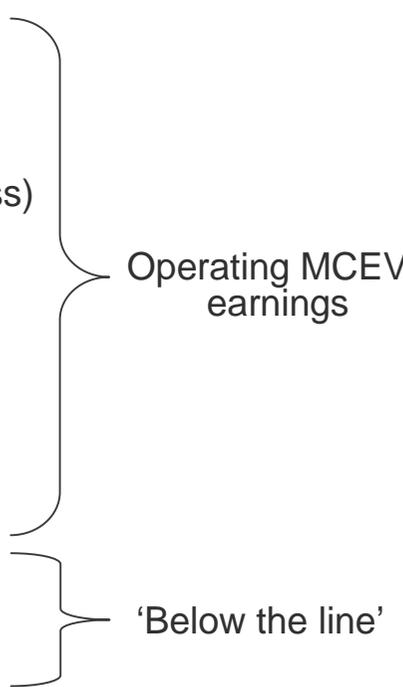
Analysis of MCEV earnings (cont.)

- VNB takes into account new business strain on free surplus that arises, from the impact of initial expenses and additional required capital that should be held in respect of such new business

- Expected existing business contribution is determined by projecting assets and liabilities (e.g. as recorded in annual financial statements and statutory returns) from the start of the reporting period to the end of the reporting period using expected "real-world" rates of return. Presented in two components:

  - Expected earnings on free surplus and required capital and the expected change in value in force (VIF) assuming that the assets earn risk free reference rates prevailing at the beginning of period, for the period; and

  - Additional expected earnings on free surplus and required capital and the additional expected change in VIF as a result of "real-world" expected earned rates of return on assets in excess of the risk free reference rates assumed above

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Expected existing business contribution – simplistic example

<u>Assumptions</u>

- Market value of assets (all invested in equities) at start of year = 100
- Market value of liabilities of 100 to be paid in 3 year's time, discounted at risk free reference rate of 7%, at start of year = 100 / ((1.07)^3) = 82
- Assumed real-world equity risk premium (in excess of risk free reference rate) = 3%
- Actual equity risk premium (in excess of risk free reference rate) earned over the year = 13%

	Market Value of Assets	Market Value of Liabilities	MCEV (Assets – Liabilities)
Opening	100	$100 / (1.07)^3 = 82$	100 – 82 = 18
Expected existing business contribution (risk free reference rate)			2
Expected at end of year assuming risk free returns	100 x (1.07) = 107	$100 / (1.07)^2 = 87$	107 – 87 = 20
Expected existing business contribution (excess of risk free reference rate)			3
Expected at end of year assuming additional real world returns	100 x (1.07+0.03) = 110	$100 / (1.07)^2 = 87$	110 – 87 = 23
Economic Variances			10
Actual at end of year	100 x (1.07+0.13) = 120	$100 / (1.07)^2 = 87$	120 – 87 = 33

Growth in MCEV

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Expected asset returns in excess of risk free reference rates

- Only impact of expected asset returns in excess of risk free reference rates on MCEV is on the calculation of the expected existing business contribution (in excess of risk free reference rates) in the analysis of MCEV earnings

- Such real-world economic assumptions are determined with reference to one-year forward risk free reference rates applicable to the currency of the liabilities at the start of the reporting period

- Equity and property risk premiums incorporate both historical relationships and the directors' view of future projected returns in each geography

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Analysis of MCEV earnings (cont.)

- Transfers from VIF and required capital to free surplus includes the release of required capital and modeled profits from VIF into free surplus in respect of business that was in-force at the beginning of the reporting period, although the movement does not contribute to a change in the MCEV (this is often referred to as the monetisation of profits in the in force book")

- Operating experience variances reflect the impact of deviations of the actual operational experience during the reporting period from the expected operational experience

  - Analysed before operating assumption changes, i.e. such variances are assessed against operating assumptions at start of reporting period for in-force business and operating assumptions at end of the reporting period for new business (as new business is calculated on operating assumptions at the end of the reporting period)

- Operating assumption changes incorporate the impact of changes to operating assumptions from those assumed at the beginning of the reporting period to those assumed at the end of the reporting period

- Other operating variances include model improvements, changes in methodology and the impact of certain management actions (e.g. a change in the asset allocation backing required capital)

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Analysis of MCEV earnings (cont.)

- Total MCEV earnings also include economic variances and other non-operating variances:

  - Economic variances incorporate:

    - The impact of changes in economic assumptions from the beginning of the reporting period to the end of the reporting period; and

    - The impact on earnings resulting from actual returns on assets being different to the expected returns on those assets as reflected in the expected existing business contribution - It therefore includes the impact of economic variances in the reporting period on projected future earnings (e.g. changes in equity markets having a direct impact on unit funds and expected present value of future management charges on those funds)

  - Other non-operating variances include the impact of changes in mandatory local regulations and changes in taxation etc

- Analysis of MCEV earnings requires closing adjustments in respect of exchange rate movements and capital transfers such as those in respect of payment of dividends and acquiring/divesting businesses

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Roll forward principles for modelling MCEV

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Consideration for additional disclosure from YE09

- Objective would be to make forecasting of MCEV easier for users of the MCEV statements

  - Expected existing business contribution for 12 months following the financial year-end (at the risk free reference rate as well as in excess of the risk free reference rate)
  - Expanding the level of detail on operating experience variances and operating assumption changes – possibly split results between risk, persistency, expenses and other

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Forecasting of elements of analysis of MCEV earnings

- VNB - expected sales volumes x expected margin

  - Expected sales volumes and impact of new business strain – requires judgement, but guided by quarterly sales and past experience

  - Expected margin could be estimated by adjusting previous disclosed margin for changes in operating and economic conditions using published sensitivities

    - PVNBP margin = VNB / present value of new business premiums (discounted at risk free reference rate)

    - APE margin = VNB / (new annual regular premiums + one tenth of new single premiums)

Forecasting of elements of analysis of MCEV earnings (cont.)

- Expected existing business contribution

    - Full year 2009 – anchored in same assumptions as HY09 but applied over the full period

    - From YE09 onwards

        - As mentioned earlier, from YE09 considering publishing for 12 months following the financial year-end (at the risk free reference rate as well as in excess of the risk free reference rate)

        - For interims could estimate as half of full year values

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Sensitivities

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Application of sensitivities

- Economic variances – make use of economic sensitivities to anticipate impact of changes in economic conditions

  - +1% / -1% change in economic conditions (eg, risk free swap rates)

  - +10% / -10% in equity markets

  - 25% increase in swaption volatilities (relevant to the time value of financial options and guarantees)

  - 25% increase in equity option volatilities (relevant to the time value of financial options and guarantees)

  } Required by CFO forum MCEV Principles & Guidance

  - Recognising additional 50% liquidity premium

  - Contraction on corporate bond spreads (changing from 10bps to 50bps from YE09)

  } Additional disclosure provided by Old Mutual

- Only +1% / -1% change in economic conditions and recognising additional 50% liquidity premium published at interims

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Common pitfalls when comparing to IFRS earnings

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Differences in IFRS and MCEV operating earnings

- IFRS - based on short term operating experience in reporting period and smoothed economic experience (through use of LTIR)

- MCEV – based on short term operating and economic experience in reporting period, **BUT ALSO** on changes in long term expectations of VIF, for example:

  - Persistency experience in reporting period reflected as part of operating experience variances

  - Changes in persistency assumptions for future years are capitalised as part of operating assumption changes

- Due to short term fluctuations, and differences in accounting treatment such as deferred acquisition costs, comparison of IFRS earnings multiples vs. MCEV VIF would not necessarily result in meaningful comparability

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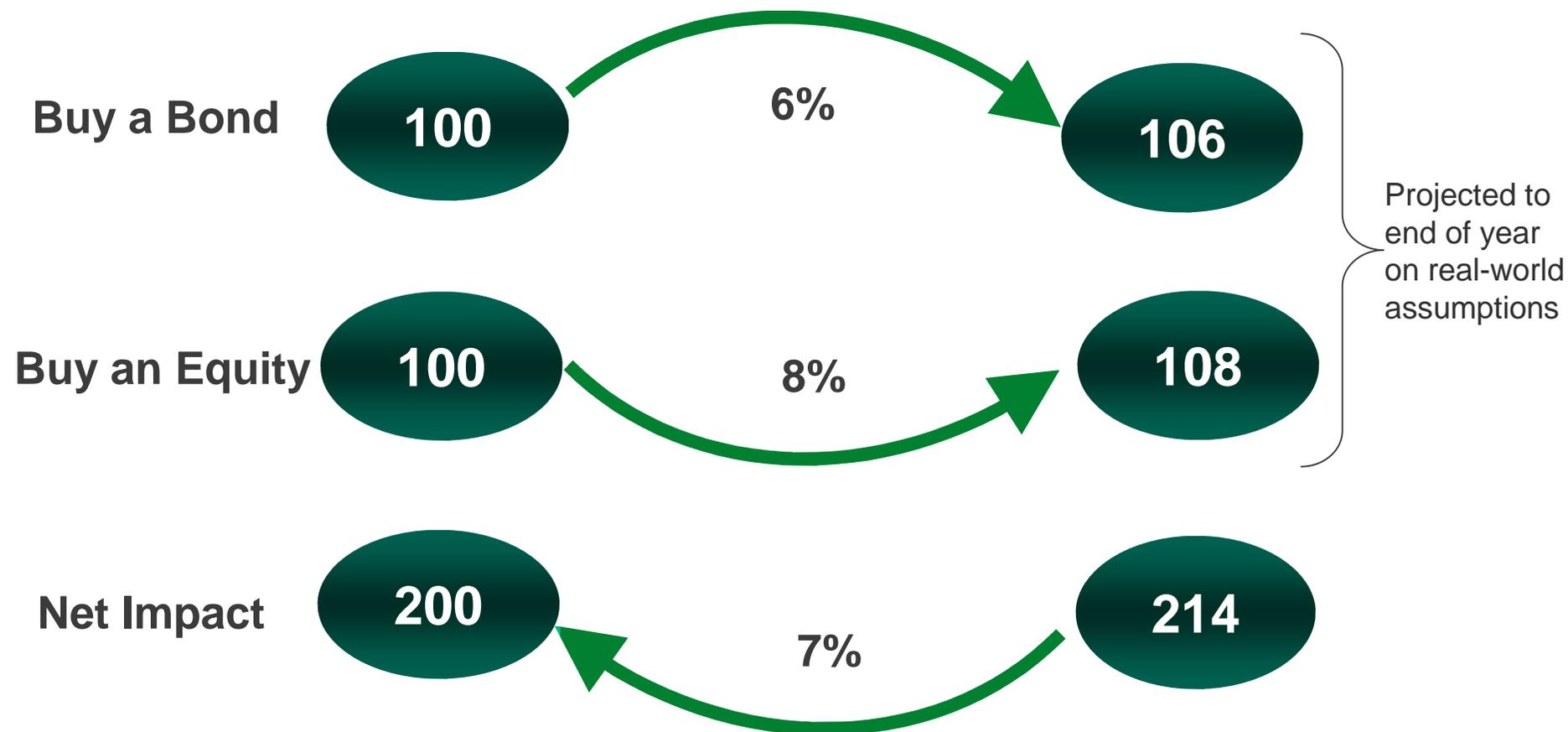# Appendix A - Economic assumptions

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Economic assumptions for MCEV valuation

- An active basis is applied to set pre-tax investment and economic assumptions (such as swap rates and asset class volatilities) to reflect the economic conditions prevailing on the reporting date

- Economic assumptions are set consistently, for example future bonus or crediting rates are set at levels consistent with the investment return assumptions

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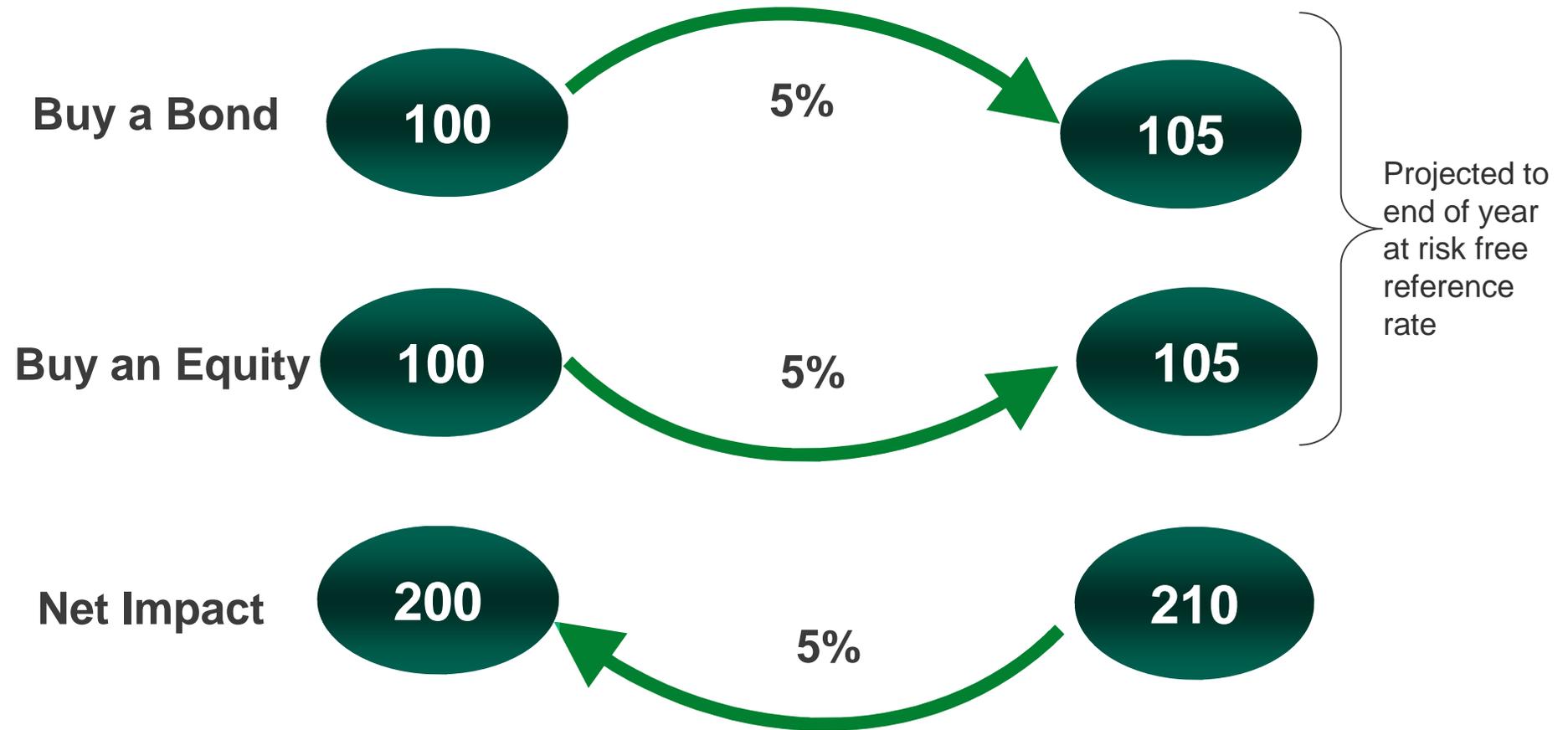# Economic assumptions for MCEV valuation (cont.)

- Under a market consistent valuation, economic assumptions are determined such that projected cash flows are valued in line with the prices of similar cash flows that are traded on the capital markets (e.g. swaps)

    - In theory, risk free cash flows are discounted at a risk free reference rate and equity cash flows at an equity rate

    - In practice for the calculation of the present value of future profits (PVFP), where cash flows do not depend on or vary linearly with market movements, a certainty equivalent method is used which assumes that actual assets held earn, before tax and investment management expenses, risk free reference rates and all the cash flows are discounted using risk free reference rates which are gross of tax and investment management expenses

    - The deterministic certainty equivalent method is purely a valuation technique and over time the expectation is still that risk premiums will be earned on assets such as equities and corporate bonds (see example that follows)

    - Stochastic analysis (taking into account variability of future economic conditions) is used to value the time value of financial options and guarantees

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Theoretical approach to providing for financial risk

Buy a Bond 100 → 6% → 106

Buy an Equity 100 → 8% → 108

Projected to end of year on real-world assumptions

Net Impact 200 ← 7% ← 214

- Either need to apply different discount rates to different sets of cash flows to reflect underlying risks inherent in each cash flow; or
- Back solve theoretical weighted average discount rate for aggregate cash flows
- Too complex and time consuming in practice

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"Certainty equivalent" approach

Buy a Bond 100 → 5% → 105

Buy an Equity 100 → 5% → 105

Projected to end of year at risk free reference rate

Net Impact 200 ← 5% ← 210

- Future investment returns and discount rates are assumed to be that of a 'risk free' investment
- Not what we actually expect to happen, but a mathematical solution to get the right answer while making the calculations easier

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"Real-world" economic assumptions

- No bearing on the calculated MCEV other than the calculation of the expected existing business contribution in the analysis of MCEV earnings

  - Additional expected earnings on free surplus, required capital and the additional expected change in VIF as a result of "real-world" expected earned rates of return on assets in excess of the risk free reference rate return at the beginning of period

- Pre-tax assumptions determined with reference to one-year forward risk free reference rates applicable to the currency of the liabilities at the start of the reporting period

  - Equity risk premium - 3.5% for Africa and 3% for Europe and the US

  - Cash return - one-year swap rate less 2% for Africa and 1% for Europe and US

  - Corporate bond return - based on actual corporate bond spreads on the reporting date less an allowance for defaults

  - Property risk premium - 2.5% for Africa and 2% for Europe

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Appendix B – Guide to historic approximation of expected existing business contribution

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Historic approximation of expected existing business contribution

- In past could have estimated as follows:

  - Risk free 'reference rate'

    - Interims : {Opening MCEV value x one-year risk free reference rate at start of period} / 2 (similar to unwinding of VIF at risk discount rate under EEV)

    - Full year : Interims value x 2

  - 'In excess of risk free reference rate'

    - Interims : Use combination of (a) ratio between 'risk free reference rate' and 'excess' in previous financial year and (b) change in assumed weighted average risk premium

    - Full year : Interims value x 2

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Historic approximation of expected existing business contribution (cont.)

- Limitations to historic approximations of expected existing business contribution

  - Unwinding of time value of financial options and guarantees based on deterministic roll-forward (i.e. single "real-world" scenario in reporting period rather than stochastic scenarios)

  - Unwinding of frictional costs in VIF and expected frictional costs recognised in ANW

    - Frictional costs on required capital is combination of taxation on investment return (income and capital gains) and investment costs on the assets backing the required capital for covered business

  - Unwinding of Cost of Non-Hedgeable Risks ("CNHR") in VIF
    - The CNHR is calculated using a cost of capital approach, i.e. it is determined as the present value of capital charges for all future non-hedgeable risk capital requirements until run-off of the liabilities

  - Large negative VIF for US business (with guarantees biting) with material "real-world" returns expected in future as corporate bond spread are realised – alternative approximation required for "in excess of risk free reference rate"

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Historic approximation of expected existing business contribution (cont.)

- Historic approximation of expected existing business contribution - US VIF

    - YE08 script of MCEV presentation - "...if we had done an EEV calculation at the end of December we probably would have ended up with an EEV in the range of somewhere around 150p per share."

    - Relative to adjusted Group MCEV per share at YE08 of 118p, it implies increase to US VIF of £1.7bn on EEV basis

        - VIF on MCEV basis = -£2.1bn

        - Implied VIF on EEV basis = -£0.4bn

    - Ultimate value realised under MCEV and EEV should be equal. Assume that negative VIF of -£2.1bn on MCEV basis will be clawed back and eliminated over time as corporate bond spreads are realised

        - Need to make assumption about speed of claw back of VIF - Given duration of liabilities of approximately 6 years, could for example assume claw back period of say 15 years with claw back rate diminishing over time

        - Assumed that in year 1 the proportion of the gap closed is 15/(1+2+...+14+15), in year 2 the proportion of the gap closed is 14/(1+2+...+14+15),..., and in year 15 the proportion of the gap closed is 1/(1+2+...+14+15)

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