

# AXA EQUITABLE - VARIABLE PRODUCT GUARANTEED BENEFITS & HEDGING CONSIDERATIONS

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August 8, 2005



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# Variable Annuity Product Evolution

## 1970's-1980's: Fixed Annuities

- Tax-deferred returns
- Death benefit returns principal prior to annuitization

## 1980's-1990's: Variable Annuities

- Equity upside with tax-deferred returns on mutual fund clones
- Return of premium death benefit

## 1995-1997: VA with Enhanced Death Benefits

- Ratchet resets the guarantee to account value
- Roll-up at guaranteed rate

## 1996-2000: Living Benefits – Generation I

- GMIB guarantees an account level that can be annuitized
- GMAB guarantees an account value that can be withdrawn

## 2002: Living Benefits – Generation II

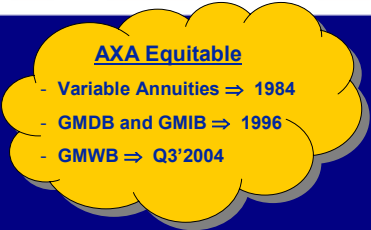
- GMWB limits downside risk; offers upside of equities

## 2003: Living Benefits – Generation III

- GMWB with ratchets, rollup and/or higher withdrawal max

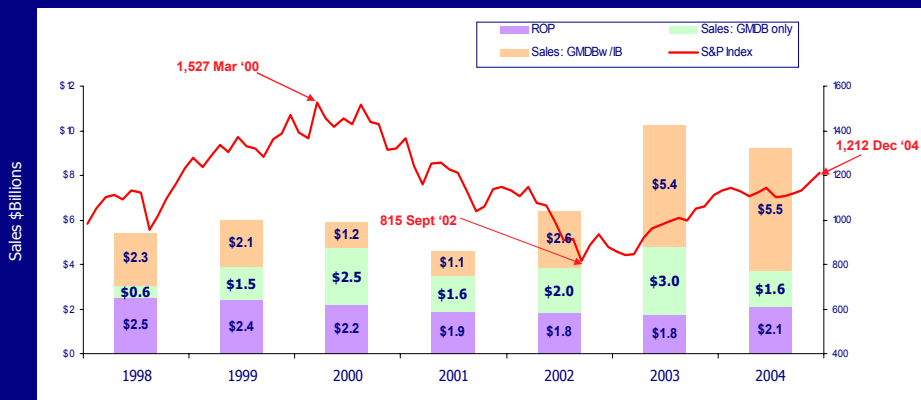
## 2004: Living Benefits – Generation IV

- Hybrid GMWB/GMIB
- Immediate annuity products



# Risk Management - Allows product continuity to market

AXA Equitable – Variable Annuity Sales



- Demand for Guaranteed Benefits increased as the markets declined.
- At the same time, reinsurance capacity became more scarce & expensive.
- As a result, many insurers began to develop internal hedging capabilities.



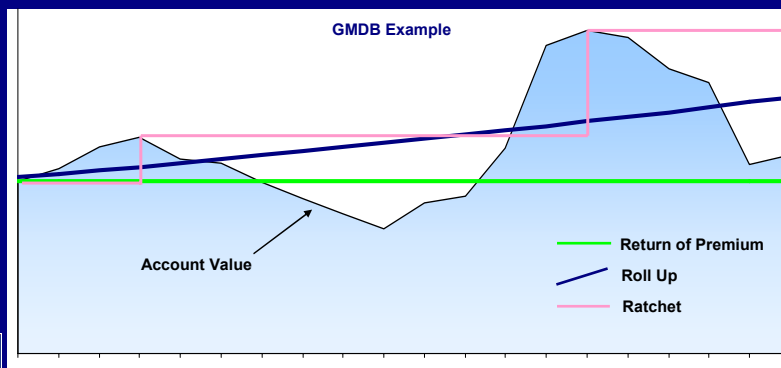
# Variable Annuity Product Guarantees

- Variable annuities have sophisticated guarantees
  - **Guaranteed Minimum Death Benefit (GMDB)** – guarantees a flat or contractually increasing death benefit (return of premium, Roll-up and ratchet)
  - **Guaranteed Minimum Income Benefit (GMIB)** – guarantees a minimum income when annuitization option is elected
  - **Guaranteed Minimum Withdrawal Benefit (GMWB)** – guarantees principal and allows set percentage of withdrawal each year, even if account value is zero
- Guaranteed Benefits – Embedded put options
  - Policyholder option value increases as the markets and policy account values decrease
  - Stochastic modeling used to value options
  - “Greeks” measure risk dimension of the option positions
  - Changes in option value due to market movement and policyholder behavior
    - Models assume people will maximize benefits, e.g. lapses decrease as benefits become more “in-the-money”



# GMDB – Death Benefit Options

- **Return of Premium:** higher of total premium or account value, adjusted for withdrawals
- **Roll-up:** premiums paid accumulated at guaranteed rate, adjusted for withdrawals
- **Ratchet:** highest account value at contract anniversary dates, adjusted for withdrawals
- **“Greater of” Ratchet or Roll-up:** greater of annual ratchet or roll-up amount



# GMB guarantees minimum annual income when annuitization option elected

- Guaranteed Minimum Income **Benefit** calculated based upon **Benefit Base**
- Benefit Base is the greater of 6% annual roll-up of initial premium and annual ratchet (maximum anniversary account value), adjusted for withdrawals, up to certain attained age
- Benefit Base is not an annuity account value - only used to calculate guaranteed annual income if policyholder elects to annuitize after waiting period
- Benefit "in-the-money" when guaranteed benefit exceeds what Account Value could purchase at the then current interest environment

Purchased at Age 55			Annual Income at election (at various interest rate levels and Account Value)						
Age Male	Benefit Base *	Guaranteed Minimum Income Benefit	Guaranteed Annual Annuity at given age for \$100,000	Current					
				Age 65 AV	-150bps	-75bps	Rate	+75bps	+150bps
55	\$ 100.0	\$0.0	}						
65	\$ 179.1	\$9.7		145.0	9.7	10.4	11.2	12.0	12.8
70	\$ 239.7	\$14.2		134.5	9.0	9.7	10.4	11.1	11.9
75	\$ 320.7	\$20.5		125.1	8.3	9.0	9.7	10.4	11.1
			116.8	7.8	8.4	9.0	9.7	10.3	
			109.4	7.3	7.9	8.5	9.1	9.7	
				GMB "in-the-money" - Policyholder should elect					
				GMB "out-the-money" - Policyholder should not elect					



# Dynamic Hedging - Business Objectives

- Dynamic Hedging process designed to accumulate assets to meet future claims from policyholder options
- Isolate Dynamic Hedging as a "business"
  - Guaranteed benefits added to help sell variable annuities
  - Annual guaranteed benefit charges fund dynamic hedging program
- Mitigate economic exposure and P&L volatility
  - Accounting and economics should converge
- Dynamic Hedging assets consist of accumulated funds available to pay guaranteed benefit claims

$$\begin{aligned}
 &+ \text{ Policyholder charges} \\
 &+ \text{ gain/(loss) on Futures} \\
 &+ \text{ accumulated interest} \\
 &- \text{ claims paid} \\
 \hline
 &= \text{ change in aggregate value of benefits}
 \end{aligned}$$





## Life Insurance - No Lapse Guarantee

- The no lapse guarantee insures that the policy will remain in force under any interest rate or equity scenario subject to certain minimum premium requirement
- Secondary guarantees on life insurance (NLG) are substantially different from annuity GMDB/IB features
- Life insurance NLG require a certain level of premium payments under a specified premium or shadow fund design
  - Annuity guarantees require no future premiums
- Life insurance products always contain mortality risk
  - Annuity products develop mortality risk only when the guarantee is in the money



## Life Insurance - No Lapse Guarantee

- Increasing levels of statutory reserves on Universal Life and Level Term products
- Economic risk is minor compared to solvency risk for large writers
- Industry approaches to comply with the requirement:
  - Absorbing current reserve strain but will need to address future reserve implications
  - Buying reinsurance-expensive
  - Finance the reserve requirement with Letter of Credit, but capacity will be an industry issue
  - Raise capital in the financial markets through securitization



## Comparison of Illustrative Stock Company NLG and Mutual Company Dividend Paying Products Currently Available in the Market

Male Best Class \$1 million issued

<u>Issue Age</u>	<u>Dividend</u>	<u>NLG</u>
35	\$11,070	\$5,214
45	18,480	7,571
55	32,050	11,319



## External Business Environment

### "Who's Influencing the Industry"

- Federal Regulators
- State Insurance Departments
- State Attorney Generals
- NASD
- SEC
- Legal Bar
- Rating Agencies
- Life Settlements

### "What is Their Focus"

- Supervisory Issues
- Market Timing
- Late trading
- Valuation
- Suitability, replacements & exchanges of Var. Life & Annuity products
- Finite risk reinsurance
- Collusive bidding
- Revenue Sharing
- Brokerage & Networking arrangements



**Thank You**



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