



 **ERNST & YOUNG**

Quality In Everything We Do

Enhanced Embedded Values

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Enhanced Embedded Values

- § EV history
- § Issues with traditional EVs
- § European Embedded Values
- § Market Consistent Embedded Values (MCEV)
- § Questions/comments

EV History – Part 1

- § Developed through late 80s/early 90s as realistic valuation measure
- § Profit measure from mid 90s – accruals then achieved profits
- § Internal management reporting
- § Some convergence of methodologies across companies

EV History – Part 1

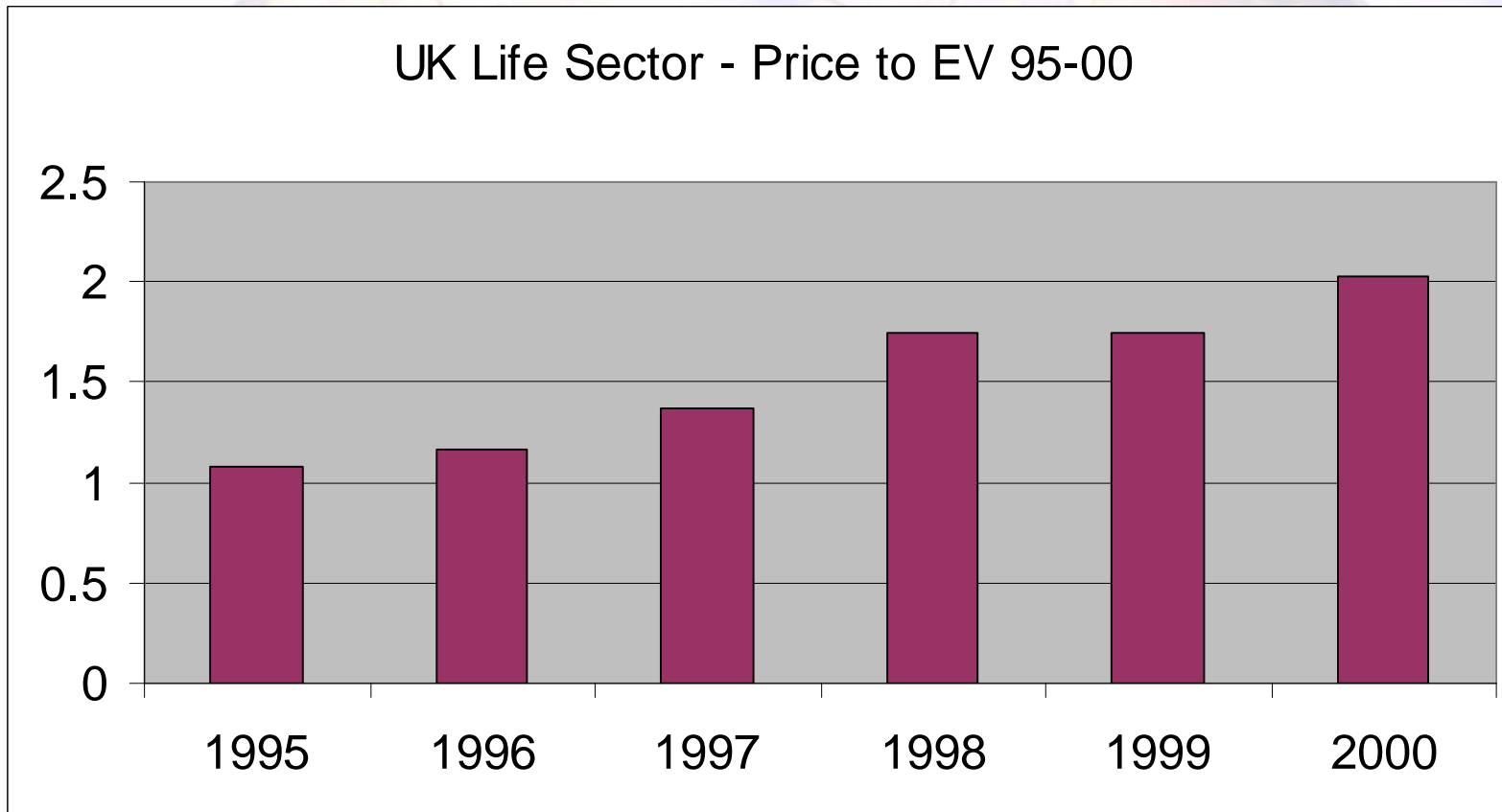
Drivers for EV reporting:-

§ More realistic

§ Profit drivers

§ Value added by current management

EV History – Part 1

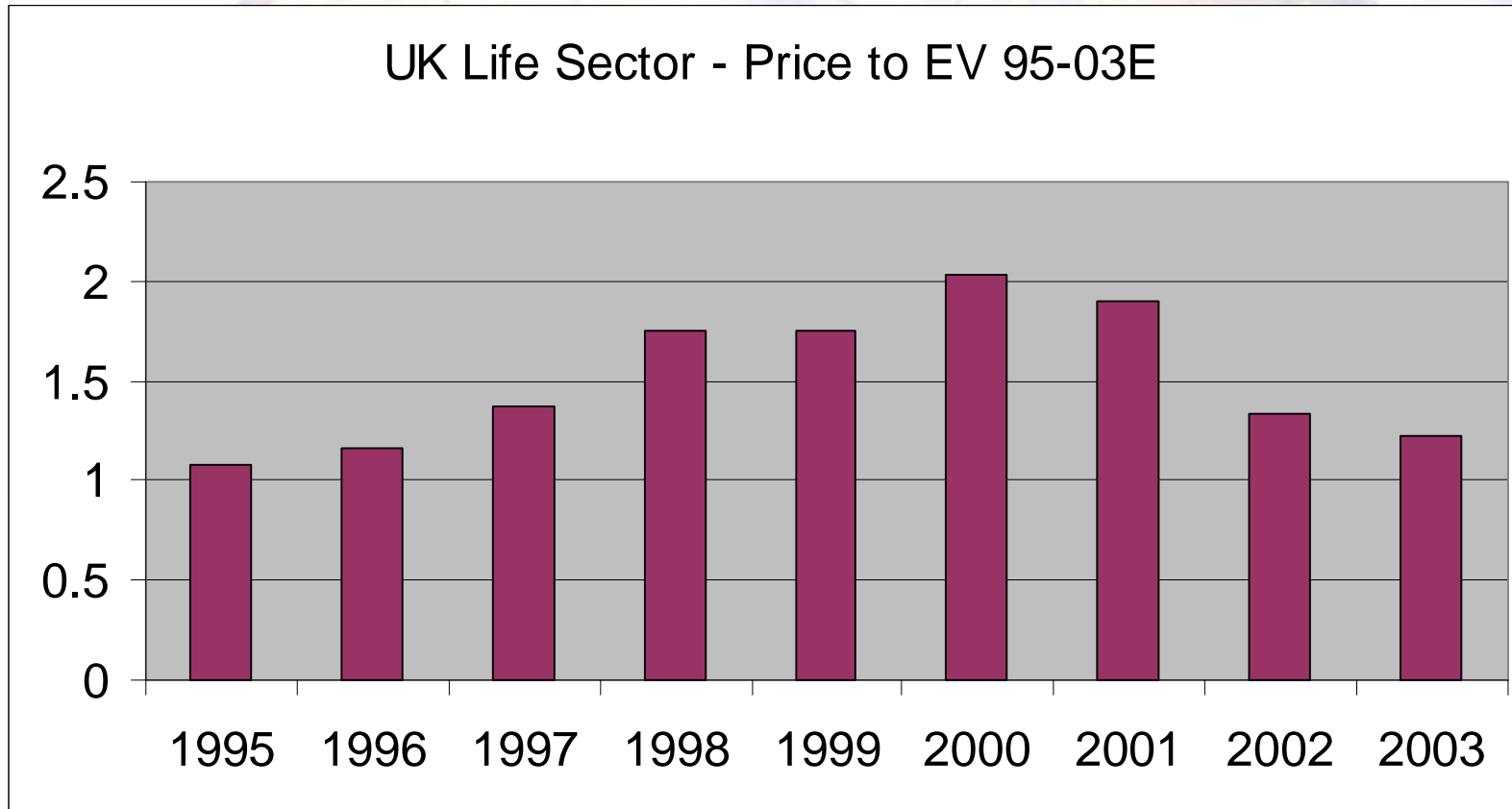


Source: Citigroup

EV History – Part 2

- § Equity market falls from 2000
- § Low interest rates uncovered guarantees
- § Highlighted weaknesses
- § Less confidence in EVs

EV History – Part 2



Source: Citigroup

Weaknesses in EV

- § Single discount rate
- § Capitalisation of investment margins
- § Options and guarantees
- § Cost of capital
- § Still a lack of consistency between companies

Embedded Value – Example

§ 5 Year UWP SP Bond

§ Premium = 1000

§ Ignore Lapses / Mortality / Sterling Reserves / Tax

§ Best Estimate Investment return is 7%

– 50% Equities, 50% Gilts; Equity Return 8%; Gilt Return 6%

§ Discount rate is 8%

§ 1.5% AMC, no other charges

§ Return of premium guarantee after 5 years

Embedded Value – Example

| Year | 1 | 2 | 3 | 4 | 5 |
|-----------------------------|-------|-------|-------|----------------------|-------|
| Premium | 1,000 | 0 | 0 | 0 | 0 |
| Asset Share (Start of Year) | 1,000 | 1,054 | 1,111 | 1,171 | 1,234 |
| Gross Investment Return | 70 | 74 | 78 | 82 | 86 |
| AMC | 16 | 17 | 18 | 19 | 20 |
| Asset Share (End of Year) | 1,054 | 1,111 | 1,171 | 1,234 | 1,300 |
| Cost of Gtee | 0 | 0 | 0 | 0 | 0 |
| AMC | 16 | 17 | 18 | 19 | 20 |
| Expenses | 10 | 10 | 10 | 10 | 10 |
| PV Cost of Gtee | 0 | | | | |
| PV AMC | 71 | | | | |
| PV Expenses | 40 | | | | |
| | | | | NBAV (Point of Sale) | 31 |

Embedded Value – Example (100% Equities)

| Year | 1 | 2 | 3 | 4 | 5 |
|-----------------------------|-------|-------|----------------------|-------|-------|
| Premium | 1,000 | 0 | 0 | 0 | 0 |
| Asset Share (Start of Year) | 1,000 | 1,064 | 1,132 | 1,204 | 1,281 |
| Gross Investment Return | 80 | 85 | 91 | 96 | 102 |
| AMC | 16 | 17 | 18 | 20 | 21 |
| Asset Share (End of Year) | 1,064 | 1,132 | 1,205 | 1,280 | 1,362 |
| Cost of Gtee | 0 | 0 | 0 | 0 | 0 |
| AMC | 16 | 17 | 18 | 20 | 21 |
| Expenses | 10 | 10 | 10 | 10 | 10 |
| PV Cost of Gtee | 0 | | | | |
| | | | NBAV (Point of Sale) | | 33 |
| PV AMC | 73 | | | | |
| PV Expenses | 40 | | | | |

Comparison of Results

| | EV 50% Gilts 50% Equities | EV 0% Gilts 100% Equities | EEV 50% Gilts 50% Equities | EEV 0% Gilts 100% Equities | MCEV 50% Gilts 50% Equities | MCEV 0% Gilts 100% Equities |
|--|--|--|---|---|--|--|
| Embedded Value (Intrinsic Value) | 31 | 33 | | | | |
| Allowance for Value of Guarantees | 0 | 0 | | | | |
| Total Embedded Value | 31 | 33 | | | | |

CFO Forum

- § Formed in 2002
- § European EV Principles published May 2004
- § Agreed to publish results from YE 2005, but some companies publishing earlier.

Aegon Allianz Generali AXA Aviva Fortis Skandia Hannover Re
ING Legal & General Munich Re Old Mutual Prudential
Scottish Widows Standard Life Swiss Re
Swiss Life Winterthur Zurich Financial Services

European EV - Key Improvements

- § Changes to allowance for cost of capital
- § Allowance for financial options and guarantees
- § Definitions of new business tightened
- § Service company treatment / holding company costs
- § Additional disclosure required
- § Standardisation between companies

Definition of Capital

Principle 5

- § Defines encumbered capital
- § May include risk based capital
- § Introduces possible inconsistencies

Allowance for Financial Options

Principle 7

- § Time Value of Financial Options and Guarantees
- § Stochastically modelled
- § Consistent with underlying intrinsic value in EV

Definitions of New Business

Principle 8

- § Defines new business
- § Includes value of renewals from that business
- § Regular Single Premiums, contractual premium increases included
- § EV should excluded future new business

Service Companies and Expenses

Principle 9

- § Non-economic assumption setting
- § Based on past and future expected experience
- § Look through service company arrangements
- § Allow for holding company expenses

Disclosure

Principle 2

§ Covered business disclosed

Principle 12

§ Embedded Value disclosed at group level

Embedded Value – Example

§ 5 Year UWP SP Bond

§ Premium = 1000

§ Ignore Lapses / Mortality / Sterling Reserves / Tax

§ Best Estimate Investment return is 7%

– 50% Equities, 50% Gilts; Equity Return 8%; Gilt Return 6%

§ Discount rate is 8%

§ 1.5% AMC, no other charges

§ Return of premium guarantee after 5 years

European Embedded Value – Example

| Year | 1 | 2 | 3 | 4 | 5 |
|-----------------------------|-------|-------|----------------------|-------|-------|
| Premium | 1,000 | 0 | 0 | 0 | 0 |
| Asset Share (Start of Year) | 1,000 | 1,054 | 1,111 | 1,171 | 1,234 |
| Gross Investment Return | 70 | 74 | 78 | 82 | 86 |
| AMC | 16 | 17 | 18 | 19 | 20 |
| Asset Share (End of Year) | 1,054 | 1,111 | 1,171 | 1,234 | 1,300 |
| Cost of Gtee | 0 | 0 | 0 | 0 | 0 |
| AMC | 16 | 17 | 18 | 19 | 20 |
| Expenses | 10 | 10 | 10 | 10 | 10 |
| PV Cost of Gtee | 0 | | NBAV (Point of Sale) | | 31 |
| PV AMC | 71 | | Value of Guarantees | | ? |
| PV Expenses | 40 | | ENBAV | | ? |

Determining the Time Value of Guarantees

Run 1
Deterministic
Policy by Policy Data

$VIF_2 - VIF_1 =$ Model
point Grouping Error

Run 2
Deterministic
Grouped model point data

Run 3
Stochastic
Grouped model point data

$VIF_3 - VIF_2 =$ Time
Value of Guarantees

$$VIF = VIF_1 - (VIF_3 - VIF_2)$$

European Embedded Value – Example

Good Scenario (15% Investment Return)

| | | | |
|-----------------|----|----------------------|----|
| PV Cost of Gtee | 0 | NBAV (Point of Sale) | 48 |
| PV AMC | 88 | | |
| PV Expenses | 40 | | |

Bad Scenario (-1% Investment Return)

| | | | |
|-----------------|----|----------------------|------------|
| PV Cost of Gtee | 80 | NBAV (Point of Sale) | (64) |
| PV AMC | 56 | | |
| PV Expenses | 40 | Average NBAV | (8) |

| | |
|------------------------------|------------|
| NBAV (Point of Sale) | 31 |
| Impact of Guarantee | (39) |
| ENBAV (Point of Sale) | (8) |

EEV – Example (100% Equities)

| Year | 1 | 2 | 3 | 4 | 5 |
|-----------------------------|-------|-------|----------------------|-------|-------|
| Premium | 1,000 | 0 | 0 | 0 | 0 |
| Asset Share (Start of Year) | 1,000 | 1,064 | 1,132 | 1,204 | 1,281 |
| Gross Investment Return | 80 | 85 | 91 | 96 | 102 |
| AMC | 16 | 17 | 18 | 20 | 21 |
| Asset Share (End of Year) | 1,064 | 1,132 | 1,205 | 1,280 | 1,362 |
| Cost of Gtee | 0 | 0 | 0 | 0 | 0 |
| AMC | 16 | 17 | 18 | 20 | 21 |
| Expenses | 10 | 10 | 10 | 10 | 10 |
| PV Cost of Gtee | 0 | | NBAV (Point of Sale) | | 33 |
| PV AMC | 73 | | Value of Guarantees | | ? |
| PV Expenses | 40 | | ENBAV | | ? |

EEV Example (100% Equities)

Good Scenario (20% Investment Return)

| | | | |
|-----------------|-----|--------------------|----|
| PV Cost of Gtee | 0 | EV (Point of Sale) | 60 |
| PV AMC | 100 | | |
| PV Expenses | 40 | | |

Bad Scenario (-4% Investment Return)

| | | | |
|-----------------|-----|--------------------|-------------|
| PV Cost of Gtee | 166 | EV (Point of Sale) | (154) |
| PV AMC | 52 | | |
| PV Expenses | 40 | Average EV | (47) |

| | |
|------------------------------|-------------|
| NBAV (Point of Sale) | 33 |
| Impact of Guarantee | (80) |
| ENBAV (Point of Sale) | (47) |

Comparison of Results

| | EV 50% Gilts 50% Equities | EV 0% Gilts 100% Equities | EEV 50% Gilts 50% Equities | EEV 0% Gilts 100% Equities | MCEV 50% Gilts 50% Equities | MCEV 0% Gilts 100% Equities |
|---|--|--|---|---|--|--|
| New Business Added Value (Intrinsic Value) | 31 | 33 | 31 | 33 | | |
| Allowance for Value of Guarantees | 0 | 0 | (39) | (80) | | |
| Total New Business Added Value | 31 | 33 | (8) | (47) | | |

European EV – Weaknesses

- § Not widely adopted in the UK
- § Economic framework largely unchanged
- § Allowance for financial options is not consistent with financial economics

MCEV – Key Features

- § Market risk profits not booked until earned
- § Market consistent value of options and guarantees
- § No risk premium for diversifiable (generally non-market) risks
- § Cost of capital reflected more directly
 - Double taxation
 - Agency costs

MCEV – Derivation

- § More direct approach
- § Market value of assets
- § Deduct market consistent value of liabilities, including options/guarantees
- § Deduct cost of capital

MCEV – Reconciliation to TEV

TEV

Add back cost of capital (TEV)

Change risk discount rate to risk free

Remove investment margins on risky assets

Introduce market consistent cost of financial options and guarantees

Deduct cost of capital (MCEV)

MCEV

MCEV – Example

§ 5 Year UWP SP Bond

§ Premium = 1000

§ Ignore Lapses / Mortality / Sterling Reserves / Tax

§ Best Estimate Investment return is 6% (= risk free rate)

– 50% Equities, 50% Gilts; Equity Return 6%; Gilt Return 6%

§ Discount rate is 6% (= risk free rate)

§ 1.5% AMC, no other charges

§ Return of premium guarantee after 5 years

MCEV – Example

| Year | 1 | 2 | 3 | 4 | 5 |
|-----------------------------|-------|-------|-------|-------|-------------------------|
| Premium | 1,000 | 0 | 0 | 0 | 0 |
| Asset Share (Start of Year) | 1,000 | 1,044 | 1,090 | 1,138 | 1,188 |
| Gross Investment Return | 60 | 63 | 65 | 68 | 71 |
| AMC | 16 | 17 | 17 | 18 | 19 |
| Asset Share (End of Year) | 1,044 | 1,090 | 1,138 | 1,188 | 1,240 |
| Cost of Gtee | 0 | 0 | 0 | 0 | 0 |
| AMC | 16 | 17 | 17 | 18 | 19 |
| Expenses | 10 | 10 | 10 | 10 | 10 |
| PV Cost of Gtee | 0 | | | | |
| | | | | | NBAV (Point of Sale) 31 |
| PV AMC | 73 | | | | Value of Guarantees ? |
| PV Expenses | 42 | | | | MCNBAV ? |

MCEV – Example

Good Scenario (14% Investment Return)

| | | | |
|-----------------|----|----------------------|----|
| PV Cost of Gtee | 0 | NBAV (Point of Sale) | 49 |
| PV AMC | 91 | | |
| PV Expenses | 42 | | |

Bad Scenario (-2% Investment Return)

| | | | |
|-----------------|-----|----------------------|-------------|
| PV Cost of Gtee | 121 | NBAV (Point of Sale) | (105) |
| PV AMC | 58 | | |
| PV Expenses | 42 | Average NBAV | (28) |

| | |
|-------------------------------|-------------|
| NBAV (Point of Sale) | 31 |
| Impact of Guarantee | (59) |
| MCNBAV (Point of Sale) | (28) |

MCEV – Example (100% Equities)

| Year | 1 | 2 | 3 | 4 | 5 |
|-----------------------------|-------|-------|-------|-------|-------------------------|
| Premium | 1,000 | 0 | 0 | 0 | 0 |
| Asset Share (Start of Year) | 1,000 | 1,044 | 1,090 | 1,138 | 1,188 |
| Gross Investment Return | 60 | 63 | 65 | 68 | 71 |
| AMC | 16 | 17 | 17 | 18 | 19 |
| Asset Share (End of Year) | 1,044 | 1,090 | 1,138 | 1,188 | 1,240 |
| Cost of Gtee | 0 | 0 | 0 | 0 | 0 |
| AMC | 16 | 17 | 17 | 18 | 19 |
| Expenses | 10 | 10 | 10 | 10 | 10 |
| PV Cost of Gtee | 0 | | | | NBAV (Point of Sale) 31 |
| PV AMC | 73 | | | | Value of Guarantees ? |
| PV Expenses | 42 | | | | MCNBAV ? |

MCEV Example (100% Equities)

Good Scenario (18% Investment Return)

| | | | |
|-----------------|-----|----------------------|----|
| PV Cost of Gtee | 0 | NBAV (Point of Sale) | 60 |
| PV AMC | 102 | | |
| PV Expenses | 42 | | |

Bad Scenario (-6% Investment Return)

| | | | |
|-----------------|-----|----------------------|-------------|
| PV Cost of Gtee | 238 | NBAV (Point of Sale) | (229) |
| PV AMC | 51 | | |
| PV Expenses | 42 | Average NBAV | (85) |

| | |
|-------------------------------|-------------|
| NBAV (Point of Sale) | 31 |
| Impact of Guarantee | (116) |
| MCNBAV (Point of Sale) | (85) |

Comparison of Results

| | EV 50% Gilts 50% Equities | EV 0% Gilts 100% Equities | EEV 50% Gilts 50% Equities | EEV 0% Gilts 100% Equities | MCEV 50% Gilts 50% Equities | MCEV 0% Gilts 100% Equities |
|--|--|--|---|---|--|--|
| Embedded Value (Intrinsic Value) | 31 | 33 | 31 | 33 | 31 | 31 |
| Allowance for Value of Guarantees | 0 | 0 | (39) | (80) | (59) | (116) |
| Total Embedded Value | 31 | 33 | (8) | (47) | (28) | (85) |

MCEV - Earnings

§ Split insurance/investment

§ Insurance:

- Experience variances
- Operating assumption changes

§ Investment:

- Return on assets backing MCEV
- Return on assets backing realistic liabilities

Wider Product Comparisons

- § EV to European EV to MCEV – considerations for:
- § With profits
- § Annuities
- § Unit linked
- § Term assurance

Wider Product Comparisons

With profits

§ Cost of options and guarantees

§ Estate burn-through

Annuities

§ Matching

§ MCEV does not capitalise credit spread

Wider Product Comparisons

Unit linked

§ Asset mix affects comparison

§ MCEV discounts non market cash flows at risk free rate

Term assurance

§ Low market risk

§ Reinsurance

Practical Considerations

- § Development of existing models
- § Consistency of management actions with RBS
- § Allowance for encumbered ICA capital
- § Overloading of models
- § Agency costs
- § Analysis of change – additional item
- § Accuracy and time considerations

Uses of Enhanced EV

§ NBAV measurement (as % PV premiums)

§ Product Design

§ Performance Management

- Insurance Profits
- Investment Profits
- Other drivers of value

MCEV or EEV?

- § Currently large European companies – EEV
- § In the UK Market Consistent Embedded Value is more prevalent
- § Short term in the UK Both?
- § Longer term MCEV

Enhanced Embedded Values

Comments?
Questions?

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