




The Actuarial Profession
making financial sense of the future

32nd ANNUAL GIRO CONVENTION

The Imperial Hotel, Blackpool



The Actuarial Profession
making financial sense of the future


MARKET-CONSISTENT EMBEDDED VALUE FOR GENERAL INSURERS

John Charles, Julian Leigh

Valuing an Insurance Company

- Inclusion in accounts
- Mergers and Acquisitions

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The Actuarial Profession
making financial sense of the future

Components of Value

- Net asset value
- Profit from existing business
- Profit from new business

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The Essential Profitbook
Modeling Your Business for the Future

The Life Approach

- Existing business is in-force
- Will release profits over years
- New business is goodwill

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The Essential Profitbook
Modeling Your Business for the Future

Apply to General Insurance

- In-force runs off quickly
- Renewals part of value
- But renewals are new business

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The Essential Profitbook
Modeling Your Business for the Future

Traditional Approach

- Project all cash flows
- Choose appropriate risk discount rate
- Discount

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The Accreted Penetration
Model: The Difference of the Value

A Transaction

- AA-rated company borrows £100
 - Interest 5%; 5-year term
- Lends £100 to BB-rated company
 - Interest 7%; 5-year term
- Net cash flow:

Time	1	2	3	4	5
Money	2	2	2	2	2
- Present value > 0

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The Accreted Penetration
Model: The Difference of the Value

A Transaction

- Has this added any value?
- Should it have added any value?

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The Accreted Penetration
Model: The Difference of the Value

Market-Consistent Approach

- Identify each cash flow separately
- Value each at discount rate appropriate to it
- Adjustments:
 - Double taxation
 - Agency costs

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The Act of Parliament
making them a crime in the future

A Transaction - Revisited

- AA company borrows £100 and lends to BB
 - Interest 5% pay, 7% receive; 5-year term

- Net cash flow:

Time	1	2	3	4	5	RDR
Money in	7	7	7	7	107	7%
Money out	-5	-5	-5	-5	-105	5%

- Present value = 0
- Value will add over time if no default

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The Act of Parliament
making them a crime in the future

A Transaction - Revisited

- AA company borrows £100 and lends to BB
 - Interest 5% pay, 7% receive; 5-year term

- Net cash flow:

Time	1	2	3	4	5	RDR
Money	1.96	1.92	1.88	1.84	-8.7	5.4237%

- Present value = 0
- Value will add over time if no default

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The Act of Parliament
making them a crime in the future

Risk-discount Rates

- Cash flows valued in line with similar traded cash flows
- Assets in line with asset prices
- Liabilities in line with assets they resemble
- Introduce no arbitrage

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The Acton of Penetration
Modeling the Difference of the Value

How Much Difference Does it Make?

- None
- Provided old EV used the correct overall RDR

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The Acton of Penetration
Modeling the Difference of the Value

Example

▪ Balance sheet

Assets	2264	Unpaid claims	1414
		Net unearned	350
		Capital	500

- Assets all gilts
- Release cash in proportion to runoff
- Capital required 10% of technical reserves
- Capital released as becomes unnecessary

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The Acton of Penetration
Modeling the Difference of the Value

Traditional EV

	1	2	3	4	5	6	7
Opening res	1764	1102	594	265	96	30	6
Claims paid	662	508	330	169	66	24	6
Closing res	1102	594	265	96	30	6	0
Claims inc'd	0	0	0	0	0	0	0
Investment inc	91	48	26	12	4	1	0
Profit	91	48	26	12	4	1	0
Capital release 390	51	33	17	7	2	1	
Shareholders'	480	99	59	29	11	4	1
Cash flow							

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The Annualized Probabilities
Modeling the Financial Impact of the Event

Traditional EV

	1	2	3	4	5	6	7
Shareholders'	480	99	59	29	11	4	1
Cash flow							

Discounted present value at

- 4% 643
- 7% 616
- 10% 592

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The Annualized Probabilities
Modeling the Financial Impact of the Event

What are the Cash Flows?

	1	2	3	4	5	6	7
Claims	-662	-508	-330	-169	-66	-24	-6
Asset backing	721	552	359	184	72	26	6
Capital	422	54	30	14	5	2	0

Discounted present value at

- | | Claims | Assets | Capital |
|-------|--------|--------|---------|
| ▪ 2½% | -1672 | 1820 | 510 |
| ▪ 4% | -1621 | 1764 | 500 |
| ▪ 7% | -1527 | 1661 | 482 |
| ▪ 10% | -1442 | 1569 | 465 |

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The Annualized Probabilities
Modeling the Financial Impact of the Event

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▪ 4%	-1621	1764	500	643
▪ 7%	-1527	1661	482	
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The Annualized Probabilities
Modeling the Risk of Loss in the Future

What are the Cash Flows?

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The Annualized Probabilities
Modeling the Risk of Loss in the Future

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Cash flow							

Discounted present value at

▪ 4%	643						
▪ 7%	616						
▪ 10%	592						

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The Annualized Probabilities
Modeling the Risk of Loss in the Future

Other Adjustments to MCEV

Assets

- Limited-liability put option
- Tax shields

Liabilities

- Costs of double taxation
- Agency costs
- Costs of financial distress

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The Annual of Probabilities
Modeling the Real World of the Future

The cost of capital

- MC CoC seems to be 0
 - If we ignore tax
- Coc in traditional EV is a side-effect of setting discount rate too high (?)

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The Annual of Probabilities
Modeling the Real World of the Future

Meeting the real world: tax

	1	2	3	4	5	6	7
Opening res	1764	1102	594	265	96	30	6
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Claims inc'd	0	0	0	0	0	0	0
Investment inc	91	48	26	12	4	1	0
Profit	91	48	26	12	4	1	0
Tax paid	27	15	8	3	1	0	0
Capital release	390	51	33	17	7	2	1
Shareholders'	453	85	51	25	10	3	1
Cash flow							

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The Annual of Probabilities
Modeling the Real World of the Future

Traditional EV with tax

	1	2	3	4	5	6	7
Shareholders'	453	85	51	25	10	3	1
Cash flow							

Discounted present value at

- 4% 592
- 7% 568
- 10% 546

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The Annual Financial Review
Holding Year 2018/2019

What are the Cash Flows?

	1	2	3	4	5	6	7
Claims	-662	-508	-330	-169	-66	-24	-6
Asset backing	699	539	352	181	71	26	6
Capital	416	53	29	13	5	2	0

Discounted present value at

	Claims	Assets	Capital
▪ 2½%	-1672	1776	502
▪ 4%	-1621	1721	492
▪ 7%	-1527	1621	474
▪ 10%	-1442	1531	457

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The Annual Financial Review
Holding Year 2018/2019

What are the Cash Flows?

	1	2	3	4	5	6	7
Claims	-662	-508	-330	-169	-66	-24	-6
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▪ 10%	-1442	1531	457	

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The Annual Financial Review
Holding Year 2018/2019

Economic Balance Sheet

Assets

▪ MV of assets 2264

Liabilities

▪ Unpaid claims 1621
▪ CoDT 51
▪ Economic value 592

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The Annual of Penetration
Modeling the Difference of the Value

Agency Costs

- Cost of employing others to run company
- Any allowance is subjective
- Area for research

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The Annual of Penetration
Modeling the Difference of the Value

Economic Balance Sheet

Assets

▪ MV of assets 2264

Liabilities

▪ Unpaid claims 1621
▪ CoDT 51
▪ Agency costs 46
▪ Economic value 546

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The Annual of Penetration
Modeling the Difference of the Value

Future New Business

- To include or not to include?
- To include for how long?
- Same issues as traditional appraisal value

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The Accreted Partnership
Modeling the Value of the Future

Goodwill

- Beyond included new business
- "Franchise value" in MCEV
- Not part of embedded value

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The Accreted Partnership
Modeling the Value of the Future
