Institute of Actuaries of India
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Articulating and quantifying the “fair treatment of participating policyholders”

Speaker(s)
Ashik Salecha FIAI
Shubham Jain

Session #C4
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Agenda

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Bonus investigation: a new dimension

Effective IRRs

Mortality adjusted IRRs

Reduction in yield (RIY)

Top-down approach: policyholder's perspective

Parity

Bottom-up approach : insurer's perspective

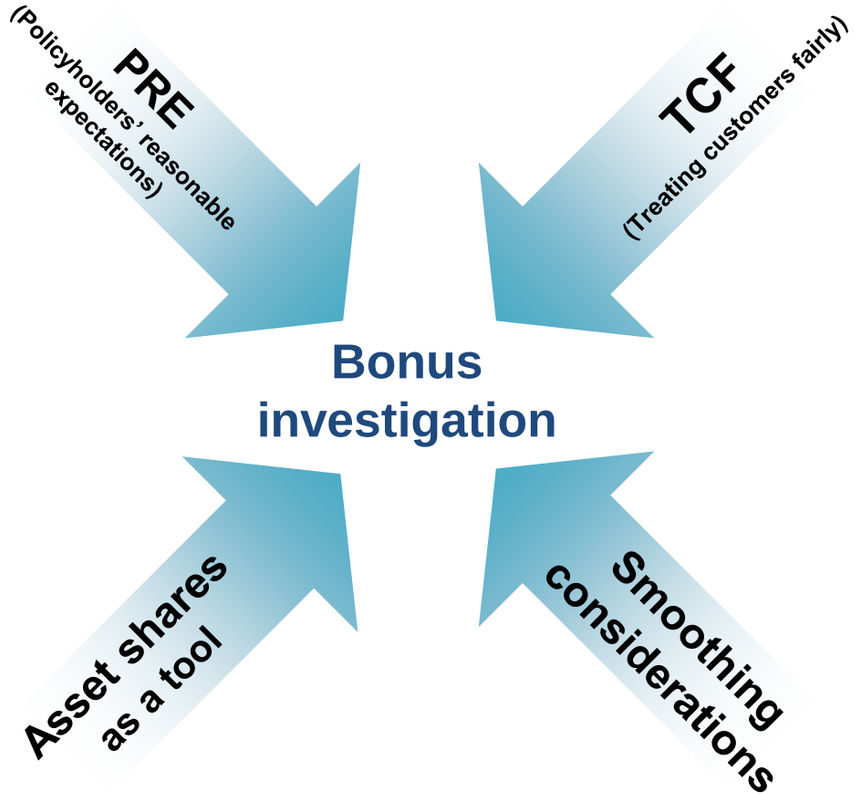
Smoothing

Asset share

Illustrated Maturity Values (IMVs)

IRR on maturity

Bonus investigation: a new dimension



Par fund management

Other considerations:

- Comparisons against Illustrated Maturity Values (IMVs)
- Any other internal metric or regulatory requirements

Some interesting anomalies..

Single premium = 100
Policy term = 5 years
AS at maturity = 150

95%*AS =143 | Target Payout | 110%*AS =165

7.4% IRR 10.5%

Over-reliance on range-bound asset share pay-outs

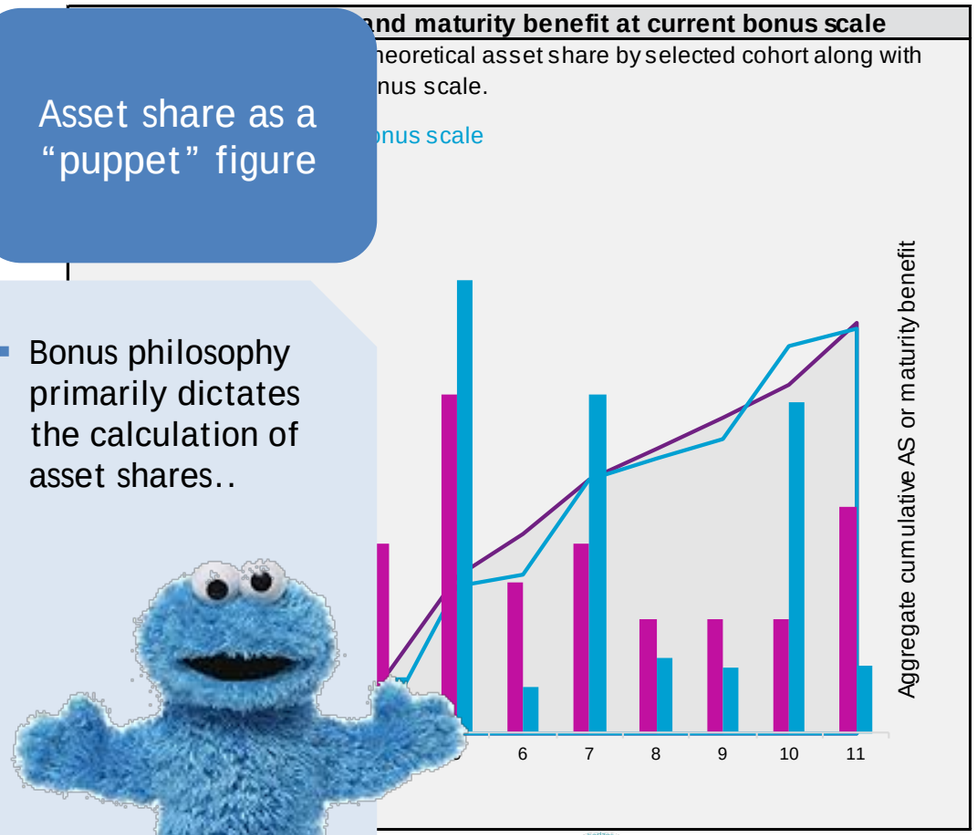
- …leads to loss of critical information
- Setting out a target pay-out range on asset shares can give wider variance in policyholder outcomes

Data mining and use of analytics to derive insights

- Use of algorithm against manual analysis of results to derive meaningful insights
- Ensuring “majority” policyholders get a target asset share can cause disparities
- Use of data analytics to create meaningful cohorts

Asset share as a “puppet” figure

- Bonus philosophy primarily dictates the calculation of asset shares..



Articulating and quantifying the PRE and TCF

Use of mortality cost adjusted-IRR for pol

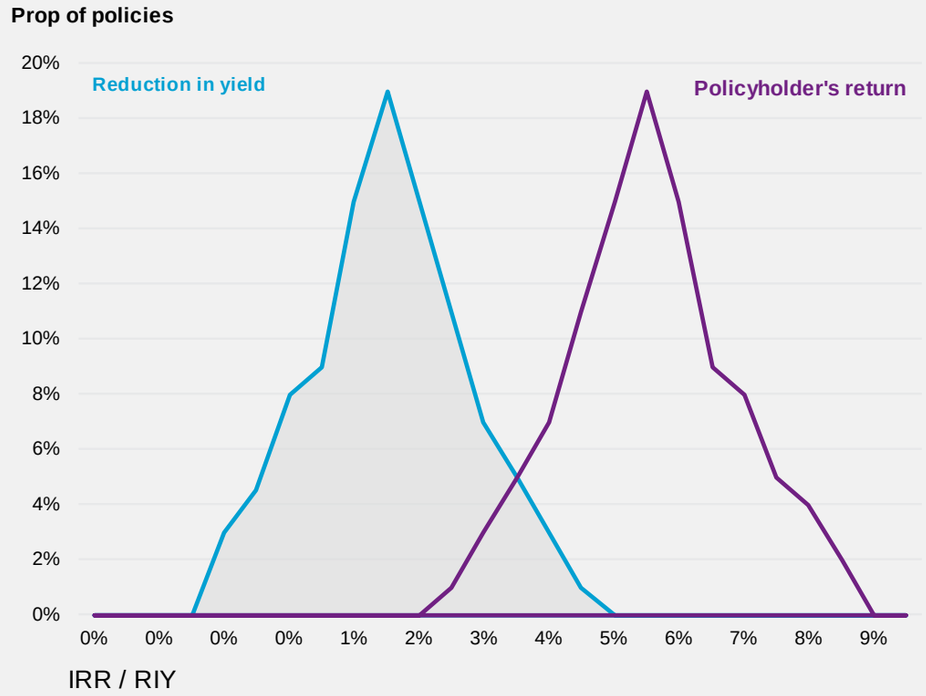
- Mortality adjusted IRR = {Investment benefits
- Plot these IRRs to analyse the spread for polic
- Compare against the CAGR of return earned b

Use of target Reduction in yield (RIY):

- Determine a target reduction-in yield (RIY) wh
- **Target return to policyholders = Total**
- Goal-seek this target return to determine the

Policyholder return and reduction in yield

The following graph shows distribution of policyholder's return (mortality cost adjusted IRR) and implicit reduction against the gross investment return earned.



Articulating and quantifying the PRE and TCF

Possible quantification of PR

- **Illustrated payout** (or that bas aken as a possible quantification of the PRE.
- Compare PRE benefit vs projec

Possible quantification of TC

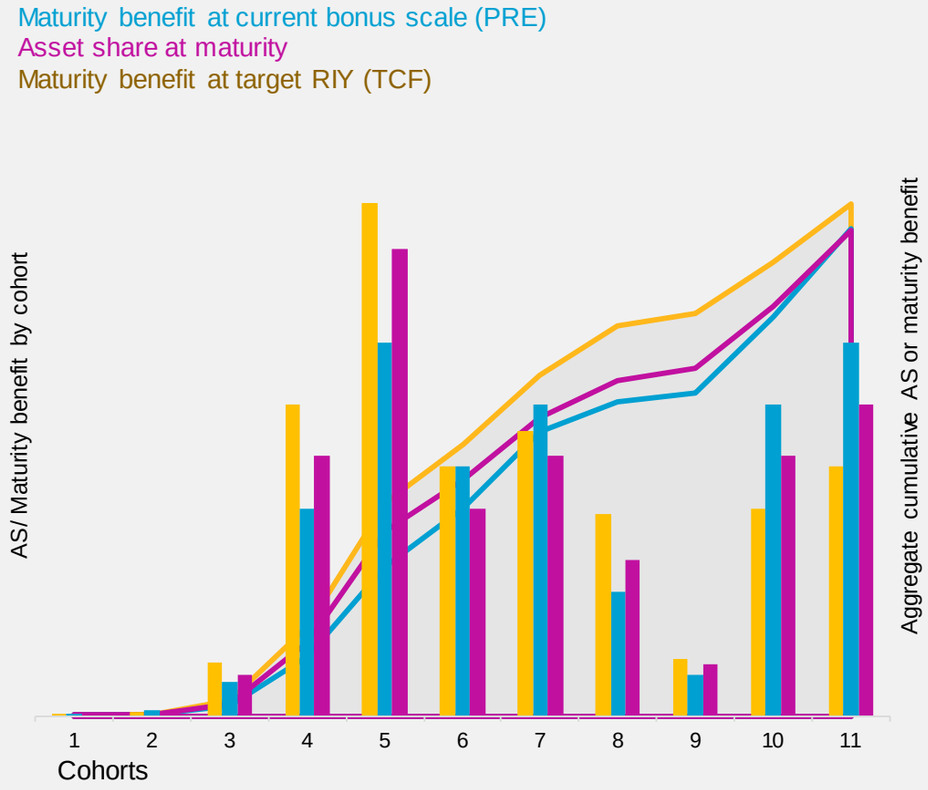
- Calculate a **payout goal-seeki a target RIY**). This pay-out can represent a possible quantifica
- Compare TCF pay-out against

Other considerations in dete

- **Consider the max of {PRE be**
- May need to consider a target es.
- Practical constraints to manag m etc.

Maturity pay-out analysis

The following graph shows comparison of PRE benefit vs TCF pay-out vs projected asset share at maturity.



Illustrative Dashboard

Model Point number	Table number	inception year	maturity year	policy term	annuity term (T45 only)	age at inception	premium	sum assured	frequency (premium mode)	SA / (Prem * Term)	duration in-force	time to maturity	MP asset share at valuation date	MP asset share at maturity	bonus accrued till maturity	projected pay-out at maturity	mortality-adjusted IRR to p/h	gross CAGR earned by Company	reduction in yield	number of policies represented	sum assured represented	premium represented
													current	current		current	current		current			
1	5	1978	2018	40	0	25	357	15,000	1	105%	39.6	0.4	-85,064	-179,371	73,440	88,440	8.5%	13.1%	4.6%	1	15,000	357
2	5	1980	2020	40	0	25	1,282	50,000	1	98%	37.6	2.4	572,094	419,513	257,300	307,300	8.4%	13.0%	4.6%	1	50,000	1,282
3	5	1982	2022	40	0	25	257	10,000	1	97%	35.6	4.4	-119,214	-285,925	53,830	63,830	8.5%	12.8%	4.3%	1	10,000	257
4	5	1984	2019	35	0	25	682	25,000	1	105%	33.6	1.4	68,179	-60,050	109,150	134,150	9.1%	12.9%	3.8%	1	25,000	682
5	5	1987	2022	35	0	25	842	30,000	1	102%	30.6	4.4	57,934	-95,855	138,060	168,060	9.1%	12.6%	3.5%	1	30,000	842
6	5	1987	2032	45	0	25	691	30,000	1	96%	30.6	14.4	17,181	-390,153	210,060	240,060	8.7%	12.3%	3.7%	*	30,000	691
7	5	1987	2022	35	0	25	1,265	45,000	1	102%	30.6	4.4	169,350	661	207,090	252,090	9.1%	12.6%	3.5%		45,000	1,265
8	5	1988	2042	54	0	25	501	25,000	1	93%	29.6	24.4	-39,714	-2,437,724	230,900	255,900	8.7%	11.9%	*		50,000	1,001
9	5	1988	2018	30	0	25	1,262	40,000	1	106%	29.6	0.4	136,109	-38,187	139,040	179,040	9.6%	12.8%			80,000	2,524
10	5	1988	2023	35	0	25	1,033	40,000	1	111%	29.6	5.4	81,335	-110,298	187,040	227,040	9.6%				80,000	2,066
11	5	1988	2018	30	0	25	2,021	70,000	1	115%	29.6	0.4	304,990	3,843	243,320	313,320	-				70,000	2,021
12	5	1988	2018	30	0	35	1,602	50,000	1	104%	29.6	0.4	198,095	-18,312	173,800	223,[illegible]					50,000	1,602
13	5	1989	2019	30	0	25	2,230	80,000	1	120%	28.6	1.4	294,756	-25,326	282,320					1	80,000	2,230
14	5	1989	2024	35	0	35	2,398	75,000	1	89%	28.6	6.4	321,981	183,898	35[illegible]					1	75,000	2,398
15	5	1991	2021	30	0	25	2,096	75,000	1	119%	26.6	3.4	186,564	-80,[illegible]					2.1%	1	75,000	2,096
16	5	1992	2022	30	0	25	1,564	60,000	1	128%	25.6	4.4	82,923					12.3%	1.5%	1	60,000	1,564
17	5	1992	2022	30	0	25	1,928	74,000	1	128%	25.6	4.4	-					12.3%	1.5%	1	74,000	1,928
18	5	1993	2018	25	0	25	2,564	80,000	1	125%	24.6	0.4					11.0%	12.4%	1.4%	1	80,000	2,564
19	5	1993	2023	30	0	25	2,226	82,000	1	123%	24.6	5.4				278,840	10.5%	12.2%	1.7%	1	82,000	2,226
20	5	1994	2019	25	0	25	1,994	53,333	1	107%						189,600	10.0%	12.2%	2.2%	3	160,000	5,982
21	5	1994	2019	25	0	25	2,559	70,000	1	10[illegible]					178,850	248,850	10.2%	12.2%	2.0%	1	70,000	2,559
22	5	1994	2024	30	0	25	2,064	75,000	1					-80,388	272,250	347,250	10.5%	12.1%	1.6%	1	75,000	2,064
23	5	1994	2019	25	0	35	2,075	50,00[illegible]					-96	-66,434	127,750	177,750	9.7%	12.2%	2.5%	1	50,000	2,075
24	5	1994	2019	25	0	35	2,889						178,233	-63,936	191,625	266,625	10.3%	12.2%	1.9%	1	75,000	2,889
25	5	1995	2020	25	0	25						2.4	-12,648	-111,833	63,300	88,300	9.7%	12.0%	2.3%	1	25,000	974
26	5	1995	2020	25	0	25						2.4	61,153	-104,584	126,600	176,600	10.2%	12.0%	1.8%	2	100,000	3,626
27	5	1995	2025	30	0						22.6	7.4	42,254	-175,056	180,350	230,350	9.6%	11.9%	2.3%	2	100,000	3,189
28	5	1995	2020	25						102%	22.6	2.4	164,160	-58,929	189,900	264,900	9.6%	12.0%	2.4%	1	75,000	2,951
29	5	1995	2020	25					1	89%	22.6	2.4	348	-117,621	75,960	105,960	10.4%	12.0%	1.6%	1	30,000	1,349
30	5	1995	2020					[illegible]	1	85%	22.6	2.4	89,393	-70,327	126,600	176,600	10.0%	12.0%	2.0%	1	50,000	2,365
31	5	1996	2[illegible]				[illegible]	25,000	1	105%	21.6	3.4	-19,335	-126,717	62,625	87,625	9.8%	11.9%	2.1%	1	25,000	953
32	5	1996	20[illegible]				767	25,000	1	109%	21.6	8.4	-34,213	-252,270	89,500	114,500	9.8%	11.8%	2.0%	1	25,000	767
33	5	1996	202			[illegible]	2,103	50,000	1	95%	21.6	3.4	72,286	-80,648	125,250	175,250	9.1%	11.9%	2.7%	3	150,000	6,309
34	5	1996	2016			35	1,083	25,000	1	105%	21.6	0.4	-12,846	-87,729	48,000	73,000	10.1%	12.0%	1.9%	1	25,000	1,083
35	5	1996	2021		0	35	1,972	50,000	1	101%	21.6	3.4	55,564	-107,197	125,250	175,250	10.0%	11.9%	1.9%	2	100,000	3,943
36	5	1996	2021	25	0	35	3,087	80,000	1	104%	21.6	3.4	141,057	-87,917	200,400	280,400	10.1%	11.9%	1.7%	1	80,000	3,087
37	5	1997	2018	21	0	25	1,162	25,000	1	102%	20.6	0.4	-8,410	-77,904	42,975	67,975	9.4%	11.9%	2.4%	1	25,000	1,162
38	5	1997	2027	30	0	25	830	25,000	1	100%	20.6	9.4	-31,529	-265,129	89,350	114,350	9.4%	11.7%	2.3%	1	25,000	830
39	5	1997	2027	30	0	25	1,550	55,000	1	118%	20.6	9.4	16,602	-267,550	196,570	251,570	10.3%	11.7%	1.4%	2	110,000	3,099
40	5	1997	2018	21	0	35	1,083	25,000	1	110%	20.6	0.4	-17,635	-87,676	42,975	67,975	10.4%	11.9%	1.5%	2	25,000	2,166
41	5	1997	2022	25	0	35	1,967	50,000	1	102%	20.6	4.4	42,480	-123,523	124,950	174,950	10.0%	11.7%	1.8%	1	50,000	1,967
42	5	1997	2018	21	0	35	3,294	75,000	1	108%	20.6	0.4	133,080	-66,309	128,925	203,925	10.2%	11.9%	1.6%	1	75,000	3,294
43	5	1998	2018	20	0	25	14,627	20,000	5	7%	19.6	0.4	10,347	-40,785	30,460	50,460	6.8%	11.8%	5.0%	1	20,000	14,627
44	5	1998	2018	20	0	25	1,277	25,000	1	98%	19.6	0.4	-6,072	-70,553	38,075	63,075	8.9%	11.8%	2.9%	2	50,000	2,554
45	5	1998	2023	25	0	25	941	25,000	1	106%	19.6	5.4	-27,226	-158,213	62,450	87,450	9.9%	11.7%	1.8%	1	25,000	941
46	5	1998	2018	20	0	25	2,600	53,125	1	102%	19.6	0.4	74,464	-57,463	80,909	134,034	9.2%	11.8%	2.5%	8	425,000	20,799

Backing data dump for the calculation engine

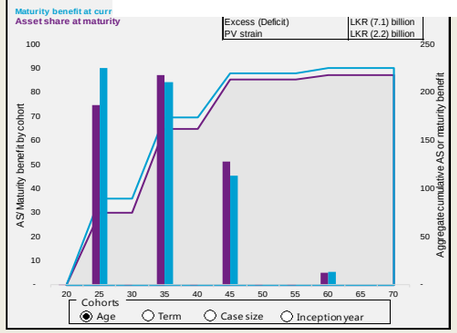
Willis Towers Watson

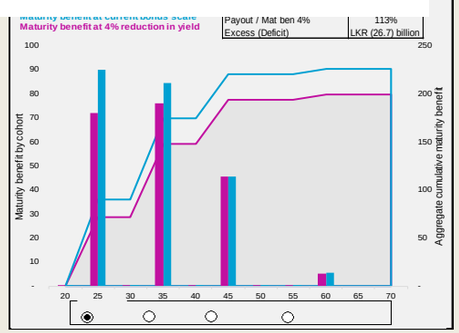
Select product: 5

Quick view of various insights through a dash-board

1: Asset share at

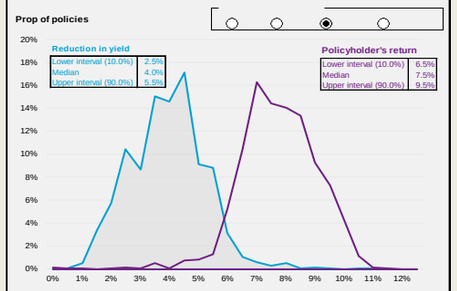
The following graph
inception year along





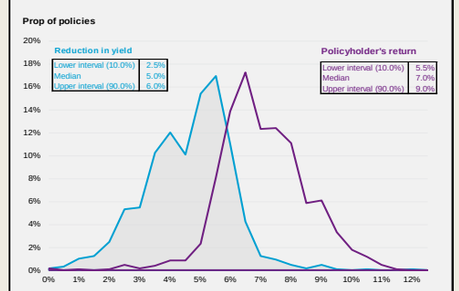
3: Policyholder return and reduction in yield

The following graph shows distribution of policyholder's return (mortality cost adjusted IRR) and implicit reduction against the gross investment return.



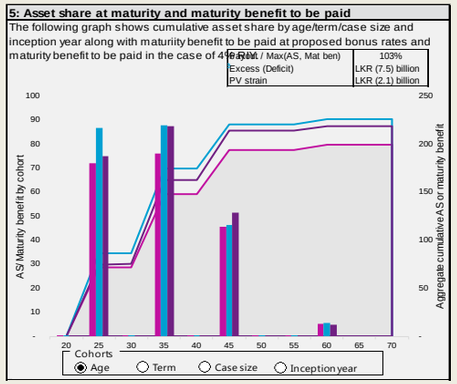
4: Policyholder return and reduction in yield

The following graph shows distribution of policyholder's return (mortality cost adjusted IRR) and the implicit reduction in yield based on the proposed scale.



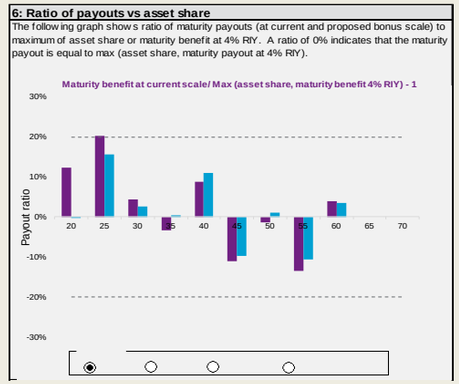
5: Asset share at maturity and maturity benefit to be paid

The following graph shows cumulative asset share by age/term/case size and inception year along with maturiity benefit to be paid at proposed bonus rates and maturity benefit to be paid in the case of 4% RIY.



6: Ratio of payouts vs asset share

The following graph shows ratio of maturity payouts (at current and proposed bonus scale) to maximum of asset share or maturity benefit at 4% RIY. A ratio of 0% indicates that the maturity payout is equal to max (asset share, maturity payout at 4% RIY).



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Questions & Answers

Any questions ?

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THANK YOU