At Retirement - Retirement Income Product Choice

Living Annuities and/or Guaranteed Life Annuities

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Living Annuities:
The obvious benefits and one major downside risk

- Potential for capital growth over and above the withdrawal rate (annuities), i.e. growth of retirement capital exceeds the withdrawal rate
- “Preservation” of retirement capital for the benefits of children, grandchildren or other beneficiaries – “legacy capital”
- Full flexibility regarding withdrawal rate and composition of investment portfolio; i.e. “in control” of your investment plan

- BUT, Longevity risk – how long will my capital last? Will I outlive my capital? What happens to my plan if market returns are depressed for a protracted period of time or live longer than reasonably expected?

Guaranteed Life Annuities (GLA):

- Guaranteed income for life (typically by a life insurance company), thus it mitigates longevity risk, investment (market) risk.

- Capital allocated to an GLA is irreversible, thus exchanging capital for surety of income, based on prevailing long-term interest rates and it cannot be undone at some point in the future.

- BUT the downside of no “legacy capital” (no benefits payable to potential beneficiaries), no flexibility in managing your retirement plan, and no fine-tuning to your specific needs, etc.

Is there an “optimal solution” between the choice of living annuities and guaranteed life annuities?

- Testing different combinations of allocations to living annuities (LA) and guaranteed life annuities (GLA).

- For example,
  - Situation 1 = 100% living annuities
  - Situation 2 = 75% living annuities, 25% guaranteed life annuities
  - Situation 3 = 50% living annuities, 50% guaranteed life annuities
  - Situation 4 = 25% living annuities, 75% guaranteed life annuities

Assumptions of the analysis

- Guaranteed life annuity rate = **initially 4.5%** p.a., based on a *joint life* contract (based on both spouse's lives, and payable until the death of the last surviving spouse), **escalating by 5%** (or inflation) per annum.
- *Initial withdrawal rate* from living annuity = **3.5%** or **5%** or **6.5%** of retirement capital.
- Income need of living annuity's annuitant escalates each year with inflation rate.
- Living annuity investment portfolio = 50% equities & properties, 30% bonds, 20% cash
- Long-term **real** returns = equities & properties 5%, bonds 2% and cash 1% p.a.
- Expected portfolio return = 3.3% p.a.
- Expected volatility/standard deviation of portfolio = 15% p.a.
- Projected post-retirement period = up to 40 years.
- Surplus income (investment income from portfolio exceeds required income) are re-invested in the plan, and thus not consumed.
- 2,500 repetitions simulated.

The measures of success of one's retirement plan - Two possible objectives:

- Meeting the **income need target** (100% or 75% or 50% of each year's income target)

- **Legacy capital** available after 10, 15, 20, 25, 30, 35 and 40 years of retirement

The ideal retirement plan should be able to yield sufficient and growing income during one's retirement and some capital on death of last surviving spouse should be available to be passed on to next generations.

Testing the outcome of different combinations of living annuity (LA) and guaranteed life annuity (GLA)

- Meeting the income need target (100% , 75% or 50%)
  - After *x* post-retirement years, how much of the income target is provided by the plan?

- Legacy capital available after 10, 15, 20, 25, 30, 35 and 40 years of retirement
  - How much retirement capital will be available after *x* number of years?
  - Expressed as percentage of original retirement capital

- Test each combination of LA and GLA against three potential income needs (withdrawal rates): **3.5%** or **5%** or **6.5%** of original retirement capital
  - Situation 1 = 100% living annuities
  - Situation 2 = 75% living annuities, 25% guaranteed life annuities
  - Situation 3 = 50% living annuities, 50% guaranteed life annuities
  - Situation 4 = 25% living annuities, 75% guaranteed life annuities

Situation 1: 100% Living Annuities (initial income need = 3.5% of capital)

3.5% WD	Annuity income			Legacy capital						
Percentile	100% of target	75% of target	50% of target	10 y	15 y	20 y	25 y	30 y	35 y	40 y
10%	16	17	19	37%	20%	8%	3%	1%	1%	0%
25%	22	23	26	57%	40%	24%	11%	4%	2%	1%
40%	29	31	33	73%	60%	45%	31%	16%	7%	3%
50%	35	37	40	84%	75%	62%	49%	35%	20%	9%
60%	40	40	40	97%	91%	81%	71%	61%	47%	31%
75%	40	40	40	121%	125%	125%	120%	117%	108%	103%
90%	40	40	40	165%	190%	215%	233%	259%	272%	300%

- Based on 2,500 simulations, midpoint outcome = 50% percentile
- The plan will meet 100% of projected income need up to **35** years of post-retirement period
- Legacy capital = **62%** of original capital after 20 years

Situation 1: 100% Living Annuities (initial income need = 5% of capital)

5% WD	Annuity income			Legacy capital						
Percentile	100% of target	75% of target	50% of target	10 y	15 y	20 y	25 y	30 y	35 y	40 y
10%	10	11	14	25%	10%	4%	2%	1%	0%	0%
25%	13	15	17	41%	19%	8%	4%	1%	1%	0%
40%	17	18	21	56%	34%	15%	7%	3%	1%	1%
50%	20	21	24	67%	46%	24%	10%	5%	2%	1%
60%	23	25	27	79%	61%	40%	19%	9%	4%	2%
75%	31	33	36	102%	92%	74%	55%	33%	15%	6%
90%	40	40	40	143%	146%	144%	139%	132%	121%	105%

- Based on 2,500 simulations, midpoint outcome = 50% percentile
- The plan will meet 100% of projected income need up to **20** years of post-retirement period
- Legacy capital = **24%** of original capital after 20 years

Situation 1: 100% Living Annuities (initial income need = 6.5% of capital)

6.5% WD	Annuity income			Legacy capital						
Percentile	100% of target	75% of target	50% of target	10 y	15 y	20 y	25 y	30 y	35 y	40 y
10%	7	8	10	18%	7%	3%	1%	0%	0%	0%
25%	9	11	13	28%	12%	5%	2%	1%	0%	0%
40%	11	13	15	42%	19%	8%	3%	1%	1%	0%
50%	13	15	17	51%	24%	11%	5%	2%	1%	0%
60%	15	17	19	62%	33%	15%	6%	3%	1%	1%
75%	19	21	23	83%	57%	29%	13%	6%	3%	1%
90%	33	34	37	124%	110%	93%	73%	48%	23%	10%

- Based on 2,500 simulations, midpoint outcome = 50% percentile
- The plan will meet 100% of projected income need up to **13** years of post-retirement period
- Legacy capital = **11%** of original capital after 20 years

Situation 2: 75% LA, 25% GLA (initial income need = 3.5% of capital)

3.5% WD	Annuity income			Legacy capital						
Percentile	100% of target	75% of target	50% of target	10 y	15 y	20 y	25 y	30 y	35 y	40 y
10%	18	20	25	31%	19%	8%	3%	1%	1%	0%
25%	26	28	33	46%	35%	24%	14%	6%	3%	1%
40%	35	38	40	58%	51%	42%	33%	24%	13%	5%
50%	40	40	40	67%	62%	57%	48%	39%	31%	21%
60%	40	40	40	77%	76%	72%	68%	61%	54%	45%
75%	40	40	40	97%	102%	107%	109%	113%	111%	114%
90%	40	40	40	131%	151%	172%	196%	203%	228%	249%

- Based on 2,500 simulations, midpoint outcome = 50% percentile
- The plan will meet 100% of projected income need up to **40** years of post-retirement period
- Legacy capital = **57%** of original capital after 20 years

Situation 2: 75% LA, 25% GLA (initial income need = 5% of capital)

5% WD	Annuity income			Legacy capital						
Percentile	100% of target	75% of target	50% of target	10 y	15 y	20 y	25 y	30 y	35 y	40 y
10%	10	12	15	19%	7%	3%	1%	0%	0%	0%
25%	13	15	19	31%	14%	6%	3%	1%	0%	0%
40%	16	19	22	42%	25%	11%	5%	2%	1%	0%
50%	19	21	25	50%	33%	17%	7%	3%	1%	1%
60%	22	25	28	60%	44%	29%	13%	6%	3%	1%
75%	30	33	37	76%	67%	55%	38%	21%	10%	4%
90%	40	40	40	106%	105%	105%	104%	94%	92%	78%

- Based on 2,500 simulations, midpoint outcome = 50% percentile
- The plan will meet 100% of projected income need up to **19** years of post-retirement period
- Legacy capital = **17%** of original capital after 20 years

Situation 2: 75% LA, 25% GLA (initial income need = 6.5% of capital)

6.5% WD	Annuity income			Legacy capital						
Percentile	100% of target	75% of target	50% of target	10 y	15 y	20 y	25 y	30 y	35 y	40 y
10%	6	8	11	12%	5%	2%	1%	0%	0%	0%
25%	8	10	13	19%	8%	3%	1%	1%	0%	0%
40%	10	12	15	27%	11%	5%	2%	1%	0%	0%
50%	11	13	16	33%	14%	6%	3%	1%	0%	0%
60%	12	15	18	40%	19%	8%	4%	2%	1%	0%
75%	16	18	21	55%	34%	14%	6%	3%	1%	1%
90%	24	26	30	84%	68%	46%	24%	11%	5%	2%

- Based on 2,500 simulations, midpoint outcome = 50% percentile
- The plan will meet 100% of projected income need up to **11** years of post-retirement period
- Legacy capital = **6%** of original capital after 20 years

Situation 3: 50% LA, 50% GLA (initial income need = 3.5% of capital)

3.5% WD	Annuity income			Legacy capital						
Percentile	100% of target	75% of target	50% of target	10 y	15 y	20 y	25 y	30 y	35 y	40 y
10%	23	30	40	23%	16%	11%	5%	2%	1%	0%
25%	35	40	40	33%	27%	23%	18%	12%	7%	3%
40%	40	40	40	42%	38%	34%	31%	27%	23%	18%
50%	40	40	40	48%	45%	44%	42%	38%	36%	33%
60%	40	40	40	55%	54%	55%	54%	54%	54%	52%
75%	40	40	40	67%	70%	77%	82%	86%	92%	97%
90%	40	40	40	91%	105%	119%	137%	154%	181%	205%

- Based on 2,500 simulations, midpoint outcome = 50% percentile
- The plan will meet 100% of projected income need up to **40** years of post-retirement period
- Legacy capital = **44%** of original capital after 20 years

Situation 3: 50% LA, 50% GLA (initial income need = 5% of capital)

5% WD	Annuity income			Legacy capital						
Percentile	100% of target	75% of target	50% of target	10 y	15 y	20 y	25 y	30 y	35 y	40 y
10%	8	12	22	11%	4%	2%	1%	0%	0%	0%
25%	12	15	26	19%	8%	3%	1%	1%	0%	0%
40%	15	18	29	26%	14%	6%	3%	1%	0%	0%
50%	17	21	32	31%	20%	9%	4%	2%	1%	0%
60%	20	24	35	37%	27%	15%	6%	3%	1%	1%
75%	27	30	40	48%	40%	30%	19%	8%	4%	1%
90%	40	40	40	67%	67%	65%	58%	51%	42%	34%

- Based on 2,500 simulations, midpoint outcome = 50% percentile
- The plan will meet 100% of projected income need up to **17** years of post-retirement period
- Legacy capital = **9%** of original capital after 20 years

Situation 3: 50% LA, 50% GLA (initial income need = 6.5% of capital)

6.5% WD	Annuity income			Legacy capital						
Percentile	100% of target	75% of target	50% of target	10 y	15 y	20 y	25 y	30 y	35 y	40 y
10%	4	7	12	7%	3%	1%	0%	0%	0%	0%
25%	6	8	14	10%	4%	2%	1%	0%	0%	0%
40%	7	10	16	13%	6%	2%	1%	0%	0%	0%
50%	8	11	17	16%	7%	3%	1%	1%	0%	0%
60%	9	12	18	20%	9%	4%	2%	1%	0%	0%
75%	12	15	21	28%	13%	6%	3%	1%	1%	0%
90%	17	20	26	45%	30%	15%	6%	3%	1%	1%

- Based on 2,500 simulations, midpoint outcome = 50% percentile
- The plan will meet 100% of projected income need up to **8** years of post-retirement period
- Legacy capital = **3%** of original capital after 20 years

Situation 4: 25% LA, 75% GLA (initial income need = 3.5% of capital)

3.5% WD	Annuity income			Legacy capital						
Percentile	100% of target	75% of target	50% of target	10 y	15 y	20 y	25 y	30 y	35 y	40 y
10%	40	40	40	15%	14%	13%	13%	13%	13%	12%
25%	40	40	40	20%	21%	21%	22%	22%	23%	25%
40%	40	40	40	25%	27%	28%	31%	33%	36%	38%
50%	40	40	40	29%	31%	34%	36%	41%	45%	48%
60%	40	40	40	33%	36%	40%	45%	49%	56%	61%
75%	40	40	40	39%	46%	52%	62%	71%	80%	91%
90%	40	40	40	51%	65%	79%	97%	114%	132%	158%

- Based on 2,500 simulations, midpoint outcome = 50% percentile
- The plan will meet 100% of projected income need up to **40** years of post-retirement period
- Legacy capital = **34%** of original capital after 20 years

Situation 4: 25% LA, 75% GLA (initial income need = 5% of capital)

5% WD	Annuity income			Legacy capital						
Percentile	100% of target	75% of target	50% of target	10 y	15 y	20 y	25 y	30 y	35 y	40 y
10%	7	14	40	5%	2%	1%	0%	0%	0%	0%
25%	9	17	40	7%	3%	1%	1%	0%	0%	0%
40%	11	20	40	10%	4%	2%	1%	0%	0%	0%
50%	13	22	40	13%	6%	3%	1%	1%	0%	0%
60%	15	24	40	16%	8%	4%	2%	1%	0%	0%
75%	20	29	40	21%	15%	8%	4%	2%	1%	0%
90%	32	40	40	31%	28%	24%	18%	11%	5%	2%

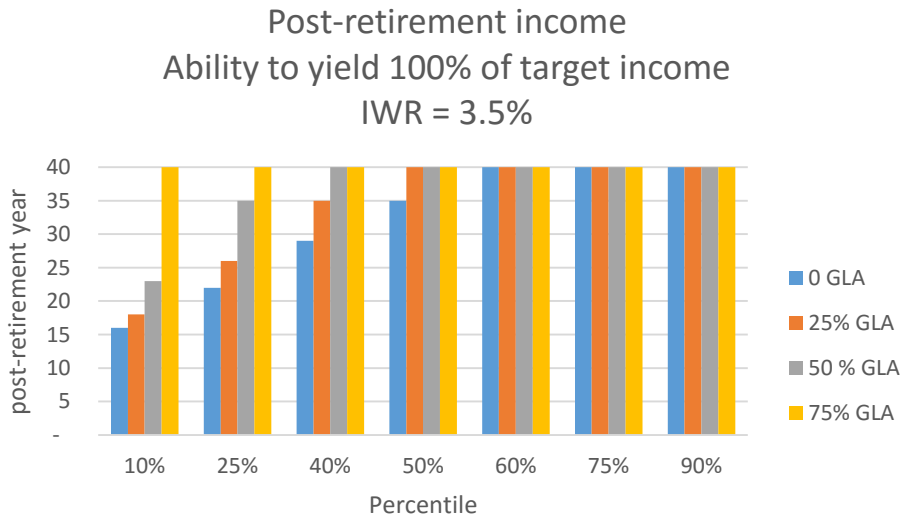
- Based on 2,500 simulations, midpoint outcome = 50% percentile
- The plan will meet 100% of projected income need up to **13** years of post-retirement period
- Legacy capital = **3%** of original capital after 20 years

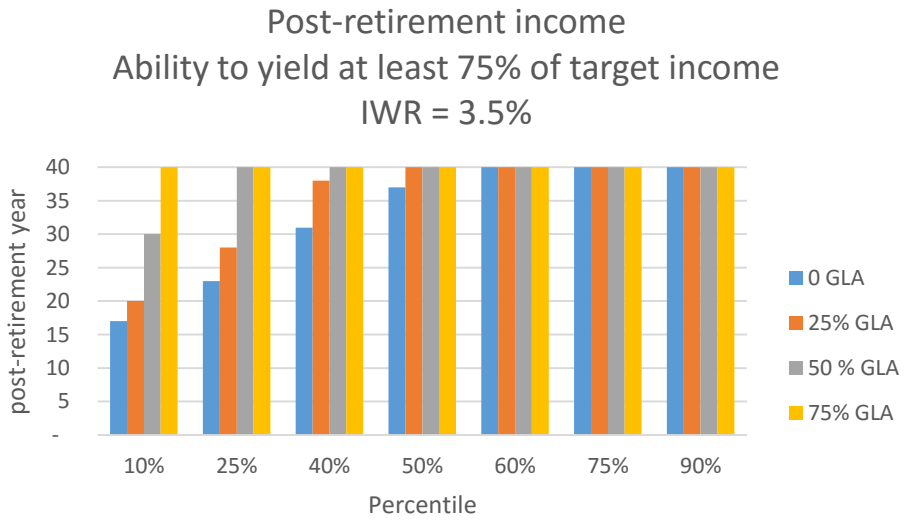
Situation 4: 25% LA, 75% GLA (initial income need = 6.5% of capital)

6.5% WD	Annuity income			Legacy capital						
Percentile	100% of target	75% of target	50% of target	10 y	15 y	20 y	25 y	30 y	35 y	40 y
10%	2	5	40	3%	1%	0%	0%	0%	0%	0%
25%	2	6	40	4%	1%	1%	0%	0%	0%	0%
40%	3	7	40	5%	2%	1%	0%	0%	0%	0%
50%	3	8	40	5%	2%	1%	0%	0%	0%	0%
60%	4	8	40	6%	3%	1%	1%	0%	0%	0%
75%	5	10	40	7%	3%	2%	1%	0%	0%	0%
90%	7	12	40	11%	5%	2%	1%	1%	0%	0%

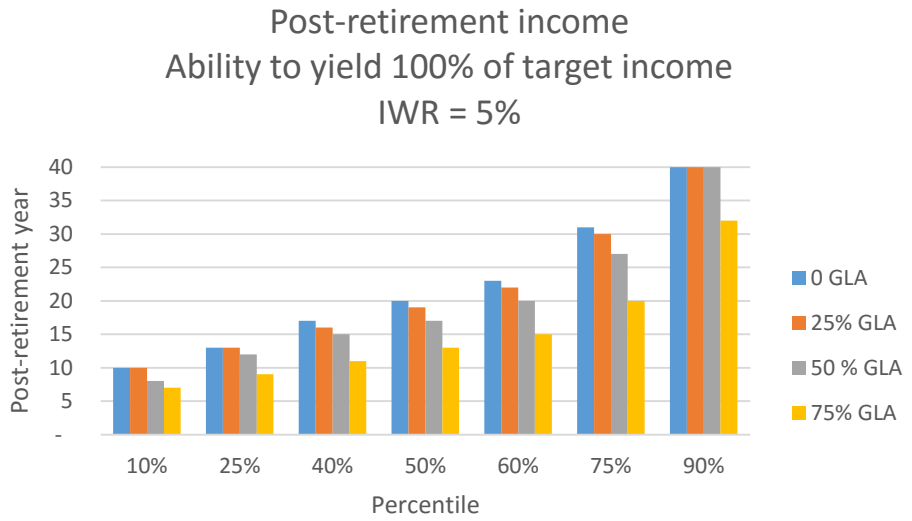
- Based on 2,500 simulations, midpoint outcome = 50% percentile
- The plan will meet 100% of projected income need up to **3** years of post-retirement period
- Legacy capital = **1%** of original capital after 20 years

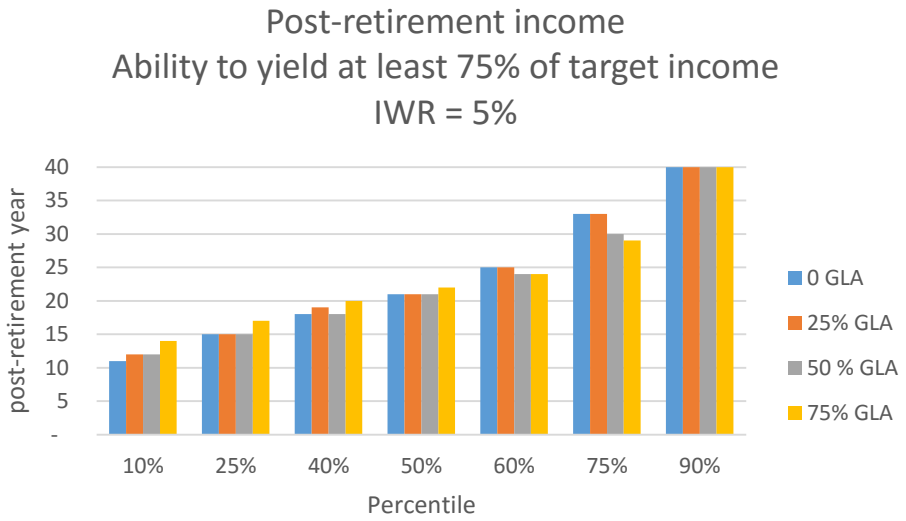
Summary: Target income objective
Initial withdrawal rate = 3.5%



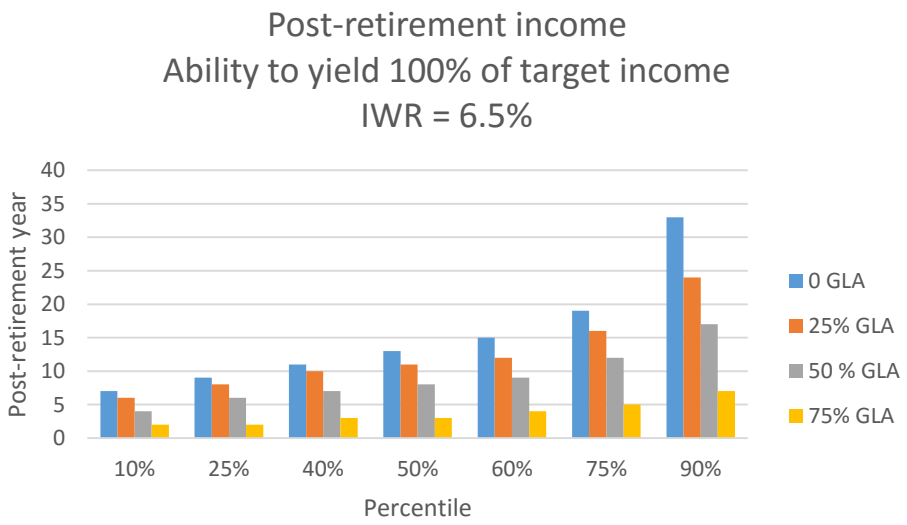


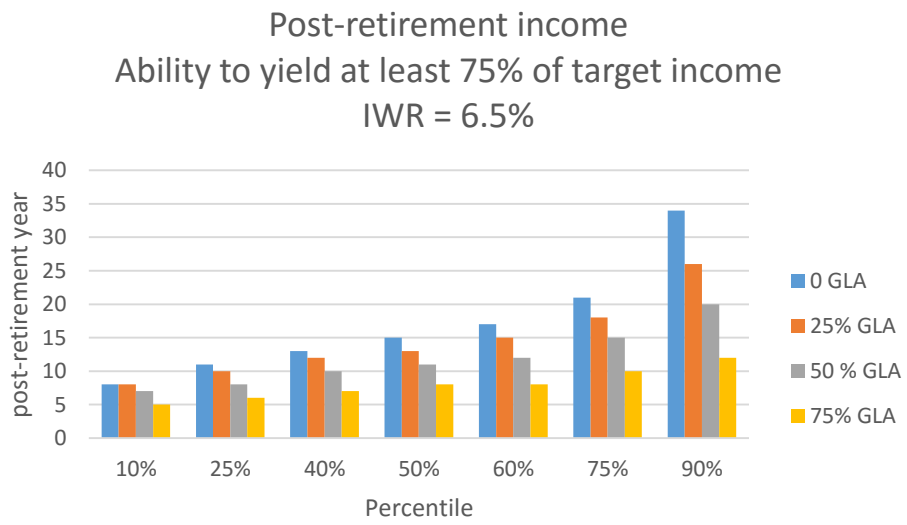
Summary: Target income objective Initial withdrawal rate = 5%



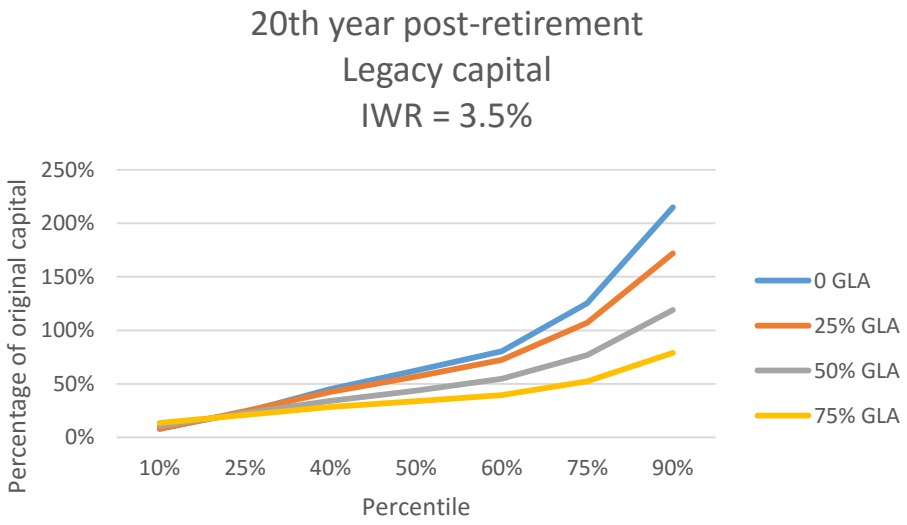


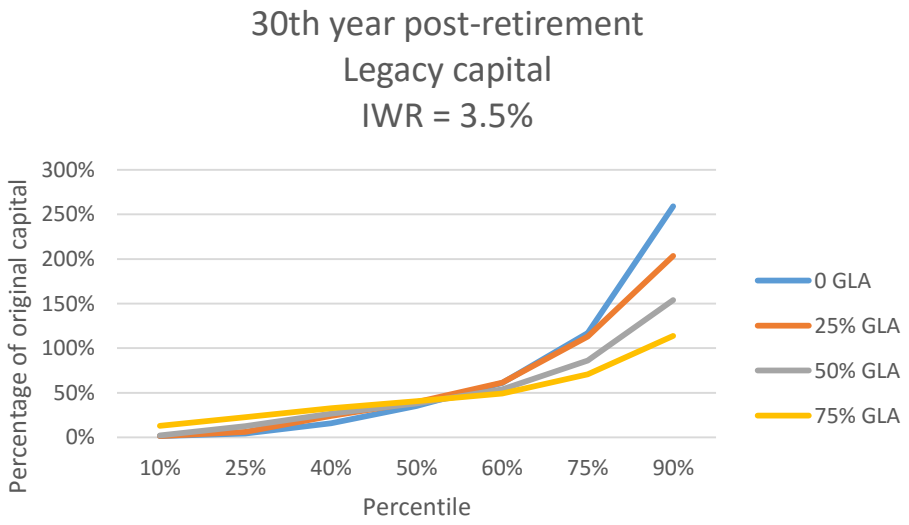
Summary: Target income objective
Initial withdrawal rate = 6.5%



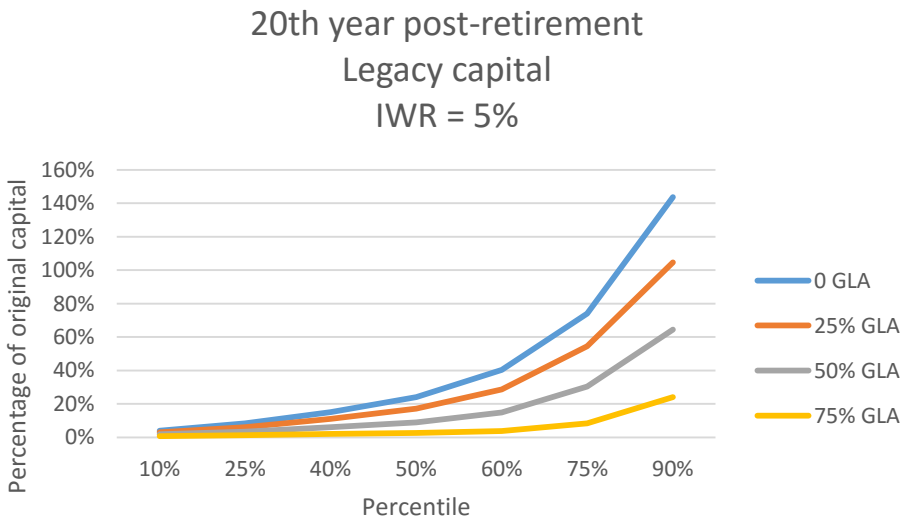


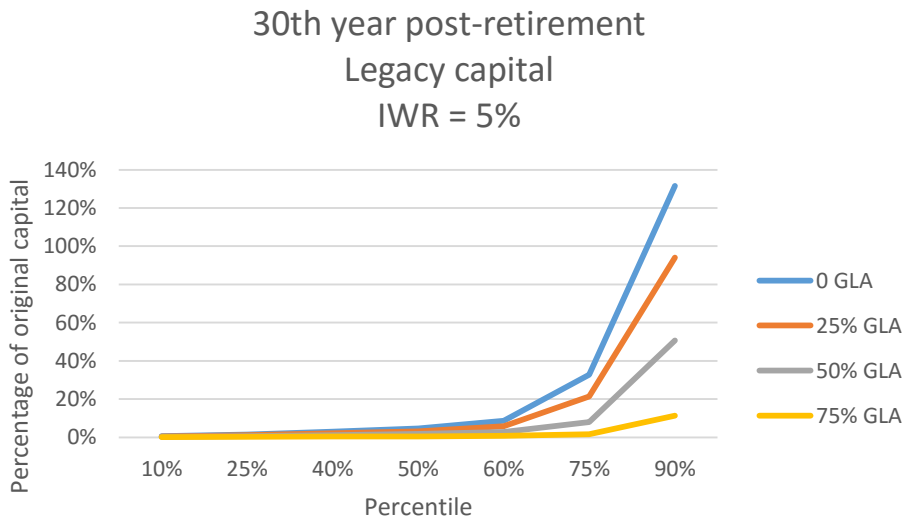
Summary: Legacy capital objective
Initial withdrawal rate = 3.5%



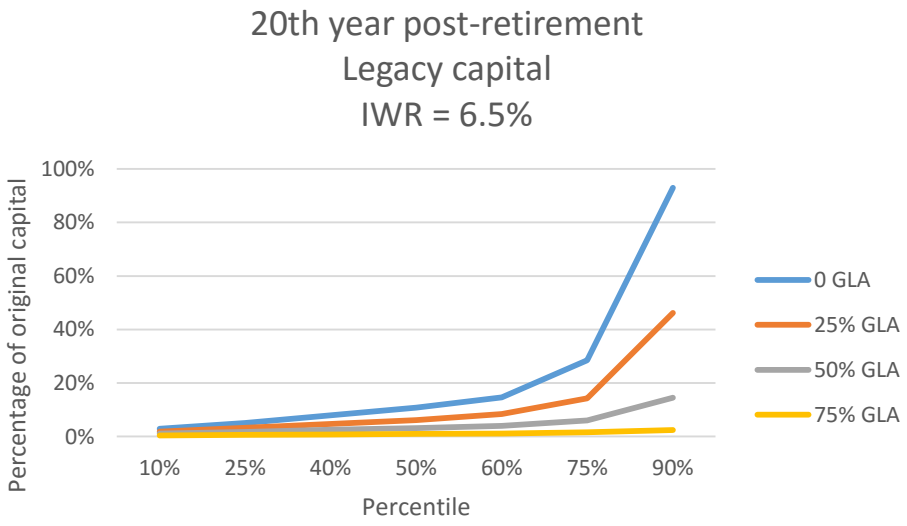


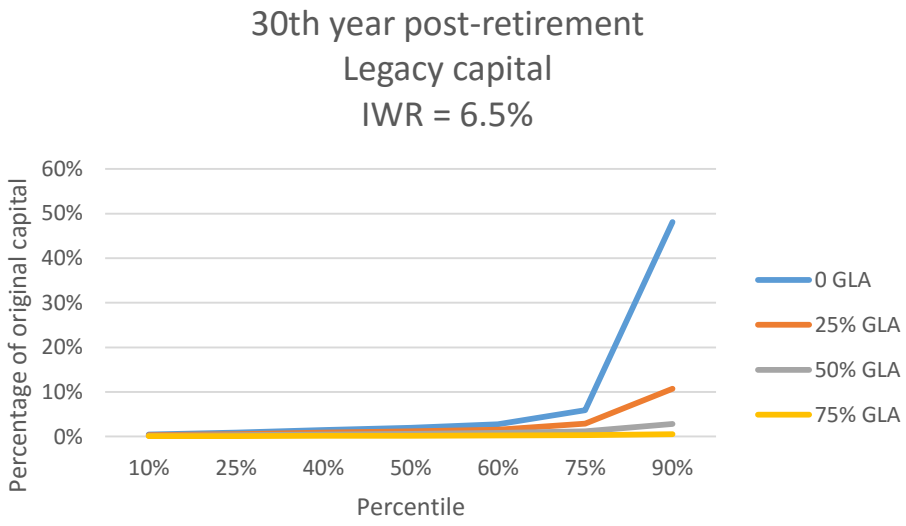
Summary: Legacy capital objective Initial withdrawal rate = 5%





Summary: Legacy capital objective
Initial withdrawal rate = 6.5%





Synopsis:

When having a “normal” to “optimistic” view of the future a full allocation to living annuities will always be favoured in stead of purchasing a guaranteed life annuity.

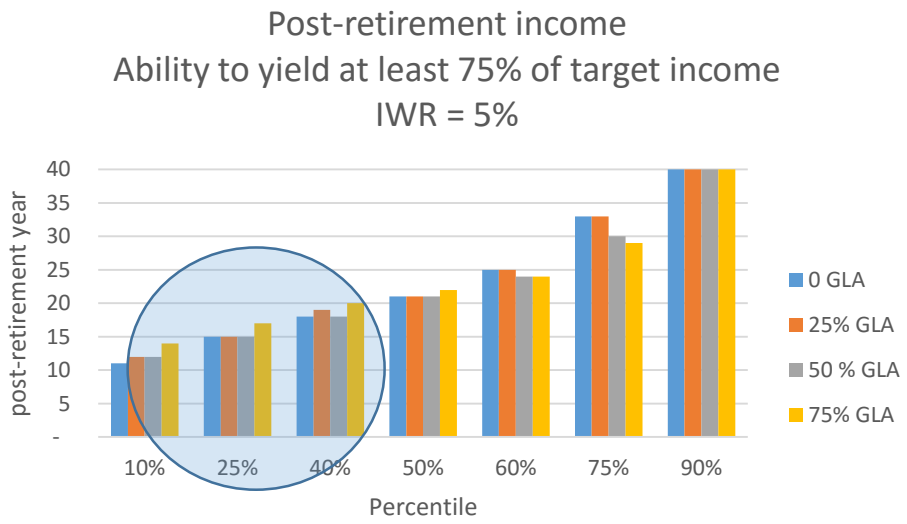
The analyses above confirm that the expected outcome of zero allocation to guaranteed life annuities (100% living annuities) will yield superior results most of the times i.r.o. meeting the *required income* **and** *legacy capital*.

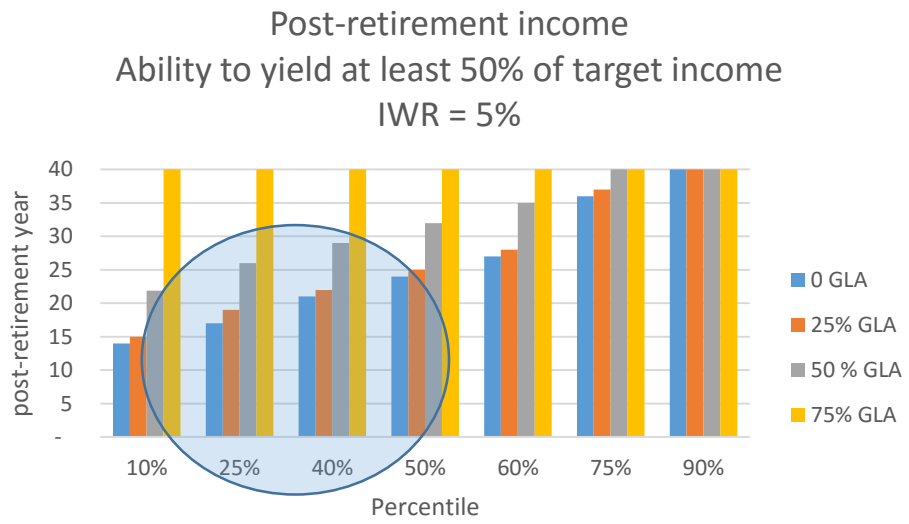
But what if you would not experience “normal” market conditions/expectations going forward?

The value of an GLA is basically similar to the value of insurance = protecting yourself against bad outcomes; in the context of retirement planning poor market returns and/or outliving your life expectancy.

Therefore, the potential value of an GLA should not be discarded as a viable option in some instances…

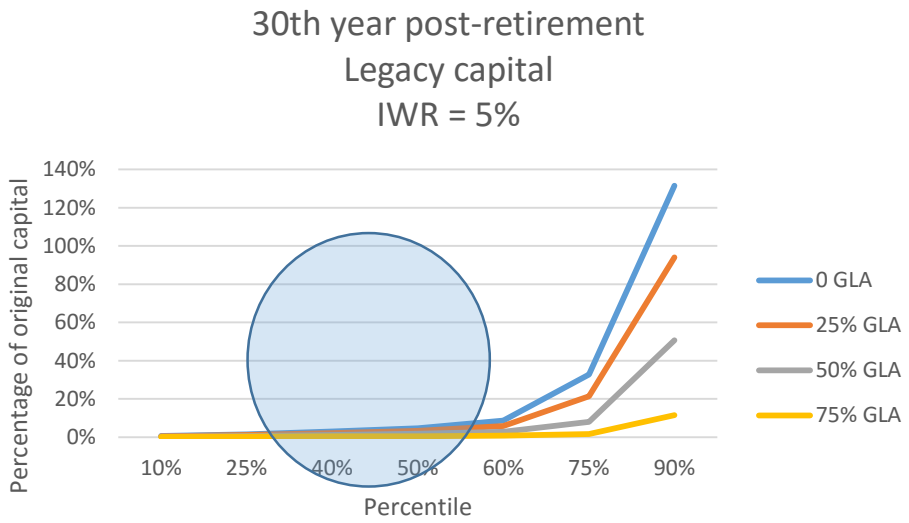
Dire market returns…securing annuity income

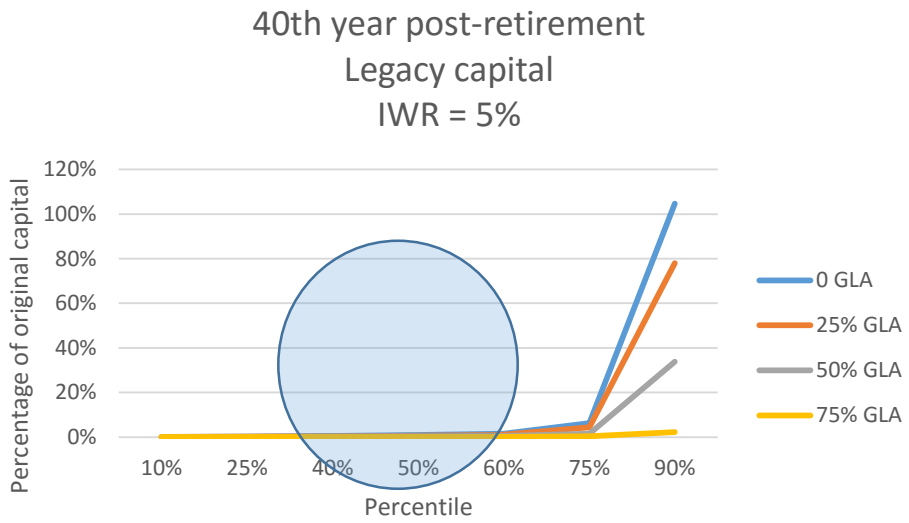




- Worse-than expected market returns…the inclusion of GLA safeguards some income stream for longer during the post-retirement period…

Living for longer…





- And won't make much of a difference to legacy capital available in any event... (except if you'll experience much better-than-expected market returns)

DRW

Investment Research

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