Outliving your annuity:

Exploring dynamic drawdown strategies

Kyle Hulett
Co-Head: Investments

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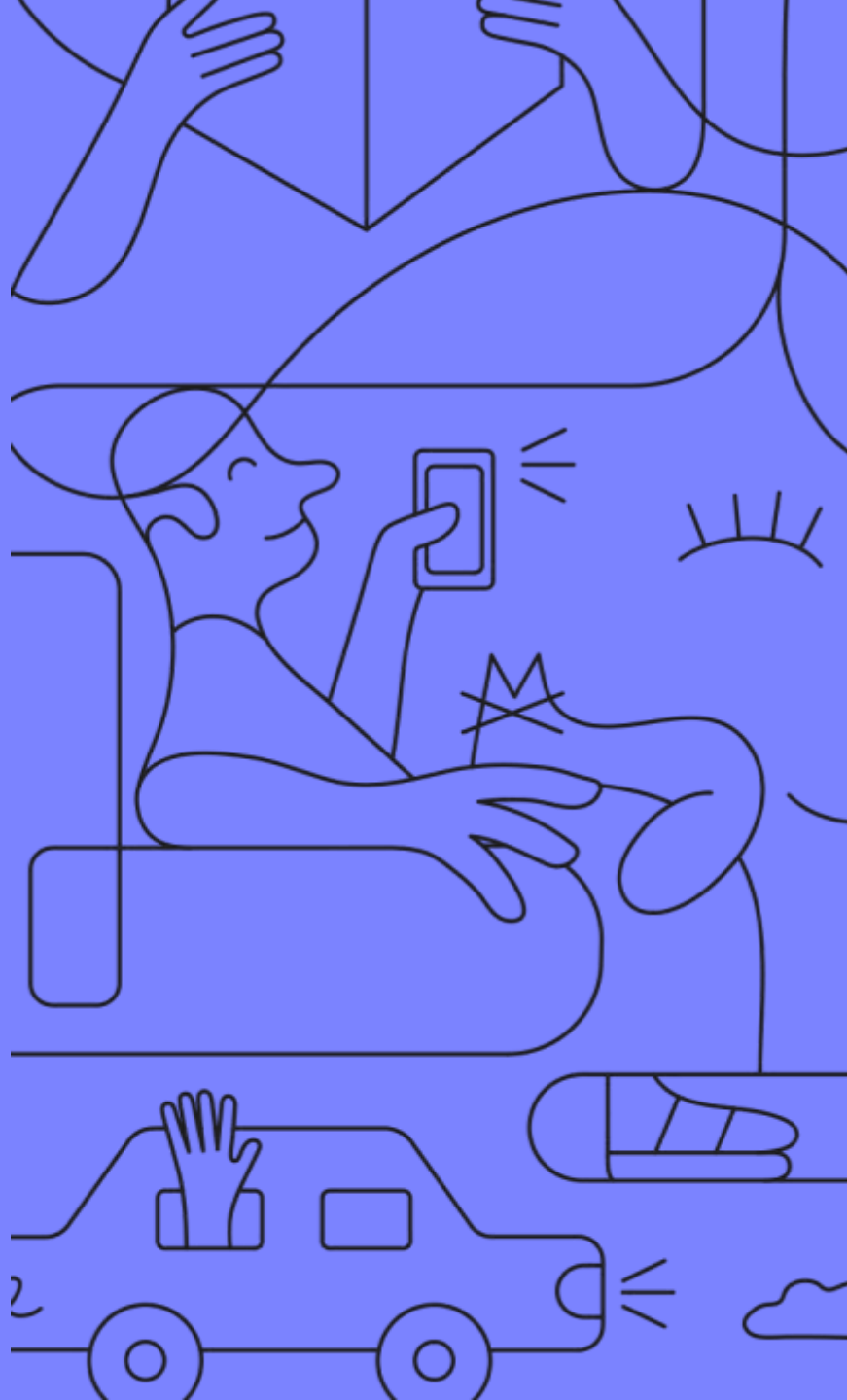


Introduction to the South African annuity market

Guaranteed (non-profit) life annuities

- Level payout over life
- Insurer bears investment and longevity risk
- Steep yield curve makes non-profit annuities attractive

Fixed-escalation guaranteed life annuities

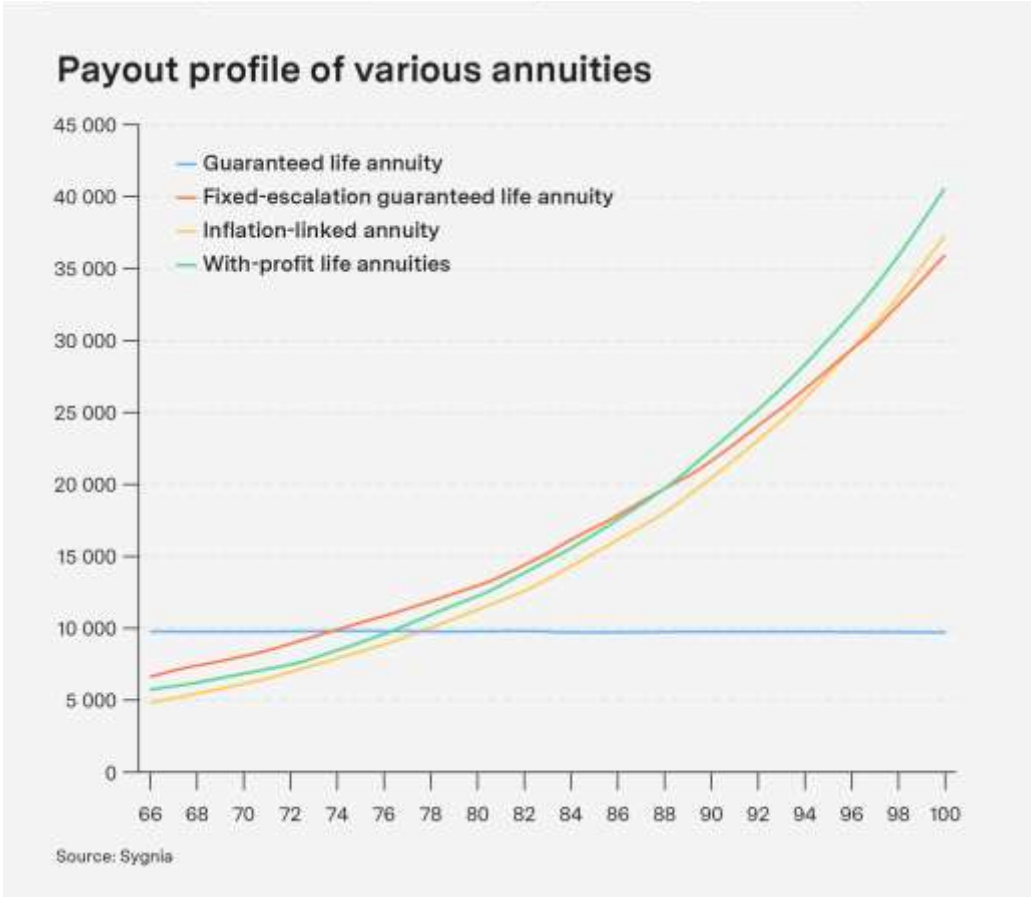
- 5% escalation guaranteed
- 30% lower starting point
- Inflation-linked unaffordable

With-profit life annuities

- Balanced asset mix, receive bonuses if returns are good
- Capital charge (1%), up to 45% lower starting value
- Offshore and equities hedge against hyperinflation

Living annuities

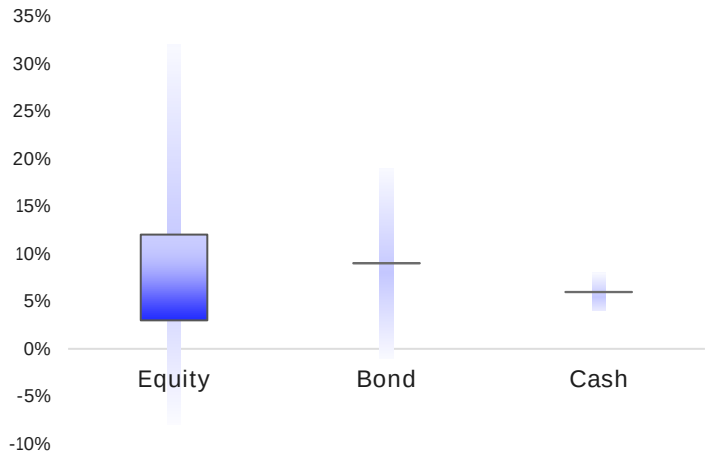
- Annuitant takes on longevity and investment risk
- 2.5% to 17.5% annual drawdown
- ASISA: Total AUM is R626bn, with average drawdown of 6.7%



Living annuity: Asset–liability mismatch

Assets
Accumulated retirement savings

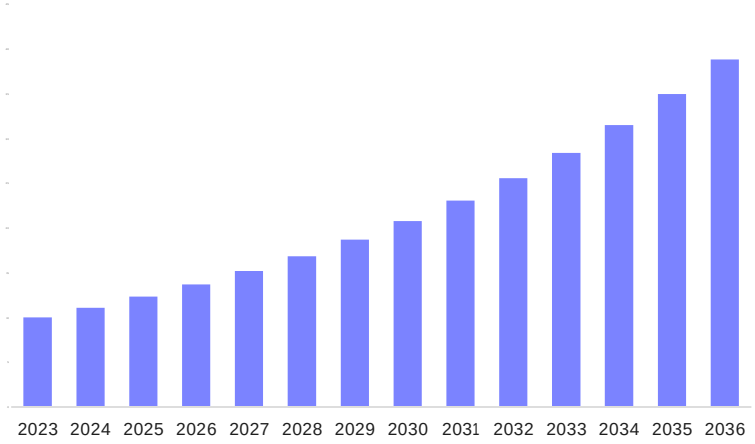
Equities: Real yield, high volatility
Bonds: Nominal yield, medium volatility
Cash: Nominal yield, low volatility



No perfect (affordable) asset hedge for expenses growing at inflation + 5%

Liabilities
Living expenses during retirement

Annual drawdown
5% yield increasing annually with inflation
= 5% real yield



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Modelling asset returns – two scenarios

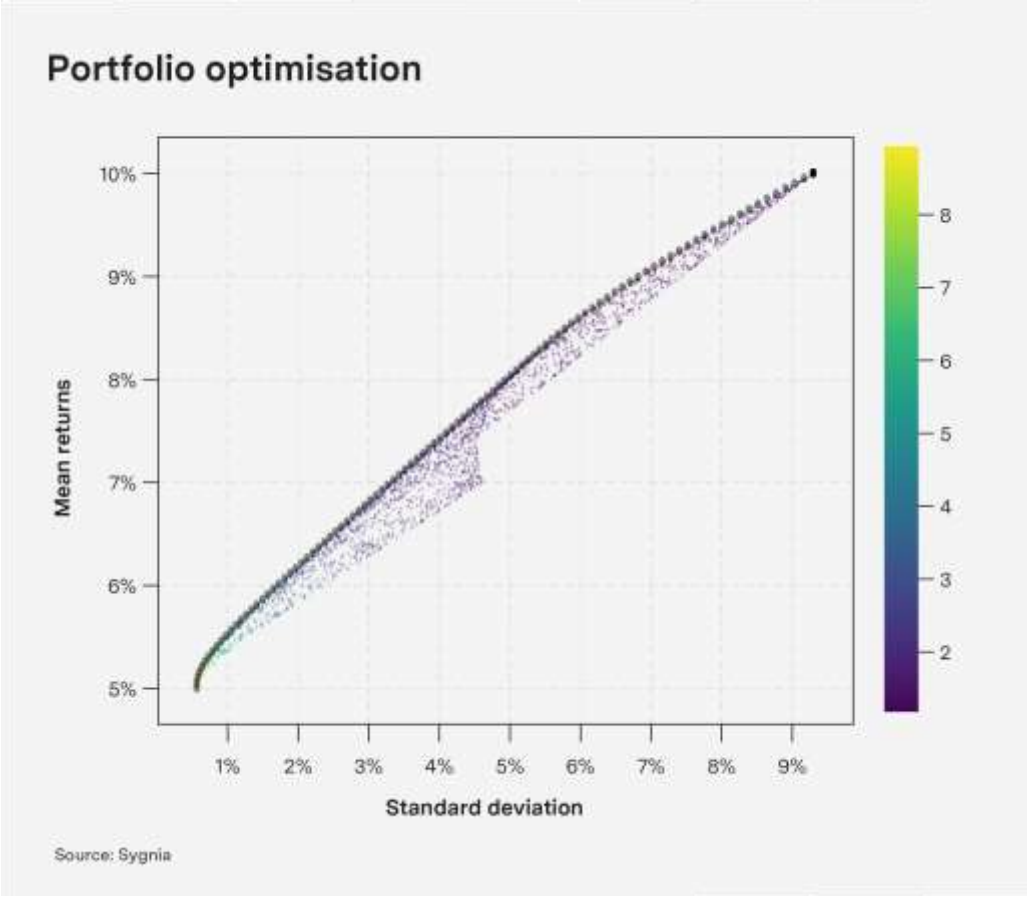
High inflation, high yield (inflation rate 6%)

- Cash: 7% (1% real)
- Bonds: 9% (3% real)
- Equities: 10% (4% real)
- This reflects the post-Covid environment. Inflation is likely to stay higher due to deglobalisation, supply chain security, energy security, onshoring and decarbonisation taxes.

Low inflation, low real yield (inflation rate 5%)

- Cash: 5% (0% real)
- Bonds: 7% (2% real)
- Equities: 10% (5% real)
- Great Financial Crisis (2008) and, prior to Covid (2020), a disinflationary environment driven by ageing populations, excess debt, a move to less capital-intensive economies and a lack of investment relative to cash.

60 000 simulations: 30 000 for each scenario, creating 17 optimal asset portfolios for each scenario.



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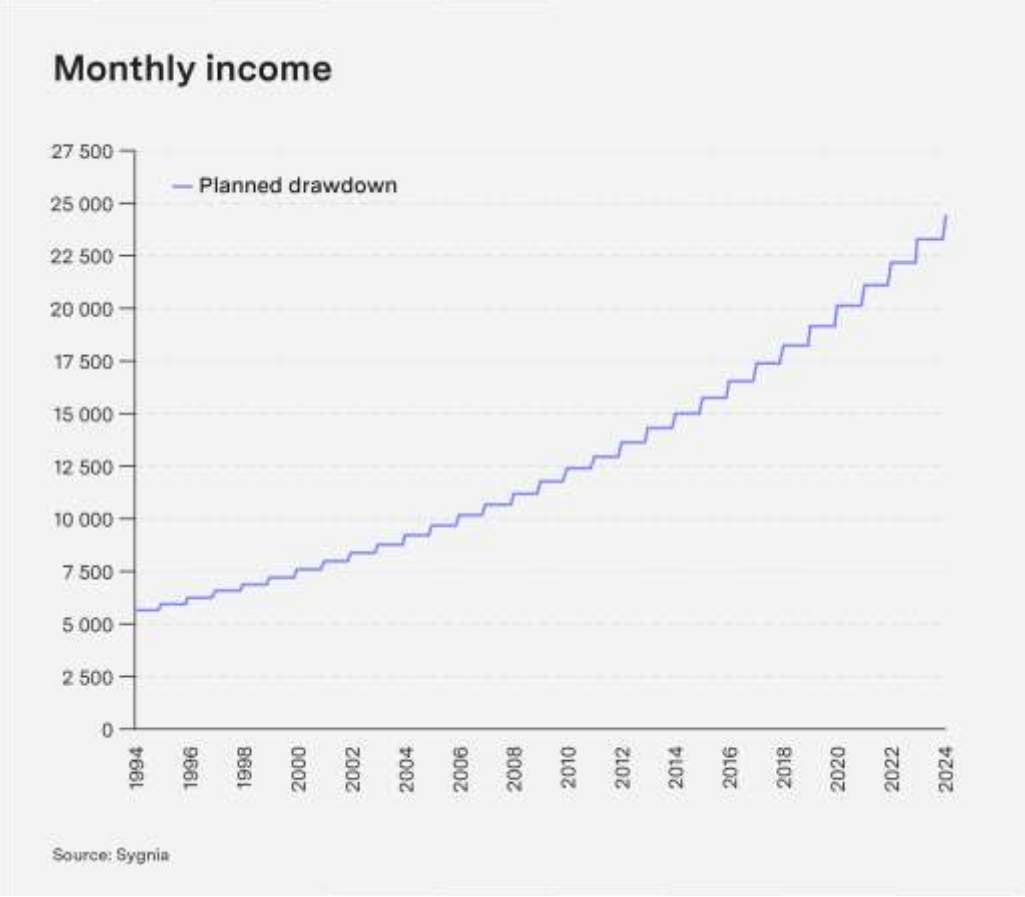
Modelling liability cash flows

Liability assumptions

- Payout to annuitant reviewed annually
- Portfolio rebalanced annually
- Payout increased with inflation annually
- Paid out monthly
- Tax free; no fees
- Ignored longevity risk. Mare 2016: South African conditional median life expectancy, given age 60, is 76 years for both sexes − but few people are average. Each liability term is 30 years/361 months.

200 000 simulations: 250 asset runs per scenario (high, low), per drawdown rate (3%, 5%, 7%, 9%), per optimal portfolio (1 to 17) and per drawdown method to identify sequencing risk (time to ruin).



Expected time to ruin – static drawdown method

High Inflation (7/9/10)			
	Cash	Bond	Equity
1	100%	0%	0%
2	90%	7%	3%
3	80%	15%	5%
4	70%	23%	7%
5	60%	30%	10%
6	50%	39%	11%
7	40%	47%	13%
8	30%	55%	15%
9	20%	62%	18%
10	10%	70%	20%
11	0%	78%	22%
12	0%	60%	40%
13	0%	50%	50%
14	0%	40%	60%
15	0%	30%	70%
16	0%	18%	82%
17	0%	9%	91%

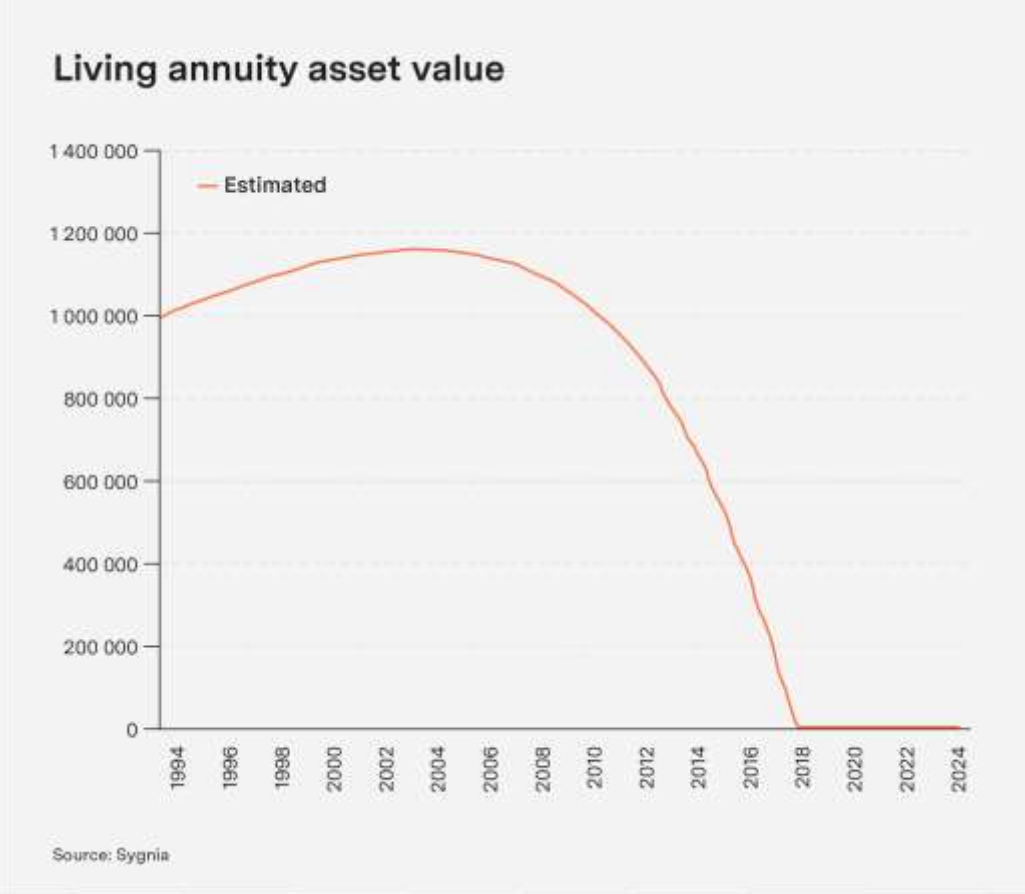
3.0% drawdown	5.0% drawdown	7.0% drawdown	9.0% drawdown
Average months	Average months	Average months	Average months
361	282	197	152
361	293	202	154
361	306	207	158
361	318	214	161
361	327	221	165
361	334	228	169
361	337	237	174
361	339	245	178
361	340	252	182
361	338	253	182
361	342	267	197
361	341	264	194
360	337	260	192
359	330	255	190
358	322	250	187
355	310	241	182
350	299	229	173

3.0% drawdown	5.0% drawdown	7.0% drawdown	9.0% drawdown
Minimum months	Minimum months	Minimum months	Minimum months
361	225	185	143
361	260	185	145
361	255	181	142
361	249	177	139
361	246	175	135
361	237	171	131
361	230	166	126
361	222	160	121
361	215	153	116
345	203	144	109
341	206	151	116
326	193	145	116
300	185	140	110
264	178	126	98
240	159	112	89
206	135	97	83
183	118	90	76

- “Average months” is the average time to ruin (ATTR) in months: 361 months is the maximum.
- To achieve the highest ATTR, the equity and bond allocations (risky assets) increase as the drawdown rate increases. Few are average.
- “Minimum months” is the minimum time to ruin (MTTR), being the shortest duration the savings lasted.
- Achieving the highest MTTR requires fewer risky assets.
- This summarises the asset–liability mismatch: while the average outcome improves with riskier assets, it is not feasible as it becomes more variable. One way to improve the mismatch between the risk and return is by dynamically managing the drawdown.

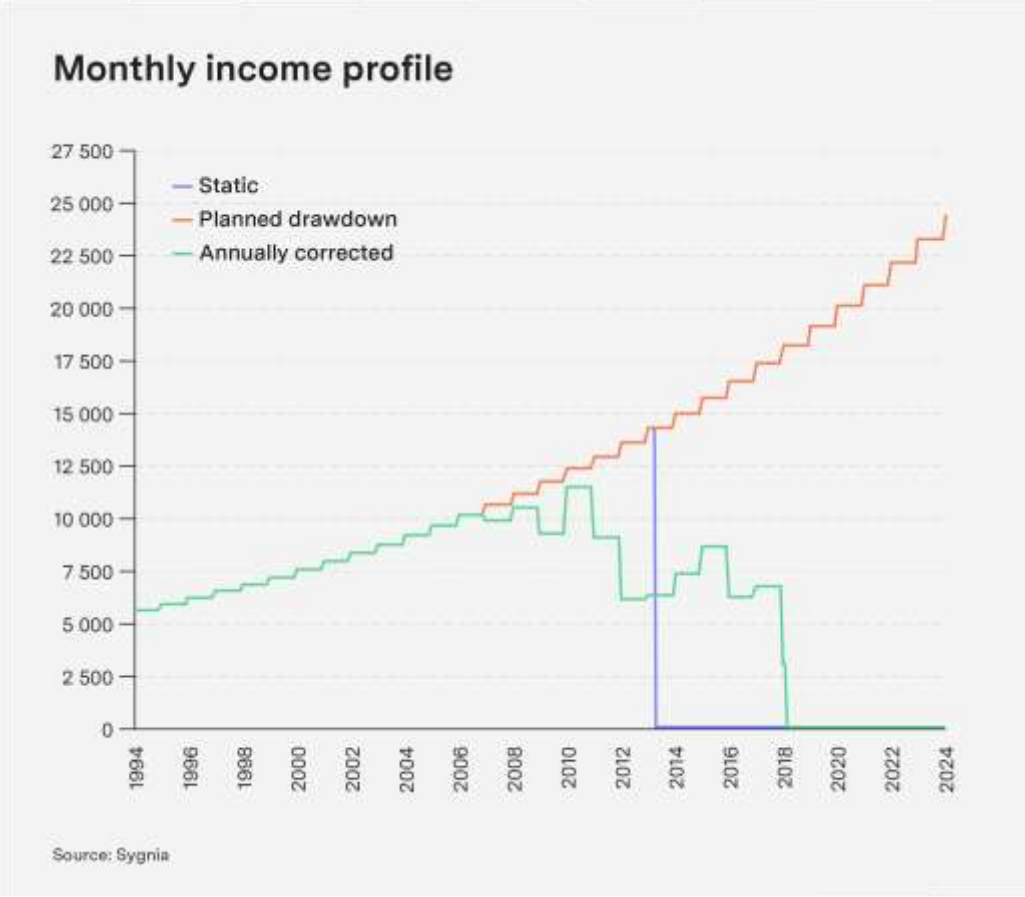
Dynamically adjusted drawdown rates

- Scott et al. (2009) are critical of withdrawing a static drawdown from an inherently volatile portfolio.
- We investigated methods in which the client takes on more market risk, giving them a higher probability of achieving their results in the long term – with the caveat that if the market underperforms in the short term, the client will have to accept a lower income to avoid depleting capital. This would require significant discussion with a financial advisor.
- Effectively turns a living annuity into a type of self-insured with-profit annuity.
- We reviewed two broad model methods, both of which require forecasted market returns: (i) forces the client to engage with a realistic drawdown rate relative to the set of return assumptions; and (ii) allows the client to systematically change their behaviour based on the market.
- The discussion is as important as the assumptions.



Annual annuity adjustment

- The first dynamic drawdown method relied on the work of Barton and Siegel (2015).
- The market value of available capital is reviewed annually using assumed market return assumptions for each asset class. The optimal annual payment for the analysis' duration (based on original estimated term) is then calculated.
- In essence, this is like the investor buying a guaranteed life annuity every year, but without the guarantee and with the income valid for one year.
- The upside to this method is that the annuitant will never run out of money (up to the expected term).
- The downside is that their income could become almost negligible.
- Another downside is that the annual drawdown will be very volatile.



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Dynamic drawdown based on estimated capital

- The second dynamic drawdown method creates a dynamic drawdown trigger based on the market value of the annuitant’s capital relative to the estimated projected capital base.
- Markets, like the economies they are based on, are cyclical, and it is this cyclicality that the dynamic capital method attempts to harness to avoid eating into capital at the worst time.

Dynamic drawdown based on estimated capital

- Trigger: When to reduce the drawdown
    1. Capital falls below estimated value
    2. Capital falls 10% below estimated value – markets have fallen more than 10% once every two years
    3. Capital falls 20% below estimated value – linked to recession definition
- Haircut: How much to reduce the drawdown
    1. No inflationary increases
    2. No inflation increase plus a 5% haircut to annual income
    3. No inflation increase plus a further 5% haircut (taking it to 10% in total)

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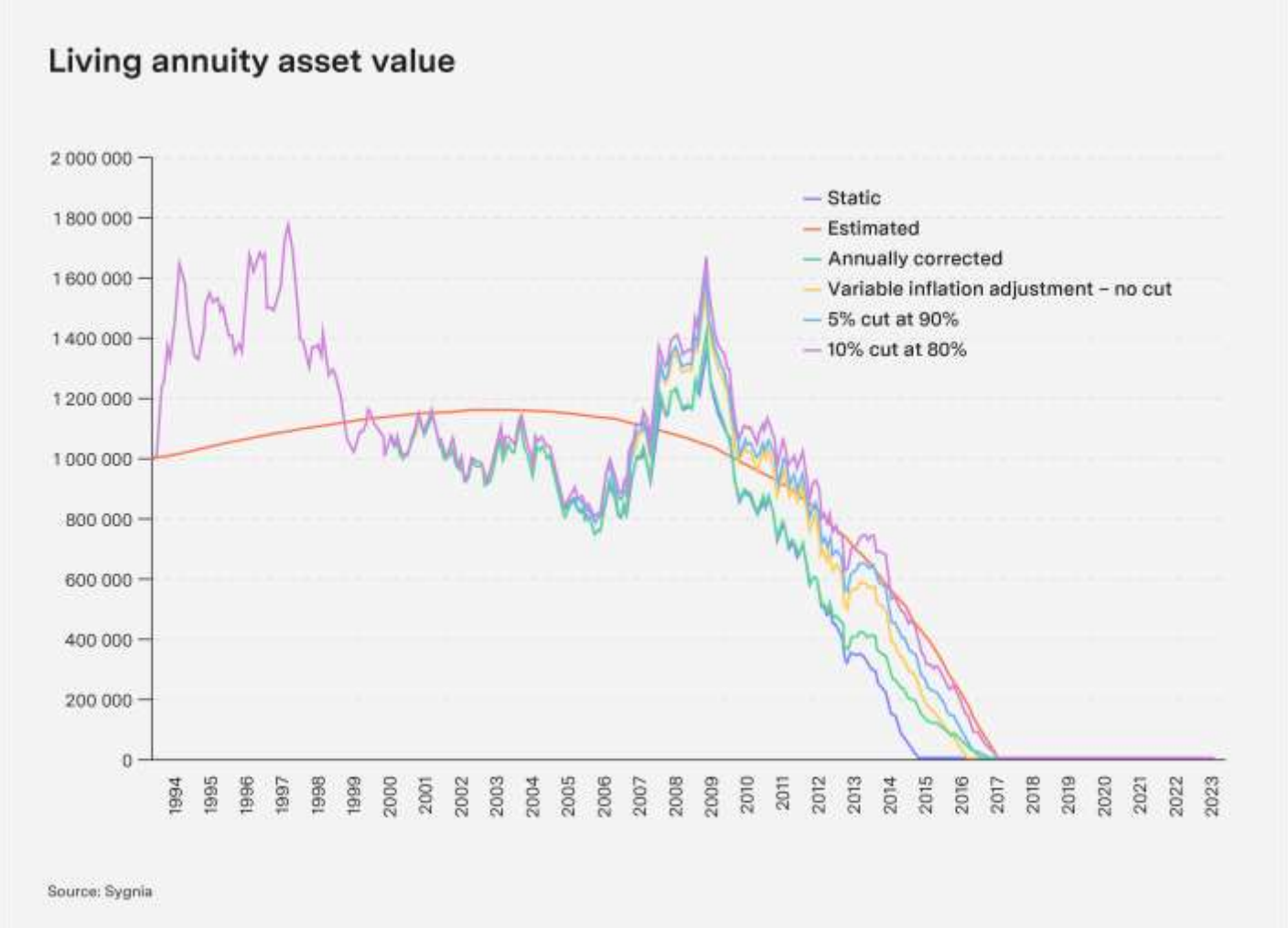
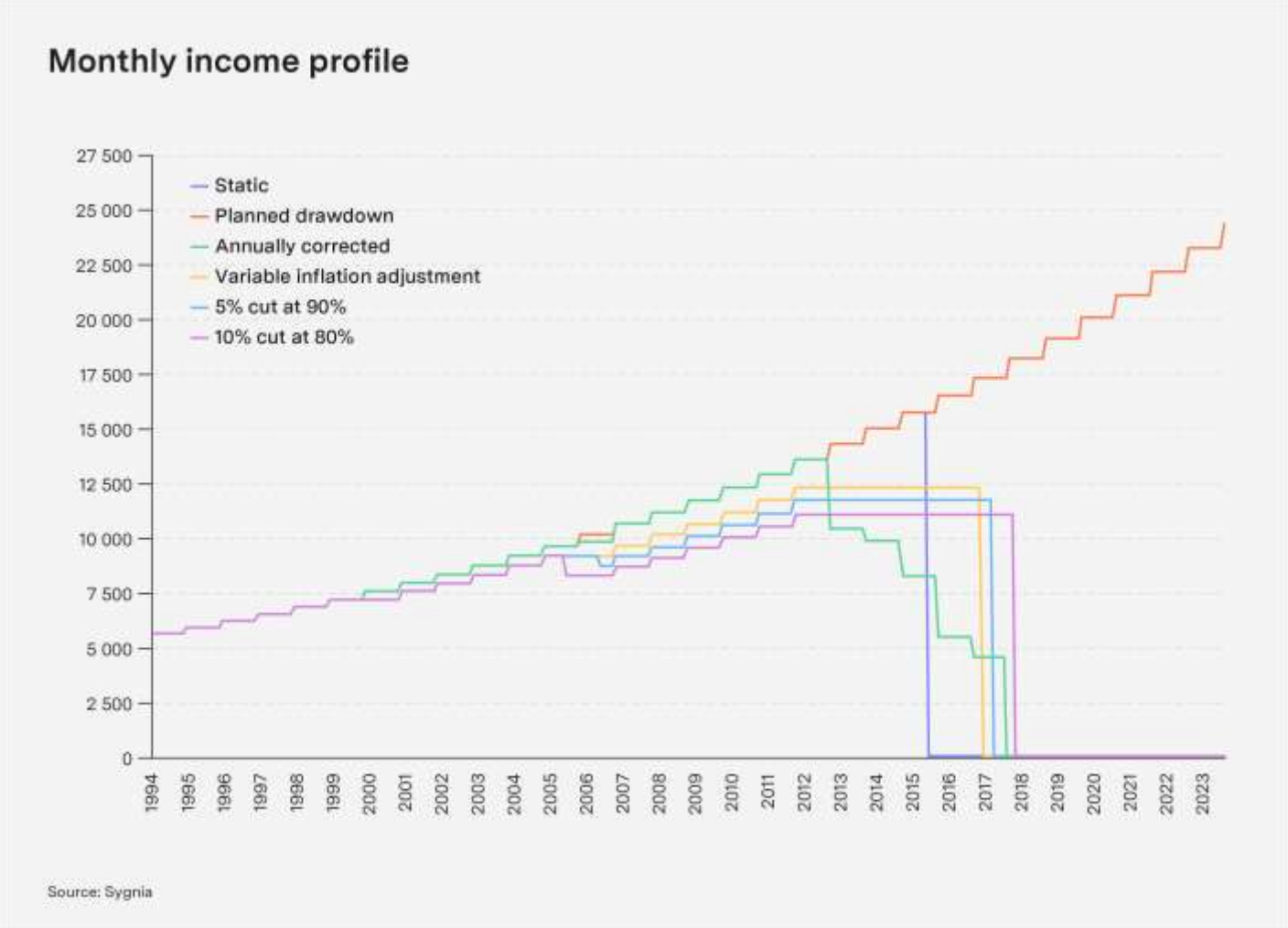
Dynamic drawdown strategies

Dynamic drawdown based on estimated capital



Dynamic drawdown based on estimated capital



Analysis of 3% drawdown – dynamic capital method

- Static is fine for 3% drawdown, as the capital will last the full term (even on MTTR) with a conservative to moderate asset allocation.
- Dynamic drawdown allows the additional riskier asset allocation to improve the overall payout while keeping the worst-case outcome (MTTR) the same. Only a 5% haircut is required.
- Up to the investor’s risk appetite: from 100% cash to 75% equity.
- The low inflation scenario has a slightly better overall result.

High Inflation (7/9/10)				3.0% drawdown				3.0% drawdown			
				Static	No inflation	5% cut	10% cut	Static	No inflation	5% cut	10% cut
	Cash	Bond	Equity	Average months				Minimum months			
1	100%	0%	0%	361	361	361	361	361	361	361	361
2	90%	7%	3%	361	361	361	361	361	361	361	361
3	80%	15%	5%	361	361	361	361	361	361	361	361
4	70%	23%	7%	361	361	361	361	361	361	361	361
5	60%	30%	10%	361	361	361	361	361	361	361	361
6	50%	39%	11%	361	361	361	361	361	361	361	361
7	40%	47%	13%	361	361	361	361	361	361	361	361
8	30%	55%	15%	361	361	361	361	361	361	361	361
9	20%	62%	18%	361	361	361	361	361	361	361	361
10	10%	70%	20%	361	361	361	361	345	361	361	361
11	0%	78%	22%	361	361	361	361	341	361	361	361
12	0%	60%	40%	361	361	361	361	326	361	361	361
13	0%	50%	50%	360	361	361	361	300	351	361	361
14	0%	40%	60%	359	360	361	361	264	307	315	351
15	0%	30%	70%	358	360	360	360	240	262	267	283
16	0%	18%	82%	355	358	359	359	206	234	238	248
17	0%	9%	91%	350	356	357	358	183	207	211	223

Low Inflation (5/7/10)				3.0% drawdown				3.0% drawdown			
				Static	No inflation	5% cut	10% cut	Static	No inflation	5% cut	10% cut
	Cash	Bond	Equity	Average months				Minimum months			
1	100%	0%	0%	361	361	361	361	361	361	361	361
2	90%	5%	5%	361	361	361	361	361	361	361	361
3	80%	10%	10%	361	361	361	361	361	361	361	361
4	70%	17%	13%	361	361	361	361	361	361	361	361
5	60%	23%	17%	361	361	361	361	361	361	361	361
6	50%	28%	22%	361	361	361	361	361	361	361	361
7	40%	35%	25%	361	361	361	361	361	361	361	361
8	30%	40%	30%	361	361	361	361	361	361	361	361
9	20%	45%	35%	361	361	361	361	361	361	361	361
10	5%	55%	40%	361	361	361	361	361	361	361	361
11	0%	55%	45%	361	361	361	361	361	361	361	361
12	0%	45%	55%	361	361	361	361	361	361	361	361
13	0%	35%	65%	360	361	361	361	335	361	361	361
14	0%	25%	75%	359	361	361	361	284	361	361	361
15	0%	15%	85%	357	359	360	361	235	304	323	350
16	0%	5%	95%	350	356	357	358	196	236	250	282
17	0%	0%	100%	351	357	357	359	202	252	267	283

Analysis of 5% drawdown – dynamic capital method

- Mare (2016) showed that a 5% withdrawal rate is sustainable for South Africans only over short periods (15 years or less).
- Dynamic drawdown is required to ensure that the ATTR reaches 30 years.
- Higher dynamic drawdown haircuts allow for more risky assets and an overall better MTTR, lasting nearly 30 years.
- 55% bond & 15% equity (high inflation) and 45% bond & 35% equity (low inflation).
- Dynamic drawdown improves MTTR by up to ten years.

High Inflation (7/9/10)

	Cash	Bond	Equity
1	100%	0%	0%
2	90%	7%	3%
3	80%	15%	5%
4	70%	23%	7%
5	60%	30%	10%
6	50%	39%	11%
7	40%	47%	13%
8	30%	55%	15%
9	20%	62%	18%
10	10%	70%	20%
11	0%	78%	22%
12	0%	60%	40%
13	0%	50%	50%
14	0%	40%	60%
15	0%	30%	70%
16	0%	18%	82%
17	0%	9%	91%

5.0% drawdown

Static	No inflation	5% cut	10% cut
Average months			
282	304	306	304
293	314	315	314
306	329	331	329
318	344	346	345
327	353	354	354
334	358	358	359
337	359	360	360
339	359	360	361
340	359	360	361
338	358	359	360
342	359	359	361
341	359	360	360
337	358	359	360
330	356	357	359
322	353	354	357
310	344	347	352
299	333	338	346

5.0% drawdown

Static	No inflation	5% cut	10% cut
Minimum months			
225	281	282	282
260	290	290	290
255	298	298	298
249	307	307	307
246	318	318	318
237	319	329	329
230	307	319	342
222	296	305	353
215	290	299	326
203	262	275	316
206	267	280	318
193	250	264	305
185	253	260	278
178	230	237	249
159	208	214	222
135	186	195	199
118	153	162	164

Low Inflation (5/7/10)

	Cash	Bond	Equity
1	100%	0%	0%
2	90%	5%	5%
3	80%	10%	10%
4	70%	17%	13%
5	60%	23%	17%
6	50%	28%	22%
7	40%	35%	25%
8	30%	40%	30%
9	20%	45%	35%
10	5%	55%	40%
11	0%	55%	45%
12	0%	45%	55%
13	0%	35%	65%
14	0%	25%	75%
15	0%	15%	85%
16	0%	5%	95%
17	0%	0%	100%

5.0% drawdown

Static	No inflation	5% cut	10% cut
Average months			
252	268	270	268
263	277	278	277
277	293	294	293
290	310	312	311
304	327	330	330
315	340	343	344
324	351	353	354
330	357	358	359
333	358	359	360
329	353	355	359
347	357	358	360
339	356	357	360
336	352	354	358
333	347	349	355
326	341	344	349
317	334	337	341
322	338	340	344

5.0% drawdown

Static	No inflation	5% cut	10% cut
Minimum months			
239	252	252	252
246	264	264	264
248	276	276	276
245	287	287	287
244	295	300	300
244	291	301	312
242	300	313	327
240	294	308	333
235	301	316	345
219	266	278	311
224	282	294	337
201	252	266	298
180	217	229	261
168	184	190	208
158	174	178	191
150	168	171	179
154	170	173	180

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Analysis of 7% drawdown – dynamic capital method

- ASISA 6.7% average drawdown rate.
- Van Appel et al. (2021) found that withdrawal rates in excess of 5% are not sustainable over a 30-year period.
- The full 30-year period cannot be achieved, but the MTTR improves to 20 years using dynamic drawdowns.
- Dynamic drawdown allows for a higher equity and bond mix to improve the MTTR.
- ATTR requires more equity and bonds than 5% drawdown to improve the outcome.
- However, the MTTR limits the equity/bond mix, with the optimal solution less risky than the 5% drawdown.

High Inflation (7/9/10)

	Cash	Bond	Equity	7.0% drawdown: Assumed (with vol.)	Adjusted – no cut	Adjusted – 5% cut	Adjusted – 10% cut	7.0% drawdown: Assumed (with vol.)	Adjusted – no cut	Adjusted – 5% cut	Adjusted – 10% cut
				Average months				Minimum months			
1	100%	0%	0%	197	212	213	212	185	197	198	197
2	90%	7%	3%	202	215	216	215	185	200	200	200
3	80%	15%	5%	207	222	223	222	181	203	204	203
4	70%	23%	7%	214	229	230	229	177	208	208	208
5	60%	30%	10%	221	237	239	239	175	206	212	215
6	50%	39%	11%	228	249	251	252	171	206	213	217
7	40%	47%	13%	237	260	263	266	166	199	206	219
8	30%	55%	15%	245	270	272	277	160	192	199	211
9	20%	62%	18%	252	279	282	289	153	186	194	216
10	10%	70%	20%	253	280	284	292	144	177	183	191
11	0%	78%	22%	267	302	306	313	151	187	193	203
12	0%	60%	40%	264	307	313	323	145	207	217	230
13	0%	50%	50%	260	306	313	326	140	194	199	208
14	0%	40%	60%	255	301	307	322	126	169	180	196
15	0%	30%	70%	250	298	306	320	112	153	163	170
16	0%	18%	82%	241	291	299	312	97	121	128	129
17	0%	9%	91%	229	272	279	293	90	106	111	111

Low Inflation (5/7/10)

	Cash	Bond	Equity	7.0% drawdown: Assumed (with vol.)	Adjusted – no cut	Adjusted – 5% cut	Adjusted – 10% cut	7.0% drawdown: Assumed (with vol.)	Adjusted – no cut	Adjusted – 5% cut	Adjusted – 10% cut
				Average months				Minimum months			
1	100%	0%	0%	182	193	194	193	172	183	183	183
2	90%	5%	5%	187	197	198	197	177	187	187	187
3	80%	10%	10%	194	203	204	203	177	194	194	194
4	70%	17%	13%	200	212	213	212	176	197	197	197
5	60%	23%	17%	207	221	222	222	175	196	201	203
6	50%	28%	22%	216	231	232	233	176	199	204	208
7	40%	35%	25%	225	244	246	246	173	204	209	215
8	30%	40%	30%	236	254	256	258	171	198	205	212
9	20%	45%	35%	246	266	269	272	168	191	196	205
10	5%	55%	40%	239	257	259	265	159	174	178	186
11	0%	55%	45%	263	291	296	304	165	194	201	217
12	0%	45%	55%	267	298	303	312	155	178	185	197
13	0%	35%	65%	270	303	309	319	146	168	173	181
14	0%	25%	75%	272	306	310	320	138	157	160	167
15	0%	15%	85%	270	301	306	318	117	150	154	160
16	0%	5%	95%	257	281	286	296	104	132	143	147
17	0%	0%	100%	273	303	309	319	110	147	150	155

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Conclusion

- Living annuities have an important part to play in South Africa given the high inflation environment, probability of hyperinflation and the high costs of guaranteed escalating, inflation-linked and with-profit annuities.
- The dynamic drawdown annuity correction method does not improve average payouts for the client.
- Dynamic drawdown using the estimated capital method allows a riskier asset allocation to achieve not only a better average time to ruin but a better overall minimum time to ruin.
- This analysis shows that **a client's total retirement payout can be improved by allowing exposure** to a higher return/risk asset allocation mix and by reducing spending in tough years. It can be used to create a low-cost, self-insuring with-profit annuity alternative.
- The success of the method will depend on the return assumptions used and the threshold and trigger levels. Importantly, the process creates a tool that allows the advisor and client to achieve this better outcome systematically.

Investment options for growth and income

Growth asset:

Sygnia FANG.AI Fund

- Provides exposure to companies that use advanced technologies to acquire and retain users, including industry-disrupting technologies such as artificial intelligence, large language models, cloud storage, big data, social media and e-commerce tools.

Income asset:

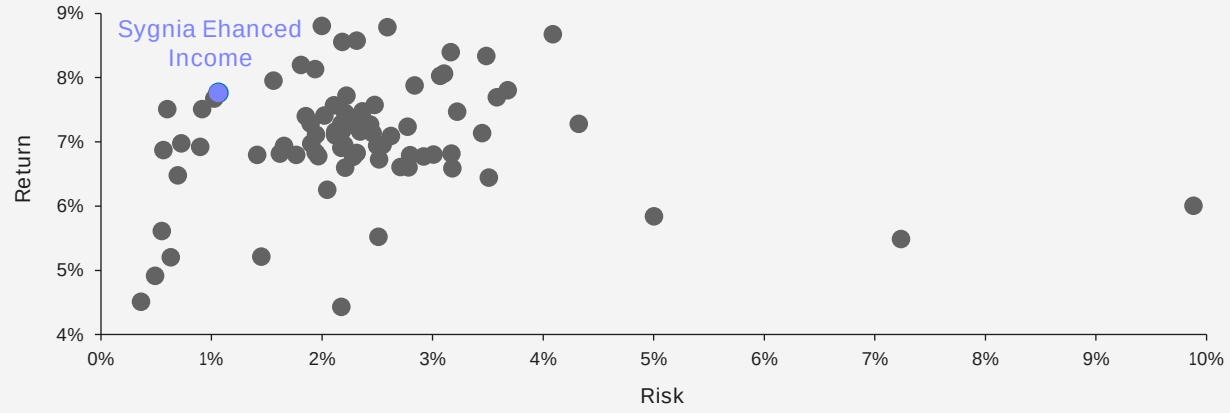
Sygnia Enhanced Income Fund

- Low volatility, low to zero allocation to property and bonds.
- Maximum yield through term premium.
- Current yield of 10.9% (Feb 2024).

Top 10 holdings	
Meta Platforms	11.2%
Microsoft	11.1%
Amazon	11.0%
Alphabet	10.9%
Apple	10.4%
NVIDIA	10.3%
Netflix	6.2%
Snowflake	6.1%
Tesla	5.9%
Broadcom	5.9%

ASISA Jan 2024	Sygnia Enhanced Income Fund	Sygnia FANG.AI Equity Fund
1 year	9 out of 115	1 out of 105
3 years	14 out of 105	6 out of 79
5 years	14 out of 81	1 out of 57

Five-year risk/return scatter plot to Jan 2024 – ASISA Multi-Asset Income Category



Thank you

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Information about Sygnia:

Physical address: 7th Floor, The Foundry, Cardiff Street, Green Point, 8001
Postal address: PO Box 51591, The Waterfront, 8002
Tel: 021 446 4940
Fax: 021 446 4950

Email: info@sygnia.co.za

Sygnia