

DRW Investment Research

The Short Series on Retirement Planning

Edition 2



**Retirement income drawdown strategies:
Evaluating different drawdown rules**

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You have retired from your retirement fund and will not earn any formal employment income in the future, i.e. you're dependant on the income from your retirement fund to meet your current and future financial needs. You've elected to transfer the proceeds from your retirement fund to a living annuity (ILLA) product. Initially, you had to make two important choices, namely the portfolio selection (investment fund choices) and the income level required from your living annuity – typically between 2.5% and 17.5% of the capital value.

Twelve months later the product provider (administrator of the living annuity product) will contact you to revise your income needs for the forthcoming year. Do you simply based that income decision on what it was now plus an allowance for an increase in living expenses, say, in line with the prevailing inflation rate, or do you consider how your investment portfolio fared over the past twelve months and therefore adjust your income needs accordingly, or simply, what you think you'll need going forward, irrespective of how your portfolio performed recently and overall inflation trends?

This article focusses on the above type of annuity income choices that a living annuity retiree must make during the annual income review stage, and may have a profound effect on the long-term sustainability of your retirement plan.

Drawdown rules

First, let me identify possible annuity income withdrawal or drawdown rules – there are probably an infinite number of possibilities that one can employ, but for this study I listed four main types of rules:

Fixed percentage

Each year the same withdrawal rate is selected, for example, 5% of retirement capital. The underlying performance of your investment portfolio plays a direct role in the income that will be available at review. Some overriding provisions, however, will apply – the income for the forthcoming year may not be less than the preceding year, i.e. it means if the income calculated (withdrawal rate x retirement capital value at start of review period) for the forthcoming year would be less than the previous year, an amount equal to that of the previous year will be elected and therefore this intervention will breach the fixed percentage rule. Furthermore, the income selected at review stage may never be less than 2.5% or exceed 17.5% of retirement capital.

Inflation-adjusted annuity income

Each year the previous year's annuity income and then adjusted by the prevailing inflation rate is selected, irrespective how your underlying investment portfolio performed. The income selected at review stage may never be less than 2.5% or exceed 17.5% of retirement capital, therefore this rule will be breached whenever any of these conditions will apply.

Target drawdown percentage

Income at review stage is selected based upon a pre-determined targeted withdrawal or drawdown rate (described below) and dependant on the remainder of the expected lifespan of the retirement plan. Investment portfolio performance will have a direct influence on the income amount available

at review stage. Again, some overriding provisions to this rule will apply. The income of the forthcoming period may not be less than the preceding period. Furthermore, the income selected at review period may never be less than 2.5% or exceed 17.5% of retirement capital.

The pre-determined target drawdown rate is based on the maximum (“ceiling”) percentage that can be withdrawn each year without jeopardising the long-term sustainability of the plan. Each year’s target drawdown rate considers the remainder of the expected lifespan of the plan, i.e. life expectancy. More specifically, each year’s escalation in the target rate will be such that the maximum withdrawal rate of 17.5% is only likely to be reached by the 30th year of the post-retirement plan.

For example, using a conservative portfolio return assumption of 8.5% p.a. over time, I calculated the following target drawdown percentages for each year of the post-retirement period, starting off with different initial drawdown rates at the inception of the plan.

Post-retirement period	Initial Drawdown Rate				
	3%	4%	5%	6%	7%
1	3.0%	4.0%	5.0%	6.0%	7.0%
2	3.1%	4.1%	5.1%	6.1%	7.1%
3	3.2%	4.2%	5.2%	6.1%	7.1%
4	3.3%	4.3%	5.2%	6.2%	7.2%
5	3.4%	4.4%	5.3%	6.3%	7.2%
6	3.5%	4.5%	5.4%	6.4%	7.3%
7	3.6%	4.6%	5.5%	6.5%	7.4%
8	3.7%	4.7%	5.6%	6.6%	7.5%
9	3.9%	4.8%	5.8%	6.7%	7.6%
10	4.0%	5.0%	5.9%	6.8%	7.7%
11	4.2%	5.1%	6.0%	7.0%	7.8%
12	4.3%	5.3%	6.2%	7.1%	7.9%
13	4.5%	5.5%	6.4%	7.3%	8.0%
14	4.7%	5.7%	6.6%	7.4%	8.2%

Post-retirement period	Initial Drawdown Rate				
	3%	4%	5%	6%	7%
15	5.0%	5.9%	6.8%	7.6%	8.4%
16	5.2%	6.2%	7.0%	7.9%	8.5%
17	5.5%	6.4%	7.3%	8.1%	8.8%
18	5.8%	6.7%	7.5%	8.4%	9.0%
19	6.1%	7.1%	7.9%	8.7%	9.2%
20	6.5%	7.4%	8.2%	9.0%	9.5%
21	6.9%	7.9%	8.7%	9.4%	9.9%
22	7.4%	8.4%	9.1%	9.9%	10.3%
23	8.0%	9.0%	9.7%	10.5%	10.7%
24	8.7%	9.6%	10.3%	11.1%	11.3%
25	9.5%	10.5%	11.1%	11.9%	11.9%
26	10.5%	11.4%	12.1%	12.8%	12.6%
27	11.7%	12.7%	13.2%	13.9%	13.6%
28	13.2%	14.2%	14.7%	15.4%	14.7%
29	15.2%	16.2%	16.6%	17.3%	16.1%
30	17.5%	17.5%	17.5%	17.5%	17.5%

A combination of inflation-adjusted annuity income and target drawdown percentage

The same as the above (*target drawdown percentage*), but with an additional rule that the annual adjustment in income will not exceed the inflation-adjusted annuity income target. The latter target is similar to the *inflation-adjusted annuity income* rule. Thus, an escalation in income may not exceed that income as determined by the inflation-adjusted annuity income rule. Furthermore, the same overriding provisions as above will apply.

Analysis

Next, let us examine how these different drawdown rules would have fared in a simulated scenario:

Assumptions:

I projected a thirty-year post-retirement lifespan. I assumed an inflation rate of 6% per annum (with a standard deviation of 1%). I assumed a relatively conservative investment portfolio with an expected net (after costs), real (excluding inflation) portfolio return of 3.5% per annum (with a standard deviation of 10%).

The table below exhibits the inflation rate and nominal (including inflation) portfolio returns for each year of the thirty-year post-retirement period used in the analysis. Note, these numbers are generated randomly, given the set of parameters I specified above.

Post-retirement Period	Inflation rate	Nominal portfolio return
1	6.3%	4.2%
2	6.7%	16.9%
3	7.0%	4.0%
4	5.0%	12.3%
5	6.6%	26.8%
6	6.8%	18.5%
7	4.4%	2.3%
8	7.0%	-14.3%
9	5.0%	2.6%
10	8.0%	-5.6%
11	7.3%	22.1%
12	7.0%	4.1%
13	4.5%	18.5%
14	5.2%	20.1%
15	6.1%	20.8%
16	5.5%	7.2%
17	4.8%	9.3%
18	6.0%	-1.4%
19	3.4%	0.8%

Post-retirement Period	Inflation rate	Nominal portfolio return
20	5.9%	22.4%
21	6.1%	4.5%
22	4.6%	19.3%
23	4.0%	19.5%
24	6.0%	20.5%
25	5.1%	13.3%
26	4.4%	30.1%
27	6.1%	6.5%
28	6.0%	13.8%
29	6.0%	2.9%
30	5.6%	5.1%

Furthermore, let us assume a person retires with R5m available as retirement capital. In the first year of retirement she needs an annual income of R250,000, thus an initial drawdown rate of 5% is required.

Objectives:

The living annuity retiree may have two potentially conflicting objectives, namely to ensure that the annual annuity income stays in line with inflation over time, and secondly, to preserve some retirement capital as a potential legacy for beneficiaries, described as legacy capital. The relative importance of each objective will differ among retirees as their personal financial circumstances will dictate.

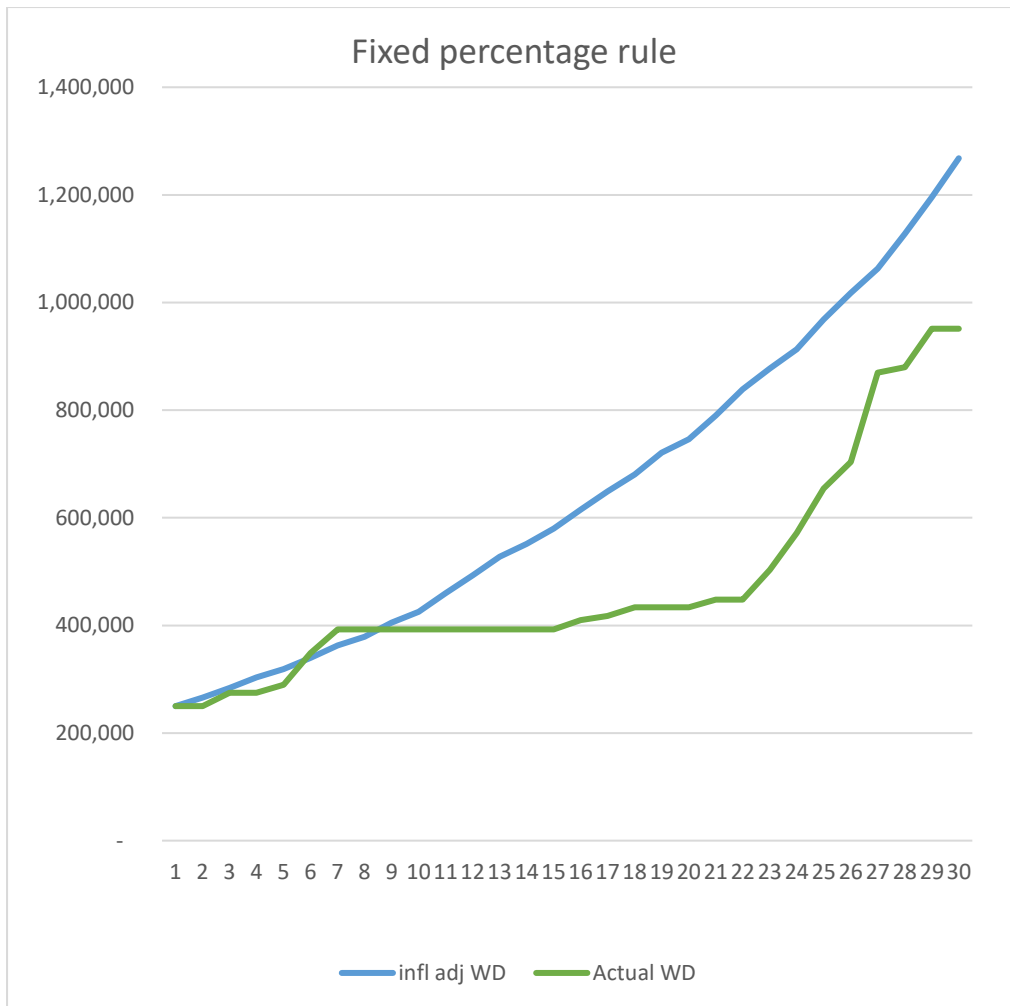
I evaluated both objectives separately; the amount of real (excluding inflation) annuity income yielded over time, and the legacy capital available at specific intervals during the post-retirement period, namely the 15th, 20th, 25th and the 30th year. Finally, given the total cash flow (annuity income yielded over the interval periods) and legacy capital available at every interval, I could calculate for each rule

its internal rate of return. Note, the general idea is not necessarily to identify the “best” drawdown rule for this scenario, but which rule served a specific objective (income and/or legacy capital) very well.

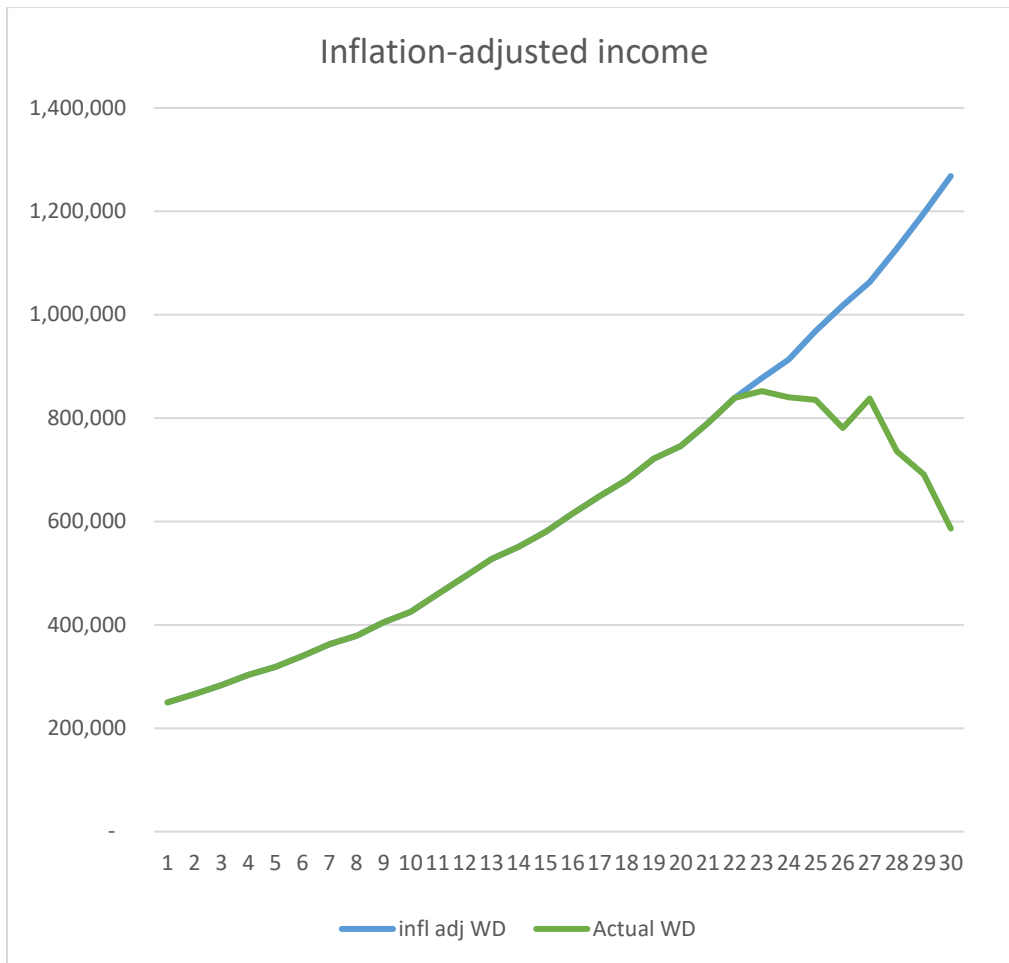
Inflation-adjusted annuity income objective:

Initial annuity income needs are escalated every year with the prevailing inflation rate and is the annuity income objective that a drawdown rule will target. Thus, it is like the *inflation-adjusted annuity income* rule, but no provisions apply, for example the 2.5% minimum or 17.5% maximum drawdown rate does not apply.

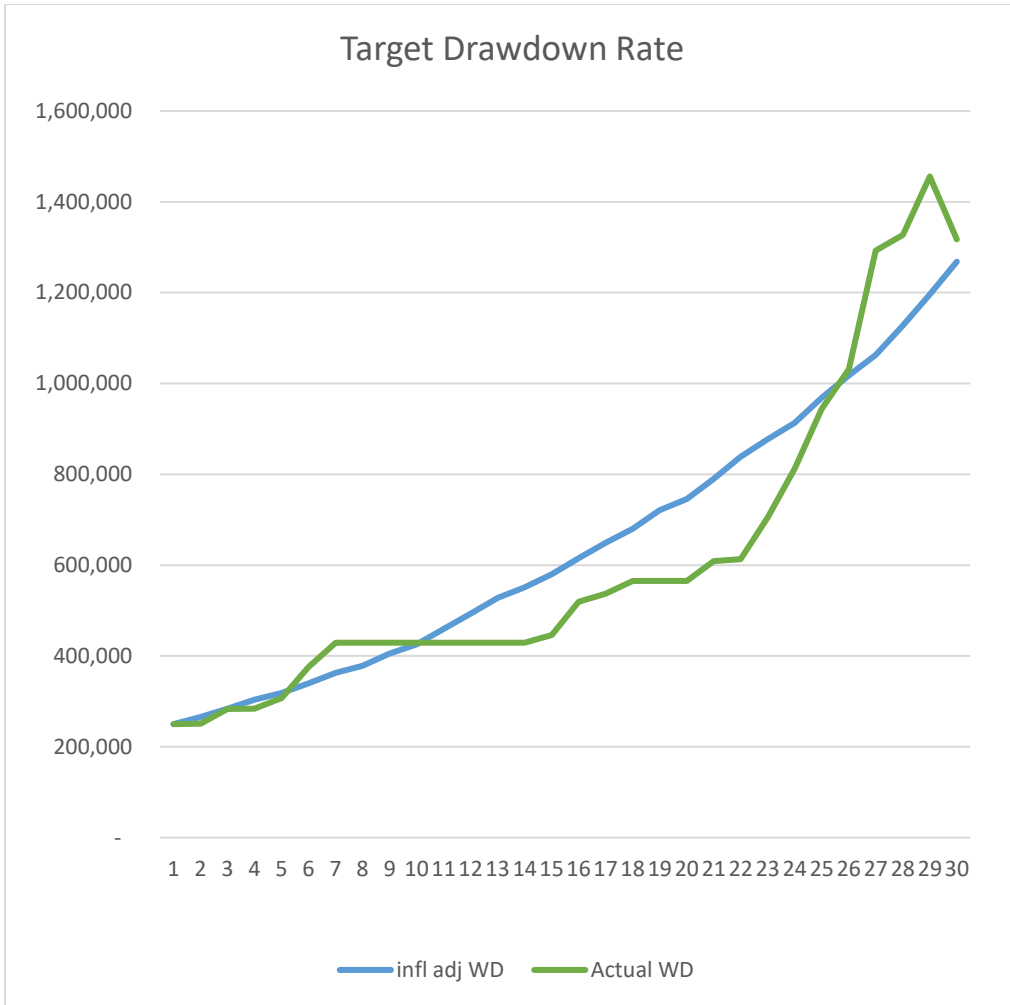
In the following graphs, each drawdown rule’s actual income over the lifespan of the post-retirement plan is benchmarked against the inflation-adjusted annuity income target. The latter target is depicted by a blue line and the actual annuity income by a green line.



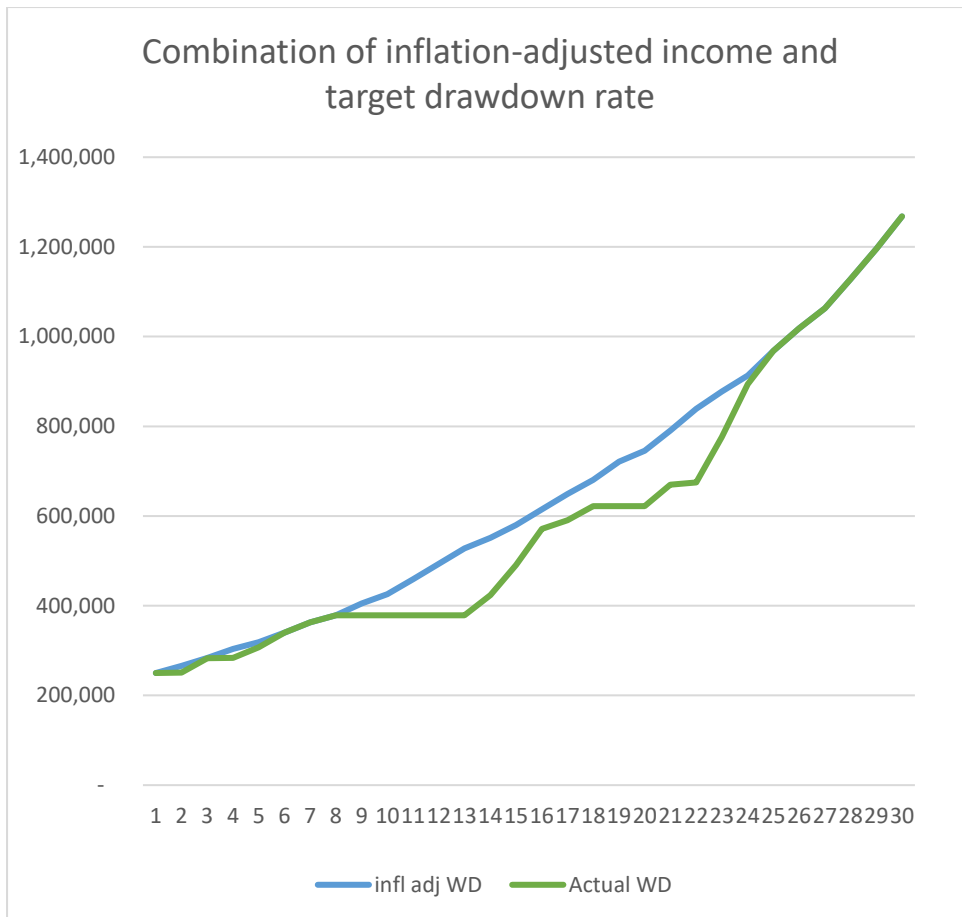
The actual annuity income stream broke down from the targeted inflation-adjusted income by the 10th year. Thereafter, it lost track with the targeted annuity income, but gradually recovered during the later stages of the post-retirement plan.



Until the 22nd year of post-retirement, the retirement plan could follow the targeted income objective, thereafter it lost track for the remainder of the term.



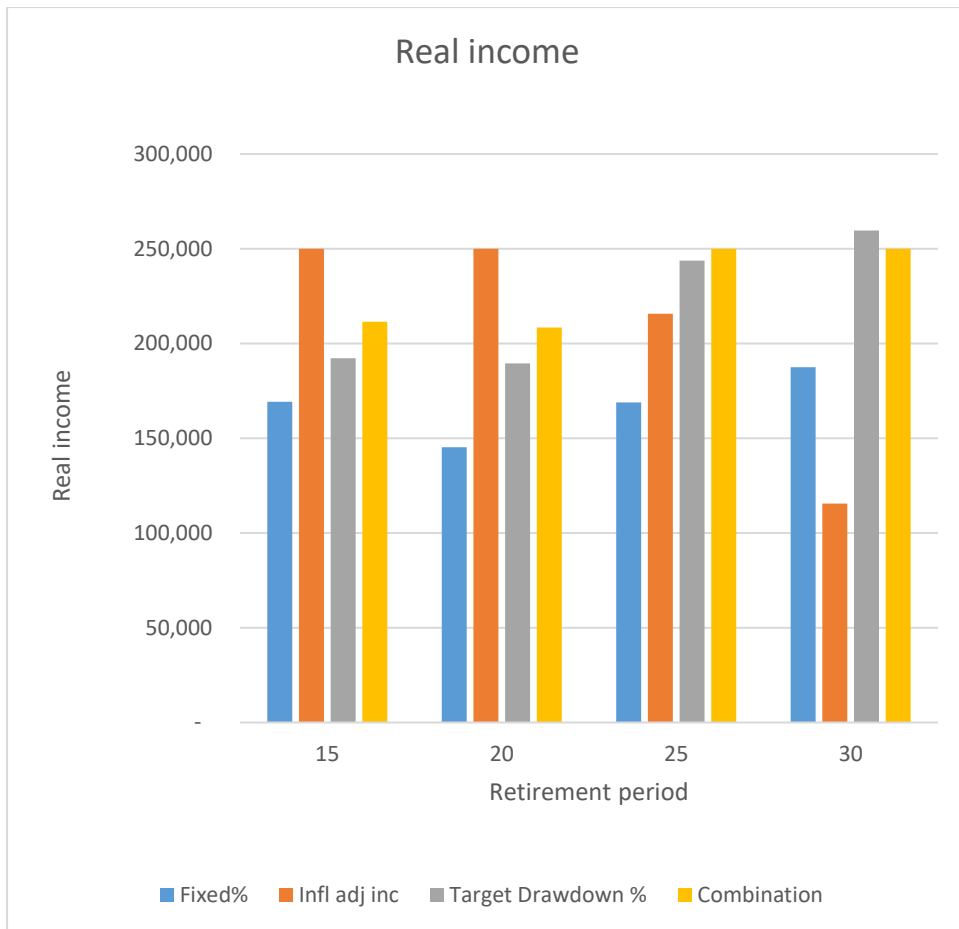
By the 10th year the retirement plan could not meet the targeted annuity income objective, but because of the rules applied, it could catch up and surpass the income target by the 26th year.



Again, the actual income from the plan broke from the targeted income objective by the 10th year, but never astray that far from the income target and caught up with it from the 24th year onwards.

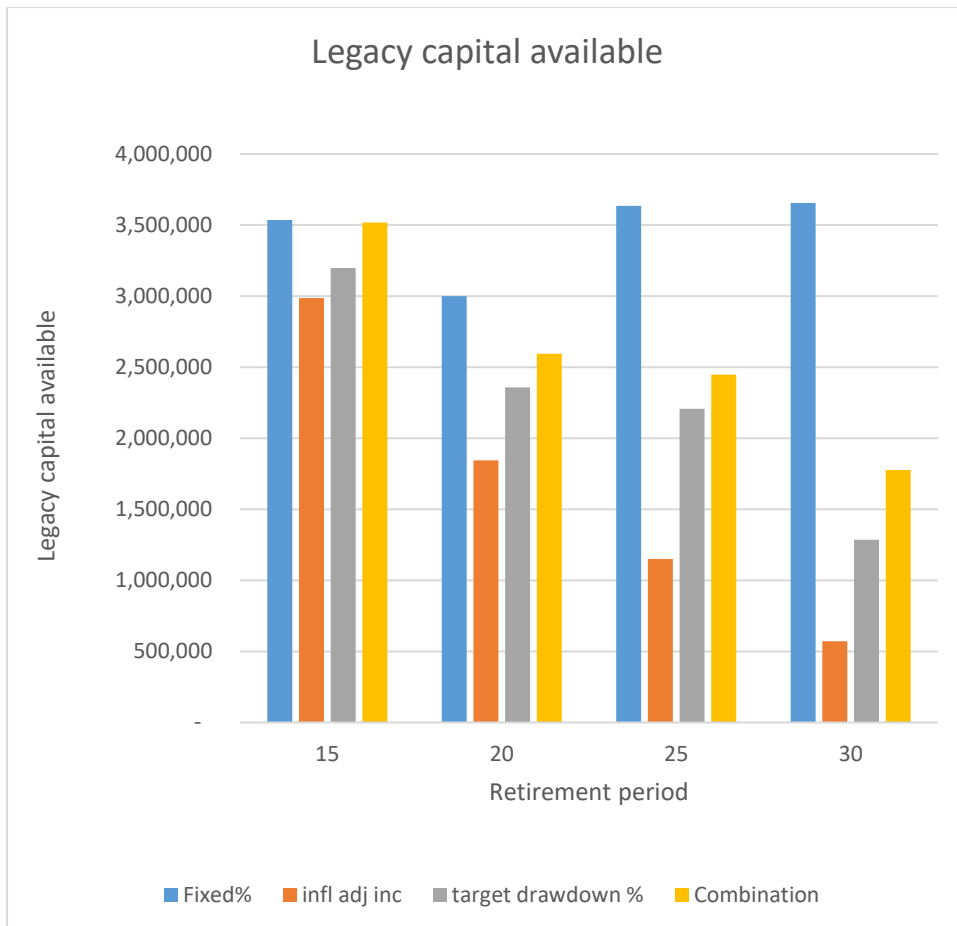
Thus, considering all four rules, it seems that the *inflation-adjusted annuity income* rule worked the best to track the retirement income target under this scenario, at least for the first 20 years, followed by the “*combination*” rule and *target drawdown rate* rule.

Alternatively, if one compared the real annuity income (actual annuity income discounted by the inflation rate) yielded by each rule at different intervals during the post-retirement period, the same results will surface.



Legacy capital objective:

The objective is to maximise the legacy capital available over time, but at the same time providing annuity income. The graph below depicts the outcome of each rule. I compared the legacy capital amounts available, discounted to present value, at different interval periods.



The *fixed percentage rule* yielded the highest legacy capital available across all interval periods in this scenario. But at the same time, it yielded the worst real annuity income, thus making such a rule for annuitants seeking to maximise their annuity income over time probably not suitable.

The “Best” Rule

The above findings demonstrate the trade-off between the annuity income and legacy capital objectives. As stated earlier, each retiree’s financial situation is different, therefore it is difficult to claim one rule superior to another. Nonetheless, if one compares the rules on a “holistic” basis, considering both annuity income over time and legacy capital, the *internal rate of return* for each rule at specific post-retirement intervals could be calculated. The results are shown below.

Post-retirement period	15	20	25	30
Fixed percentage rule	8.8%	8.5%	9.1%	9.3%
Inflation-adjusted income	8.6%	8.3%	8.5%	8.6%
Target drawdown percentage	8.7%	8.4%	8.8%	9.0%
Combination	8.8%	8.4%	8.9%	9.0%

The *fixed percentage* rule edged out the other rules in this specific scenario, especially over the longer-term periods, but such a rule may not have been suitable for many retirees as the annuity income did not keep track with inflation or rising income needs over time. The *target drawdown* and the *combination* thereof with the *inflation-adjusted income* rule would have provided better solutions in this scenario.

To be continued...

In follow-up articles, I will consider the same drawdown rules under different initial income withdrawal needs and a multitude of return simulations, which may result in different outcomes to this analysis. Thereby it is possible to stress-test each rule under different circumstances.