Improving retirees' withdrawal symptoms

A rule for durable decumulation

Are savers taking their pension's pulse regularly enough? We examine a health check that we believe can help investors spend sustainably.

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What, when, and how much? For savers entering income drawdown in retirement, the key questions are not only how they should invest, but also how quickly they should withdraw.

In an earlier article, we considered the 4% rule for withdrawals. We found that while it offers simplicity, unfortunately for investors, life is much more complicated.

So, if the 4% rule isn't up to scratch, is there a simple approach we can use instead? This article explores the drawdown and investment strategies that may help retirees seeking to maximise a sustainable withdrawal rate.

Retiring is a risky business

To work out how quickly to withdraw, investors need to understand the risks associated with spending too quickly (and running out of money) or spending too slowly and ending up with a large amount of unspent cash. Understanding the risks involved is complicated, as investors face both investment risk (i.e. the risk that assets perform worse than expected) and longevity risk (i.e. the risk they live for longer than expected). These risks depend on the investment strategy followed and the age and health of the investor. Longevity risk is important for investors in retirement and our research indicates that a typical income drawdown investor entering retirement faces similar levels of longevity risk to investment risk, and that its importance increases with age.

Finding your level

Intuitively, some people may want to 'set and forget', finding a fixed level to withdraw retirement income at for life, but this may not be a sensible solution.

Instead, we believe investors may well want to increase their spending following a good investment experience and reduce it following poor performance. They may also think about reducing their spending rate if their health fares better than expected.

There are various factors at play that could influence how much savers withdraw at a given point in time:

1. Future life expectancy. The longer this is, the smaller the percentage of the remaining funds an investor will be inclined to spend

2. Investment strategy. This depends on an investor's appetite for risk. Higher withdrawal rates will be associated with more aggressive investment strategies

3. The level of (real) interest rates. The extent to which interest rates matter is an interesting question. There are two competing drivers at play:

    - Higher interest rates make higher withdrawals more affordable (because expected returns are higher), but

    - Higher interest rates also encourage greater saving versus spending now.

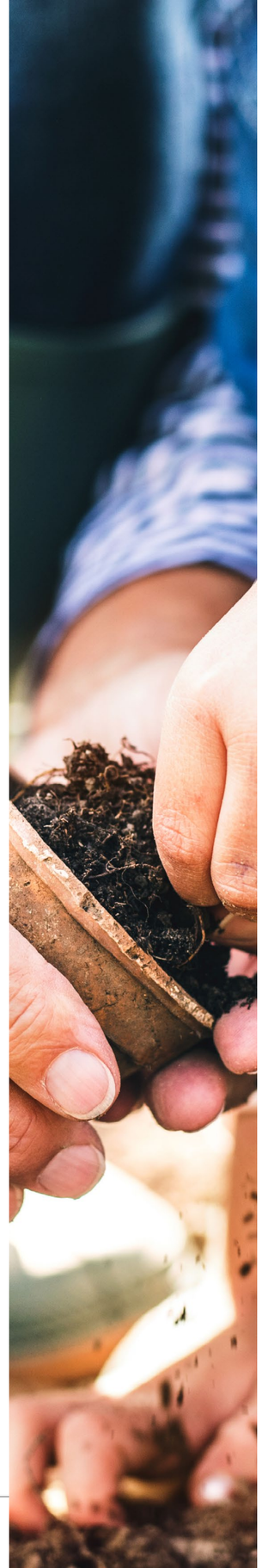
    To a large extent these factors offset each other, when it comes to deciding what percentage of the remaining pot to spend each year. To read more on this you can check out our blog here

4. Defined benefit (DB) income. If there is a significant source of DB income, such as from an occupational pension scheme, then splurging is less consequential. In this article we ignore DB income to encourage well-paced spending[1] (investors with large DB incomes need not be so concerned with our rule of thumb).

To establish a rule to maximise happiness versus spending in retirement, we test different withdrawal strategies in a model that simulates investor outcomes (allowing for investment and longevity risk) and find out what works best.

A strategy that draws down a percentage of the remaining pot, where the percentage depends on age, makes the most sense. The withdrawal amount will then depend on the current pot size. If, for example, investment performance is very positive during retirement, savers can increase their withdrawals and make the most of their good fortune. The withdrawal strategy will also respond to future life expectancy and longevity risk, which will help the investor pace their spending appropriately in response to living for longer than expected, for example[2].

[1] Under our framework, allowing for DB income doesn't actually have much impact on the optimal withdrawal strategy unless the investment strategy is also changed. This is because our approach assesses appetite for risk in the withdrawal strategy to be consistent with marginal appetite for risk as implied by the choice of investments.



The pursuit of welfare

To calculate what we think are sensible withdrawal rates we developed a model with the features shown in Figure 1.

Feature	Comments
1) Allows for both investment and longevity risk.	Simulates both investment and longevity experience at the same time.
2) Allows for the need to smooth consumption.	Captured by using a measure of success we call 'welfare'.
3) Links the withdrawal decision to the investment strategy decision.	Investors with a greater appetite for risk will have both a more aggressive strategy and a higher withdrawal rate.
4) Allows for the investor's changing circumstances.	The pot may have grown by more or less than expected or the investor may have lived for longer than expected.
5) Captures likely future decisions in making today's decision.	It's important to only make assumptions concerning future actions that the investor is likely to follow through on[3].

Figure 1: Key features of our withdrawal model.

Modelling details are given in Appendix A for interested readers. Here we just give a brief summary of a key feature of our approach – namely our 'welfare' metric for retirement success.

We define this as the average (and inflation-adjusted) income received in retirement. But rather than take a regular 'arithmetic' average (the one you are probably most familiar with) we take what's called a 'geometric' average of these yearly amounts[4]. A simple example where the investor only lives for two years in retirement is shown below. The arithmetic average income is the same in both cases (namely £10,000), but welfare is lower in the second case:

Case	Income in Year 1	Income in Year 2	Welfare
1	£10,000	£10,000	√(£10,000 ×£10,000) = £10,000
2	£15,000	£5,000	√(£15,000 ×£5,000) = £8,660

Examples are provided for illustrative purposes only.

[2] Interest rates and DB pension income don't affect our rule of thumb but do impact retirement outcomes.

[3] For example, if you make an assumption at age 65 that you will withdraw in a way that you are unlikely to follow in practice, such as taking £10,000 each year regardless of experience, this could give misleading results.

[4] This simply involves multiplying the incomes from each year and taking the N^{th} root, rather than adding them all up and dividing by N.

Essentially 'welfare' is higher when consumption levels are higher or consumption is spread more smoothly over time. If investors spend too slowly then their welfare will be lower than it needs to be because the level of consumption is too low. But if they spend too fast then although there will be little risk of not using all their savings during their lifetime, their consumption could be very front-loaded and welfare will be low or zero in some cases.

A rule of thumb for lasting income

There is more to our model than this metric, but following the approach (outlined in Appendix A), and making some sensible assumptions regarding investment strategy (given in Appendix B), our rule of thumb can be captured in a table. This is shown in Figure 2 at five yearly points.

Figure 2: Our rule of thumb for what percentage of the remaining pot to spend

Age	Percentage of remaining pot to spend each year	Expected[5] incomes for an initial pot of £100,000 (if investor survives to that age)	Range of incomes[6] for an initial pot of £100,000 (if investor survives to that age)
100+	22.5%	£1,700	£900-£3,300
95	20.3%	£3,800	£2,100-£7,200
90	15.3%	£5,600	£3,100-£9,400
85	11.2%	£6,000	£3,600-£9,600
80	8.6%	£5,900	£3,800-£8,800
75	7.1%	£5,600	£3,900-£7,800
70	5.9%	£5,300	£4,100-£6,600
65	5.2%	£5,200	£5,200-£5,200

Source: LGIM calculations as at 31 March 2020. Examples are provided for illustrative purposes only.

For example, we'd expect a pot that started at £100,000 when a saver is aged 65, to be worth around £69,000 by the time an investor is aged 80, if the rule of thumb is followed and assets are invested in a strategy similar to that described in Appendix B. The withdrawal amount for that year is then expected (in the median case) to be around 8.6% of £69,000; i.e. £5,900 for that year. However as the strategy is risky there is a range of possible pot sizes and resulting withdrawals: indeed we would only be 80% confident this would be in the range of £3,800 to £8,800 as shown in the last column of Figure 2.

Tread carefully

Of course caution is important – retirement outcome risk is not the only factor to consider, and the investor may have other objectives, such as leaving an inheritance. Individual needs, circumstances and risk appetite matter greatly and may not be constant over time. A one-size-fits-all approach is not possible when investors have specific health issues, tax situations and spending goals.

[5] Median
[6] 10th and 90th percentiles

As such, the rule of thumb in Figure 2 should only be seen as one potential benchmark or loose guide, albeit one that may do better than the simple 4% rule, in our view. For example, it could make perfect sense to deviate from it due to emergencies or because of a deliberate plan to spend unevenly during retirement in response to changing healthcare needs, or perhaps to reflect a shifting appetite for recreational activities. It may well also be sensible to annuitise in old age. One also needs to keep an eye on the appropriateness of the assumptions made, such as mortality rates. However, we believe that our rule of thumb, combined with a suitably diversified strategy, could form a useful starting point for decision-making.

Our article has focused on how a possible guide to how investors should spend, rather than on how they might actually spend due to behavioural factors. Stay tuned though - we plan to explore this in a future article.

Appendix A: Modelling details

Features (1)-(5) of Figure 1 are captured in the following ways:

(1) We use a stochastic model that simulates both investment returns and how long the investor lives (by treating mortality rate for each year in retirement as the chance of dying in that year). This allows us to understand the influence of both these risks in a unified way.

(2) The need to smooth consumption is captured by using our 'welfare' metric, as described in the main text. The formula for this if the investor lives for N years in retirement is:

Welfare = $(\text{Income}(1) \times \ldots \times \text{Income}(N))^{1/N}$ where Income(t) is the inflation-adjusted income taken in year t.

(3) For each potential withdrawal strategy we calculate a distribution of welfare outcomes by looking at the welfare outcome across thousands of different scenarios. Some of these withdrawal strategies will lead to a low but reliable level of welfare across simulations. Others will give a higher on average but less reliable level of welfare. The right trade-off depends on the investor's appetite for risk. We implied their appetite for risk from their assumed choice to invest in the income-drawdown fund described in Appendix B.

(4) Two key factors affecting the decision to withdraw are the size of the pot (larger pots support proportionately larger withdrawals) and the age of the investor (older people can withdraw a higher percentage of their remaining pot given a shorter future life expectancy). The model generates a rule where withdrawals scale with the current pot size and increase in percentage terms with age.

(5) The way we calculated the percentage of the pot to spend at each age was by working backwards from old age. We started at a very high age (100) and worked out the ideal withdrawal percentage according to our model if you were that old . We then stepped back one year and repeated the exercise but made use of the fact that we know the withdrawal strategy to follow for ages 100+, so only actually needed to optimise for the withdrawal at age 99. By repeating this process we worked out what the withdrawal percentage should be at every age.

On (3), note that welfare is a good measure of success for a particular scenario, but to understand how good a withdrawal strategy is we need to look at the distribution of welfare over thousands of scenarios. For some withdrawal strategies these distributions will be unattractive because withdrawals were too quick and others because withdrawals were too slow. To find the sweet spot, we formulated a measure called "risk-adjusted welfare" that summarises how attractive the distribution is. We picked the risk-reward trade-off in this risk-adjusted measure (i.e. how much it punishes uncertainty) to be consistent with a choice by the investor to invest their pot in an income drawdown fund. This is somewhat technical and uses power utility functions; please do contact us if you would like further details on this or any other aspects of this model.

[7] Assuming withdrawal percentages remain flat after that age

Appendix B: Assumed investment strategy and longevity characteristics

Fund	Risk premium[8] allowing for alpha and fees (p.a.)	Volatility (p.a.) over 1 year
Multi-asset income drawdown	2.8%	8.0%

Mortality rates adopted are in line with ONS male period 2012 based life table mortality rates (qx), 1981-2062.

[8] Expected geometric risk premium

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