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The UK replacement ratio: Making it personal

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- A replacement ratio is a rule of thumb that estimates what percentage of a person's pre-retirement income will be needed to maintain their lifestyle at retirement.
- Many studies tailored to the UK retirement landscape state that target replacement ratios can range from 50-80% of pre-retirement income. While these studies use replacement rates to estimate what would broadly maintain living standards at respective income levels, we aim to provide a process that can deliver a solution for each individual.
- With our approach to calculating the replacement ratio, investors begin with their current annual consumption and then factor in the taxes and other charges necessary to access their savings. The replacement ratio is then the total amount required in retirement, expressed as a percentage of the investor's pre-retirement income. It can be determined with or without taxes.
- Because people – and thus their retirement goals – are unique, investors that otherwise seem similar can have very different replacement ratios. Variables affecting the desired ratio include broad demographic differences (income and personal savings, for example) as well as more subtle, personalised influences (home ownership and pension pot distribution options, for example).

In a sense, retirement planning can be summarised as a process of asking and answering three questions: how much, how soon and how feasible? While all three are crucial in developing a retirement plan, this paper focuses on the question of how much an individual is likely to need to maintain their unique lifestyle in retirement. Understanding how much will be spent during retirement is essential, but many investors are unable to calculate a specific post-retirement budget until they are within a few years of hitting this milestone. Financial advisers with a feel for how much of their income their clients may need to replace at retirement are better able to address the questions of how much to save, how long to work and how much market risk to take.

This paper starts by explaining how the replacement ratio works as a rule of thumb in retirement planning and highlights our top-down approach to the calculation. The second section provides a breakdown of initial replacement rates that can be used by various households, as well as a summary of how basic household characteristics and tax assumptions influence the target. We conclude with an overview of personal factors that advisers should consider when tailoring the replacement ratio for specific investor situations, and identify how these personal considerations will move the needle for the target replacement ratio.

Many investors working towards retirement rely on a replacement ratio as a stand-in for a specific spending level when developing a retirement plan. While the term replacement ratio has taken on different meanings in different studies[1], here we define it as the percentage of pre-retirement income required to maintain a current lifestyle upon the transition to retirement. To avoid using an artificially low income level associated with part-time employment[2], investors should consider the point of retirement to be the transition from full-time employment and not the point when they exit the workforce completely.

Using this definition, we are then able to identify the key components of the replacement ratio as shown in Figure 1.

Figure 1: Key components of the replacement ratio*

Spending	Ongoing spending: includes both basic and discretionary spending
Cost of access	Taxes **and any other charges** associated with income and assets used to support ongoing spending

***Note:** Given the low overall adoption rate of private medical insurance in the UK and the varying costs associated with out-of-pocket expenditures, the initial replacement ratios do not include an assumption for the costs of care. Investors should consider how their personal situation and preference for private cover would impact their replacement ratio on a case-by-case basis.

Although they are necessary inputs for determining the likelihood of successfully funding retirement, *contingencies and legacies* are outside the scope of our analysis. The replacement ratio as we have defined it here aims to address only basic and discretionary spending that is expected to be regular and recurring in nature (Jaconetti et al., 2018).

The importance of the replacement ratio

How to determine the appropriate replacement ratio

Developing the target replacement ratio is a two-step process, as shown in Figure 2. The first step is to determine how much of today's income is used for ongoing spending needs. A simple formula can be used to determine this: *gross income – taxes – savings = amount available for spending* (MacDonald and Moore, 2011)[3]. This approach puts the emphasis on the overall amount of money spent, rather than what it is spent on.

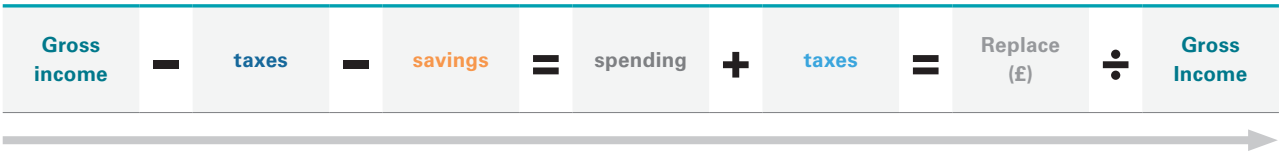
The second step adjusts the spending level to account for the impact of lifestyle changes that come with retirement. These include anticipated changes in spending patterns – paying off a mortgage during retirement or helping loved ones with temporary support – as well as changes in how one chooses to spend one's time and money. These adjustments are by nature idiosyncratic but most households will need at least to account for the impact that changes in their income taxes can have on their actual spending level (and their replacement need).

1 Some studies have used the term to refer to how much income will be available from various sources at retirement, while others have used it to refer to the amount required from private sources to maintain a level of spending.

2 According to a 2013 DWP study, 66% of all workers age 65+ are employed in a part-time capacity.

3 Debt accrual or liquidation of savings would result in a positive value for savings in the formula. Employer contributions to defined contribution or defined benefit plans should NOT be included.

Figure 2: The replacement ratio equation



Note: The first round of 'taxes' shown includes income tax and National Insurance contributions, while the second round of 'taxes' accounts for income tax on pension pot distributions and new State Pension income only.

It is important to note that the replacement ratio is a key input an investor uses to create a retirement plan. It is not necessarily a measure of what is possible. While the plan should help the investor make informed decisions that could help them reach their target, there is no guarantee that it will do so. An investor may need to consider increasing savings, reducing spending upon retiring, or delaying the goal – all of which could cause the replacement ratio to change.

A higher hurdle to clear

In 2004, the Pensions Commission released the first of three reports on pension adequacy for current and future retirees in the United Kingdom. Along with a series of policy recommendations, this report established benchmark replacement ratios based on various income levels. These replacement rates – ranging from 80% for the lowest income earners, 67% for median income earners and 50% for the highest income earners – have since become seminal findings for subsequent retirement adequacy studies in the United Kingdom.

In the report, replacement rates were used as a benchmark for various income levels, which were measured as *pre-tax pension income (defined as state pension, private pension and means-tested benefits) in the first year of retirement divided by pre-tax earnings in the last year of work* (Pensions Commission Appendices, 2004). This approach provides a broad measure of income assumed to be available to retirees through public and private sources, **but not necessarily an estimate of what any specific individual spends before moving into retirement**. In contrast, the approach taken in this study aims to estimate what percentage of pre-retirement income an individual might need to maintain their pre-retirement lifestyle, **but is itself not a measure of what can successfully be replaced through outside income and personal savings**.

This creates some cause for concern with respect to the ability of workers to retire at their projected personal standard of living. Some individuals will grow accustomed to a lifestyle well above the benchmark replacement rates developed by the Pensions Commission and subsequent studies. What's more, recent research has shown that the vast majority of workers are likely to fall short of even the more modest targets set by the Pensions Commission (Resolution Foundation, 2017). This could lead to an individual severely compromising their lifestyle at the onset of retirement, as outside sources of income and personal savings might not be sufficient to sustain their accustomed lifestyle.

Investors and advisers alike should compare how an initial replacement ratio might differ from the traditional benchmarks established from prior research, and whether it can be maintained alongside a more aggressive spending target. To the best of their ability, investors should consider how their lifestyle is likely to change later in life, as the impacts of eliminated debts, lifestyle preferences, etc., could explain much of the gap between the outcomes of these two approaches.

The initial replacement ratio: a good start

In **Figures 3a and 3b**, we show the initial replacement ratios across different income levels and savings rates in two forms: as a tax-exclusive (net) or tax-inclusive (gross) value. These values provide an estimate of what percentage of their income an individual would need to maintain their lifestyle if they were to retire in the following year. The first column shows various pre-retirement income levels, with subsequent columns showing the percentage of that income that needs to be replaced to maintain spending levels at four different pre-retirement savings rates, expressed as a proportion of income.

When determining a client's retirement need, advisers should understand whether their calculations are based on a net or gross replacement assumption. Figure 3a (left) provides replacement ratios that take account of both savings rates *and* taxes before and after retirement; the replacement ratios in Figure 3b (right) only take account of savings rates.

Figure 3a (left): Net replacement ratios (tax-exclusive) by household income and savings
Figure 3b (right): Gross replacement ratios (tax-inclusive) by household income and savings

Net replacement ratio

	Pre-retirement savings rate			
Pre-retirement income	5%	10%	15%	20%
£ 12,500	94%	89%	84%	79%
25,000	80	76	72	68
37,500	75	71	67	63
50,000	73	69	65	61
62,500	70	67	64	61
75,000	68	65	62	59
87,500	66	63	60	57
100,000	65	62	59	56

Gross replacement ratio

	Pre-retirement savings rate			
Pre-retirement income	5%	10%	15%	20%
£ 12,500	94%	89%	84%	79%
25,000	85	80	75	70
37,500	82	77	72	68
50,000	81	76	71	66
62,500	79	75	72	68
75,000	77	73	69	66
87,500	75	72	68	64
100,000	76	72	67	63

Notes: Assumes investors reside in England, Wales or Northern Ireland. All savings are assumed to be pre-tax up to the Annual Allowance; all excess savings are made in an individual savings account (ISA) until annual limits are met, with the remaining savings placed in a general investment account (GIA). No use of the pension contributions annual allowance carry-forward is assumed. Initial replacement ratios assume the investor remains under the pensions lifetime allowance limit, currently set to £1,073,100. Other assumptions: investor either rents or has paid off their mortgage and reallocated 100% of mortgage payments to other ongoing expenses.

With respect to the United Kingdom retirement landscape, our research found that there are three main drivers of the initial replacement ratio: income, savings rates and one's region of residence[4].

Income: Similar to the findings of the Pensions Commission, our study finds that lower-income households need to maintain a higher percentage of pre-retirement income to sustain ongoing spending needs than do higher-income cohorts. This is in part because lower-income households owe less income tax while working, and therefore do not realise the tax savings in retirement that higher earners do.

Savings rates: Our approach assumes that, during the accumulation period, taxes and savings are paid or funded first, and whatever is left is spent; therefore, a higher savings rate results in less income available for current spending (and vice versa). All things being equal, a higher savings rate results in a lower replacement ratio.

One additional wrinkle that investors must consider is the impact of the pension lifetime allowance (£1.07 million in 2020/21) on their savings strategy. While only a handful of investors currently exceed the threshold, a recent study estimated that up to 1.25 million non-retired adults could exceed the lifetime allowance by retirement (Royal London, 2019). Of those, workers in the £60,000 to £90,000 range are most likely to be ensnared by the lifetime allowance, as the highest income workers are heavily limited in the contributions they can make to their pre-tax pension pot[5].

Those who exceed the lifetime allowance could find themselves subject to additional taxes in the form of a lifetime allowance charge during retirement[6]. Investors who wish to avoid this charge may choose to accelerate their income in the early days of retirement (depleting the account before it breaches the lifetime allowance) or alter their pre-retirement savings habits to direct more money towards after-tax savings, either in an individual savings account (ISA) or general account. Regardless of

4 One could include marital status here, as the presence of a spouse allows for both economies of scale with respect to spending and the opportunity for additional tax planning strategies. However, these tax planning strategies are not applicable to all married couples and the benefit could vary across households with identical income and savings rates.

5 Source: 'Pension Lifetime Allowance Breach May Impact More Than a Million Workers.' Armstrong Watson. Retrieved on 11 September 2019. Available at: https://www.armstrongwatson.co.uk/news/2019/08/pension-lifetime-allowance-breach-may-impact-more-million-workers.

6 A lifetime allowance charge is levied on all crystallised pension benefits above the lifetime allowance, £1.07 million in 2020/21. This charge is equal to 25% of the crystallised benefits that exceed the allowance and is in addition to any income tax owed when the amount is taken as income.

how investors approach this issue, their replacement ratio will be impacted. Investors who choose to pay the lifetime allowance charge or who choose to accelerate crystallisation will have a higher replacement ratio due to the higher cost of accessing funds in retirement. Those who choose to attempt to avoid breaching the lifetime allowance charge by increasing their after-tax savings will have a lower replacement ratio due to both lower taxes in retirement and higher taxes pre-retirement.

Region: While England, Wales and Northern Ireland all use similar tax brackets and rates for income taxes, Scotland incorporates slightly different thresholds and rates[7]. Higher earners are thereby subjected to slightly higher income taxes while working; this results in less income available for spending, which reduces the replacement ratio.

Relative to income and savings rates, the region of residence has a de minimus impact on the initial replacement ratio[8]. In all, no income level was impacted by more than 3 percentage points as a result of the region where they resided. When compared to our findings for other regions, Scottish residents experienced a 1 percentage-point reduction in the replacement ratio at the £50,000 level, a 3 percentage-point reduction at the £62,500 and £75,000 level, and a 1 percentage-point reduction for all other higher levels.

An example of the two-step process to replacement ratios

To the right is an example of our framework applied to a 65-year old individual earning £25,000 per year and saving 10% on a pre-tax basis. In addition to income taxes, out of every wage or salary payment they receive, a portion is withheld for National Insurance[9]. After all savings and tax withholdings, this person has £18,640 available for spending throughout the year.

Once they have retired, their goal is to maintain the same lifestyle as the year before. To determine how much income they would need, they would take into account the impact of inflation on their spending, consider the impact of lifestyle changes or new expenses (such as private medical insurance), and include the impact of taxes when distributing from their various retirement accounts. Assuming no lifestyle changes or private medical insurance (PMI) premiums, this person will require almost £20,000 from their new State Pension[10] and distributions from retirement accounts to maintain their lifestyle in year one of retirement. Put another way: £19,963 in year one of retirement will buy the same quality of life that £25,000 did the year before.

Assumptions

Age: 65 years old, retiring at State Pension age
Marital status: single
Individual income: £25,000
Personal savings rate: 10% of income, all pre-tax

Working: final year

£25,000 gross income
– £1,860 National Insurance premiums
– 2,000 income taxes
– 2,500 savings
= £18,640 available for spending

Retirement: first year

£18,640 last year's spending
+ £373 cost of living
+ 0 lifestyle changes or PMI premiums
+ 950 income taxes
= £19,963 needed to maintain spending

£19,963 / £25,000 = 79.9% replacement ratio

Sources: Vanguard calculations, using 2020 tax rates, brackets, allowances and thresholds for final year of work. Assumes investor was eligible for full new State Pension of £9,110, with remaining need coming from pension pot distributions. Pension pot distributions were assumed to be 75% taxable and 25% tax-exempt. Assumes investor was eligible for full new State Pension of £9,110, with remaining need coming from pension pot distributions. Pension pot distributions were assumed to be 75% taxable and 25% tax-exempt.

7 While England, Wales, and Northern Ireland use three brackets (basic rate at 20%, higher rate at 40%, and additional rate at 45%), Scotland uses five brackets (starter rate at 19%, Scottish basic rate at 20%, intermediate rate at 21%, higher rate at 41%, and top rate at 46%). In Scotland, the higher rate tax bracket begins after £43,430 of income rather than the £50,000 threshold applied in the other three regions.

8 This is not to say that costs of living are similar across cities and regions, as areas like London and Cambridge tend to be more costly than Glasgow and Belfast. However, if workers aim to replace their personal level of consumption at retirement, then the personal ratio does not change much. A pound just might go further in lower-cost areas than higher-cost ones.

9 Most workers will be classified as National Insurance Class 1, for which the following 2020-21 rates and levels for National Insurance premiums apply: nothing on the first £183 of weekly income, then 12% on the next £962 of weekly income, then 2% on all earnings thereafter.

10 This assumes all applicable retirees are currently one year from their age of pension entitlement and plan to retire upon reaching the age of entitlement.

New State Pension and its role in the replacement ratio

When looking at the replacement ratio, it is important to keep in mind that not all of the need has to be funded by one's savings alone. Almost all retirees will receive some form of support from the new State Pension and/or a defined benefit pension plan at retirement, which can help reduce the savings burden of covering the entirety of one's replacement goal[11].

A retiree who qualifies for the full new State Pension would be entitled to a weekly payment of £175.20 (£9,110 for the 2020/2021 year), regardless of their pre-retirement income. The income-agnostic structure of the new State Pension means that benefits cover a greater percentage of pre-retirement income for lower-income households, with relative support diminishing as income increases. For example, a retiree who earned the equivalent of £25,000 per year and saved 5% might have 43% of their replacement need covered by the new State Pension (shown in **Figure 4b**), while the same payment would only support 23% of the replacement need for an otherwise-similar person earning £50,000.

After determining the initial replacement ratio and accounting for the amount of support available from outside sources, the investor will arrive at their funding level: the amount of their first-year retirement need that must be replaced from personal savings. In traditional retirement calculations, this funding level is the amount that investors and advisers aim to predict when determining their progress towards their retirement goal.

While the difference in overall replacement ratios might not differ greatly between individuals of slightly higher means, the percentage that must be covered through personal savings can be dramatically different. This is a direct result of the amount of support offered from outside sources such as the new State Pension. In our example, the difference in the replacement ratio for an individual making £25,000 and £50,000 per year is only 4 percentage points at the 5% savings level (**Figure 4a**); however, *in terms of the portion of pre-retirement income that must be replaced through personal savings*, the difference jumps to 16 percentage points (**Figure 4c**).

Figure 4a (left): Gross replacement ratios, from Figure 3b
Figure 4b (right): Percent of gross replacement ratio covered by the new State Pension
Figure 4c (bottom): Percent of pre-retirement income required from personal savings

Replacement ratio (gross)

	Pre-retirement savings rate			
Pre-retirement income	5%	10%	15%	20%
£ 12,500	94%	89%	84%	79%
25,000	85	80	75	70
37,500	82	77	72	68
50,000	81	76	71	66
62,500	79	75	72	68
75,000	77	73	69	66
87,500	75	72	68	64
100,000	76	72	67	63

Support from new State Pension

	Pre-retirement savings rate			
Pre-retirement income	5%	10%	15%	20%
£ 12,500	78%	82%	87%	93%
25,000	43	46	49	52
37,500	30	31	34	36
50,000	23	24	26	27
62,500	19	19	20	21
75,000	16	17	18	18
87,500	14	15	15	16
100,000	12	13	14	14

Required from personal savings

	Pre-retirement savings rate			
Pre-retirement income	5%	10%	15%	20%
£ 12,500	16%	7%	-3%	-14%
25,000	42	34	27	18
37,500	52	46	39	32
50,000	58	52	45	39
62,500	60	56	51	46
75,000	61	56	52	47
87,500	62	57	53	48
100,000	64	59	54	49

Notes: Assumes 35 years of new State Pension credits by the current State Pension age. Assumes all individuals receive £9,110 in annual benefits from the new State Pension. The assumed retirement age of 66 is a baseline assumption and is not intended to be a recommendation for the ideal retirement age in any specific situation. **Figure 4c** subtracts the amount of support from the new State Pension shown in **Figure 4b** from the initial gross replacement ratio in **Figure 4a**. A negative figure shows a surplus from the state pension.

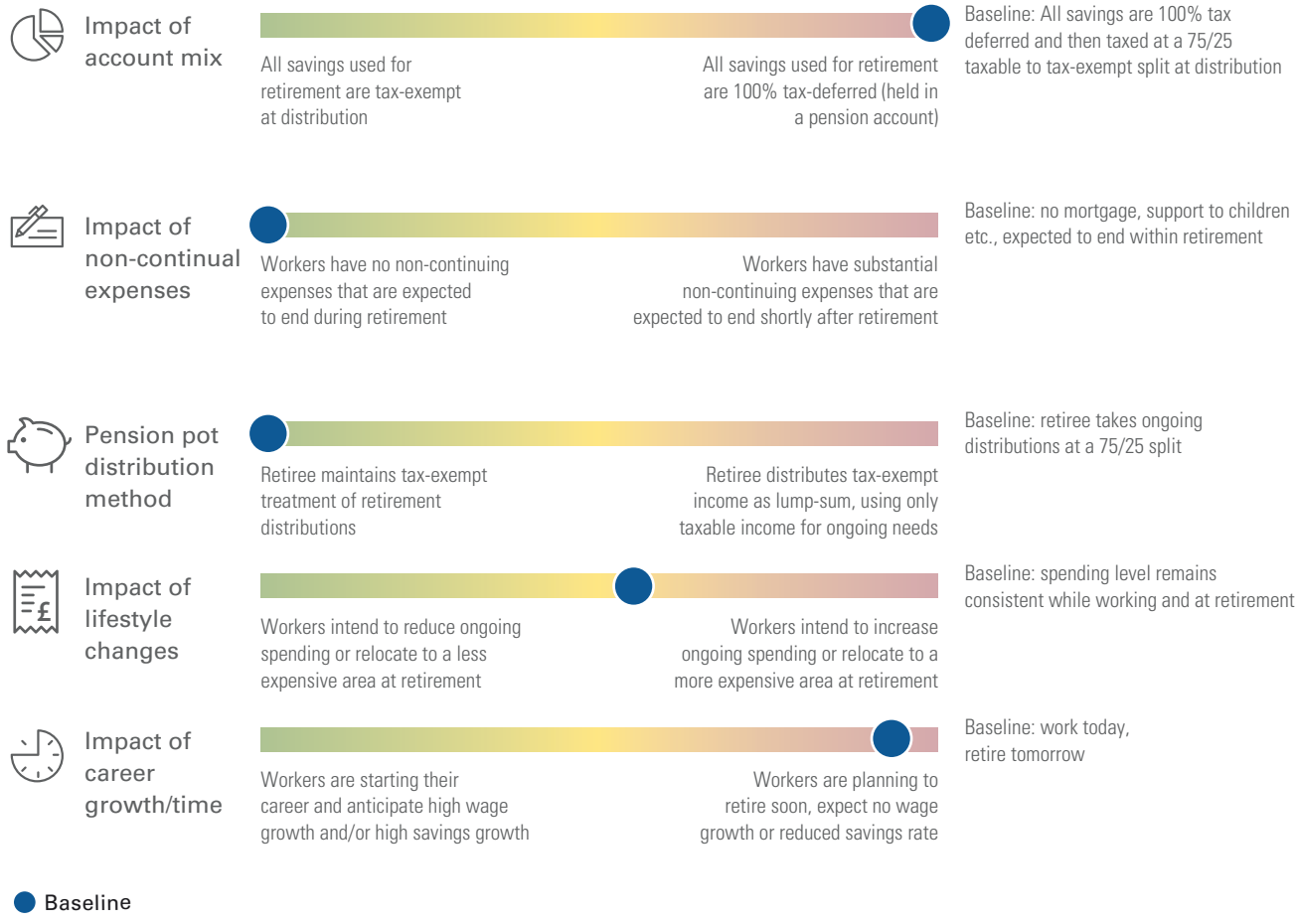
11 Like the old basic State Pension, eligibility for the new State Pension is based on qualifying years of National Insurance (NI) contributions. We have assumed everyone is entitled to the full new pension, but this does depend on various factors, including your age and NI contributions. More details can be found here: https://www.gov.uk/new-state-pension

Personalising the replacement ratio

So far, we have discussed the use of replacement ratios as a starting point for pension planning and how it can differ by income level, savings rate or region. In addition to these drivers, there are personal 'levers' or factors that can move the initial ratio up or down. While there are many likely levers, we focus on the following five differences between otherwise-similar households: the mix of retirement account types, choice of pension pot distribution strategy, career growth and time remaining in career, lifestyle changes in retirement and non-continuing expenses. The baseline assumptions we used with regard to these factors are shown as blue circles in **Figure 5**, while **Figure 6** presents some of the ways investor behaviour and/or circumstances can affect each other and thus the replacement ratio.

What follows are brief descriptions of these five factors and an explanation of how the individual's personal situation can result in a deviation from the initial replacement ratio derived from the table shown in **Figure 3**.

Figure 5: Five factors and the replacement ratio



Notes: Blue circles represent the baseline assumptions used in the calculations shown in **Figure 3**. These baseline assumptions for each factor are as follows: for retirement account mix, all savings used for retirement are from pre-tax distributions (up to pension annual allowance limits), then ISAs, then general investment accounts (GIAs); for pension pot distributions, the retiree chooses to take ongoing distributions in a 75% taxable, 25% tax-exempt split; for career, individual is in their final working year and intends to retire next year at State Pension age; for non-continuing expenses, no further mortgage payments or family support are expected to be required during retirement, and for lifestyle changes, ongoing spending remains constant while working and in year one of retirement.

Figure 6: How personal circumstances influence the replacement ratio

	Account mix	Pension pot distribution method	Career growth/time	Non-continuing expenses	Lifestyle changes
Our baseline assumption is . . .	100% tax-deferred, up to pension annual allowance limits (excess savings placed in ISA, then GIAs).	retirees opt to take ongoing distributions from pension pots in a 75% taxable, 25% tax-exempt split.	currently age 65, planning to retire at age 66.	paid off mortgage before retirement, no other short-term expenses that will end during retirement.	no lifestyle changes assumed.
But this could change if . . .	some percentage of savings could be placed in after-tax accounts, even though the investor is below the Annual Allowance.	individuals elected to receive the tax-exempt portion as a lump sum, then rely solely on taxable assets throughout retirement.	many individuals have years (or decades) of working years ahead.	retirees do not intend to spend any (or a portion of) their eliminated mortgage payments on new ongoing expenses.	some individuals might relocate or otherwise change their ongoing spending needs at retirement.
And if that happens, the initial replacement ratio is likely to move . . .	▼	▲	▼	▼▲	▼▲
Because . . .	greater after-tax savings through ISAs and taxable accounts increases current income taxes, while potentially lowering future taxes.	the loss of tax-exempt income through retirement would increase the 'cost of access' on distributions from personal savings.	workers tend to increase savings rates over their careers, leaving less wage growth available for spending.	removing costs that won't last through retirement reduces the ongoing replacement need (but should be accounted for outside the replacement ratio).	lifestyle changes and location of retirement could result in higher, lower or offsetting costs.

Retirement account type: Since its inception in 1999[12], the tax-exempt individual savings account (ISA) has provided investors with another opportunity to save in a tax-efficient way. Investors can benefit from tax relief today in a traditional pension, with some tax-exempt income later, or 100% tax-exempt income from an ISA with no current tax relief, or some desirable combination of both. As a starting point, we assume that all saving occurs on a tax-deferred basis in a pension until the pension annual allowance[13] is reached. The assumption of favouring pre-tax pension contributions over ISA contributions results in a higher starting point for replacement ratios, with a shift to ISAs resulting in a lower replacement ratio[14].

Making contributions to ISAs and taxable accounts can reduce the replacement ratio in two ways:

1. Favouring after-tax accounts over pre-tax accounts subjects more of the contributions to income taxes immediately, leaving less of the income earned today available for immediate spending.
2. Because ISA distributions and the first £12,300[15] of capital gains from taxable accounts are exempt from tax, individuals pay less to replace an identical amount of spending at retirement than someone relying solely on a pension pot.

Pension pot distribution method: In our baseline scenarios, we assume that retirees opt for an annual crystallisation (or 'drawdown') strategy, where each distribution is treated as 25% tax-exempt, 75% taxable as income. However, the method of crystallisation chosen by retirees can have a significant impact on the target replacement ratio, as well as the overall likelihood of success (Harbron, 2020).[16] This is because the 'loss' of a tax-exempt source at retirement due to a lump-sum crystallisation approach (where the retiree distributes all tax-exempt funds as one capital payment, leaving only taxable income for ongoing needs) can significantly increase the cost of access associated with the replacement ratio.

12 Tax-exempt accounts were in existence before ISAs were introduced in 1999. ISAs replaced Personal Equity Plans (PEPs) and Tax-Exempt Special Savings Accounts (TESSAs).

13 The annual pension allowance, £40,000 for 2020/2021, reduces by £1 for every £2 of income over £240,000 to a maximum of £4,000.

14 It is important to note that a lower replacement ratio does not necessarily ensure a superior outcome. For example, people in their peak earning years could reduce their replacement ratio by making contributions to ISAs instead of pre-tax accounts, but they might then be paying more in income taxes than they need while still remaining well within their lifetime allowance. Investors should consult their tax and financial professionals to determine the appropriate strategy for their personal situation.

15 This is the size of the gains you can take for 2020/2021 before they become subject to capital gains tax.

16 Harbron, Garrett, Warwick Bloore, Josef Zorn, 2019. *UK Retirement Withdrawal Order.* Valley Forge, Pa.: The Vanguard Group.

Of course, you might have something useful to do with the lump sum that helps you realise your retirement dreams in a way other than providing an income, such as repaying a mortgage or buying a second home. Here we wanted to look purely at the impact on your income and therefore assumed that, if the lump sum was spent, it had no effect on spending in retirement (e.g. the money used for the mortgage payment was spent on other things).

In **Figure 7**, we show the impact that eliminating the tax-exempt treatment of annual distributions can have on the target replacement ratio. For those with pre-retirement income at or below £62,500, losing the tax-free portion of the pension has little impact on the initial replacement ratio if ongoing spending remains constant. The same is also true of more aggressive savers at the peak income levels, as they will probably have taxable accounts at their disposal to provide support at more advantaged tax rates[17]. Those on the higher end of the income spectrum are those most likely to be impacted, as the additional tax liability caused by losing the tax-free portion of their income could add more than 10 percentage points to the initial replacement target.

Figure 7: Increase in gross replacement rate by removing tax-free portion from the pension pot

Effect on replacement ratio of loss of tax-free portion*

	Pre-retirement savings rate			
Pre-retirement income	5%	10%	15%	20%
£ 12,500	0.0%	0.0%	0.0%	0.0%
25,000	3.0	2.7	2.4	2.1
37,500	3.6	3.3	3.0	2.7
50,000	3.9	3.6	3.3	3.0
62,500	4.6	3.8	3.6	3.4
75,000	8.4	6.9	5.4	3.9
87,500	10.8	9.6	8.1	6.6
100,000	11.1	10.4	9.7	8.6

*England, Wales and Northern Ireland only.

Source: Vanguard calculations. Differences were obtained from replacement rates with no tax-free portion remaining in the pension pot vs. taking ongoing distributions of 75% taxable, 25% tax-exempt in the initial replacement ratios (**Figures 3b, 4a**). Blue = difference <5%, yellow = difference between 5% and 10%, red = difference greater than 10%. For more information about crystallisation methods and ideal withdrawal orders, please refer to Harbron (2020).

Career growth/time left in career: Earlier, we discussed how our initial replacement ratios were determined based on an individual's spending and income level today. However, most people saving for retirement have many years – if not decades – of their career ahead of them. Those remaining years are likely to see pay rises, promotions, redundancies, career changes and other factors that will shape their earnings at the end of their career. This creates a conundrum: households are most likely to be interested in replacing the earnings they enjoy immediately before retirement (Munell and Soto, 2005), but it is impossible to peer into the future and know exactly what those earnings will be.

Figure 5 shows the relationship between the replacement ratio and the development of a worker's career, with those expecting increasing affluence at one end and those likely to take a step back in earnings on the other. These shifts in income will probably cause a change in the percentage of income allocated to spending from current levels, but the impact might not be as severe as one would expect. Assuming a constant savings percentage, *most people could experience a reduction in their replacement ratio as their career progresses*, even though spending in terms of pounds could still increase on either a nominal or real basis[18]. This is especially true of younger workers, as their willingness and capacity to save increases as they progress in their careers[19].

To get an idea of how one's replacement ratio might change between today and retirement, investors can use the table in **Figure 3** to compare the initial ratios. For example, an investor who earns £25,000 today while saving 5% and expects to end their career at £37,500 and increase their savings rate to 10% would adjust their target replacement rate from 85% to 77%. Using the initial replacement rates in this way can help investors estimate both what their future selves might aim to replace, and whether their actions are sufficient to make that aim achievable.

17 Some of these advantages include access to their principal investment (known as 'basis'), the ability to exempt the first £12,300 of capital gains from taxation, and preferential dividend rates when compared to their respective income tax rates.

18 These findings were based on four possible career paths: baseline (3% wage growth with a constant savings rate), high earners (5% wage growth with a constant savings rate), high savers (3% wage growth with savings increasing to 150% of current levels), and worst case (2% wage growth with a constant savings amount in pounds sterling, NOT as a percentage of (pre-tax) earnings).

19 Source: ONS Dataset 'Median Contribution Rates to Workplace Pensions by Age Group and Sector', employee contributions. While personal savings in general increase with age, this was especially true for private sector employees. It should be noted that public sector employees save a higher percentage when younger and reduce personal contributions as they near the tail end of their career.

Lifestyle changes at retirement and non-recurring expenses: The final levers we identified were related: lifestyle changes made during the move into retirement, and the impact of non-continuing expenses (such as eliminating a mortgage or assisting family members for a portion of one's retirement). In order to remain neutral about lifestyle changes (as shown by the marker in the relevant bar of **Figure 5**), we assume a constant standard of living through the transition from employment to year one of retirement.

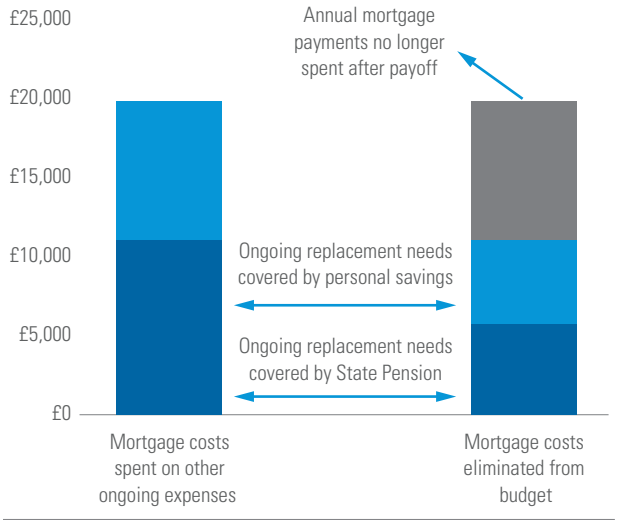
It is commonly thought that spending declines at retirement – but that is not always the case. There are many reasons why spending does not always move in one direction at retirement, but some examples of lifestyle changes than can create a deviation from the initial replacement ratio include:

- Relocating to somewhere more expensive than where one currently lives – or somewhere less expensive.
- Taking on more expensive hobbies and forms of entertainment – or eliminating a large ongoing expense upon retiring.
- Expected health changes later in life, as well as a decision to purchase private insurance to cover higher medical expenditures in retirement.

Perhaps the most common example of a non-continuing expense is the elimination of mortgage payments at (or shortly before) the start of retirement. Depending on their personal preference, some individuals might opt to spend a portion (or all) of their mortgage payments on other costs in retirement, while others might choose to eliminate this outflow from their budget altogether. Looking at **Figure 8**, we use our hypothetical investor from earlier to illustrate the impact that accounting for non-continuing expenses can have on the replacement ratio. Using our initial assumptions about transferring mortgage payments to other ongoing costs results in a replacement rate of 80%, of which the new State Pension would cover approximately 46%. By accounting for the £4,862 annual mortgage payment that no longer exists once repaid, the target replacement ratio is now reduced to only 57%. The drop is accounted for by the eliminated mortgage payments *and* the reduced income tax liability associated with smaller pension pot distributions.

Capturing non-continuing expenses as a cost throughout retirement might significantly overestimate the needs of a retiree, which could result in an artificially low likelihood of retirement success. Adjusting the replacement ratio for non-continuing expenses should therefore result in a more accurate estimate of the ongoing costs that will need to be replaced. That said, it is worth bearing in mind that retirement may bring new expenses that were not incurred before, such a health insurance, second-home mortgage payments or increased leisure costs. They too must be factored into any retirement plan, potentially offsetting some or all of the eliminated non-continuing expenses and savings.

Figure 8: Ongoing spending comparison – keep spending on mortgage vs. removing payments from the budget



Source: Vanguard calculations, using a gross replacement ratio. Assuming annual mortgage payment of £4,862, with remaining difference in ongoing replacement needs attributed to reduced income tax liability. Mortgage estimates obtained using data from ONS Table A49 – Percentage of households by size, composition and age in each income decile group and ONS Table 2.10 – Expenditure on rent and mortgages by renters and mortgage holders by gross income decile group.

Conclusion

The replacement ratio can be a valuable retirement planning input that drives considerations such as the ideal savings rate needed and the potential level of risk one might target for adequate growth. The initial replacement ratio, whether tax-exclusive or tax-inclusive, can be further personalised by evaluating the impact of unique levers such as one's marital status, account type mix, choice of pension growth, desired lifestyle changes and non-continuing expenses.

While too many variables exist to forecast a replacement ratio with exact precision, this approach should help investors understand the difference between what they are on track to replace and what their desired lifestyle would require. As investors progress through their accumulation goals, they are likely to find that their initial replacement ratio will change with their personal situation. Therefore, investors and advisers should not view the replacement ratio as a 'set and forget' concept. Rather, it should be periodically reviewed to fine tune one's progress by providing a gauge to test the effect that major life events might have on a retirement goal.

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