



The 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.
- Most studies suggest aiming for a target of between 70 and 85 percent of pre-retirement income. Knowing which *end* of that range would be more appropriate, however, is an important step in developing a retirement plan.
- With our approach to calculating the replacement ratio, investors begin with their current annual consumption and then factor in the changes in taxes and health-care costs. The replacement ratio is that total amount expressed as a percentage of the investor's pre-retirement income.
- Because people—and thus their retirement goals—are unique, otherwise-similar investors can have different replacement ratios. Variables affecting the desired ratio include broad demographic differences (marital status and income level, for example) as well as more subtle, personalized influences (homeownership, health status, the type of accounts dedicated for retirement, for example).

In a sense, retirement planning can be summarized as a process of asking and answering three questions: How much, how soon, and how feasible? While all three questions 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 just a few years away from hitting this milestone. An investor with a feel for how much of their income they may need to replace at retirement is better able to consider the questions of how much to save, how long to work, and how much market risk to take.

Many investors working toward retirement rely on a replacement ratio as a stand-in for a specific spending level. While the term *replacement ratio* has taken on different meanings in different studies¹, here we define it as *the percentage of pre-retirement income required to maintain a current lifestyle upon the transition to retirement*. Using this definition, we are then able to identify three key components of the replacement ratio: ongoing spending needs, income taxes owed in retirement, and the cost of health care in retirement, as shown in **Figure 1**.

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 are expected to be regular and recurring in nature (Jaconetti et al., 2018).

This paper explains the role a replacement ratio should play in retirement planning, the process used to arrive at a reasonable starting point or initial ratio based on household characteristics, and the effects that certain factors can have on individual retirement needs.

Figure 1. Key components of the replacement ratio

| Replacement need | |
|------------------|--|
| Spending | Ongoing spending—includes both basic and discretionary expenses |
| Cost of access | Taxes associated with income and assets used to support ongoing spending |
| Cost of care | Medicare premiums; additional out-of-pocket health-care expenses during retirement |

The importance of the replacement ratio

How to determine the appropriate replacement ratio

Studies have shown that the most commonly suggested replacement ratios fall between 70 and 85 percent of pre-retirement income, with extreme outliers existing on both the higher and lower ends of the spectrum (Government Accountability Office, 2016). That might not sound like a very wide range—but by aiming for a part of this range that is not right for them, a household could wind up with a significant shortfall or surplus relative to their retirement goal. For example, a household that saves 5% of their income and selects a replacement target of 70% could realize too late that their accustomed lifestyle exceeds what savings and other support can provide. On the other hand, if a household saving 20% of their income opts for an 85% replacement target, they might wind up extending their working years unnecessarily (assuming they do not plan to significantly increase their standard of living).

Developing the target replacement ratio is a two-step process. 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).² This approach places the emphasis on the fact that money *is* spent—not *how* money is spent.

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 Debt accrual or liquidation of savings would result in a positive value. Employer contributions to retirement plans should NOT be included.

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, helping one’s children (or grandchildren) with tuition payments or other temporary support—as well as changes in how one chooses to spend their time and money. Not all influences will apply to every situation, but most households should at least account for the impact that changes in their income taxes and additional health-care costs can have on their actual spending level (and their replacement need).

The initial replacement ratio: A good start

In **Figure 2**, we show the initial replacement ratios for both married couples that file a joint tax return³ and single taxpayers across different income levels and savings rates. These values provide an estimate of what percentage of their income a household would need to maintain their lifestyle if they were to retire next year.⁴ It’s important to note that the replacement ratio is one input that an investor uses to create a retirement plan, not necessarily a measure of what is possible. While

the plan should in turn 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.

Figure 2 shows how certain characteristics make otherwise-similar households appear different with respect to replacement ratios. Our research found that there are three main drivers of the initial replacement ratio: income, marital status, and savings rates.

Income. Lower-income households need to maintain a higher percentage of pre-retirement income to sustain ongoing spending needs than do higher-income cohorts (Aon Consulting, 2008). This is in part because lower-income households owe less federal income taxes while working, and therefore do not receive as much tax relief upon shifting to retirement. In addition, they often need to spend a higher percentage of their pre-retirement income to maintain comparable health coverage through retirement.

Figure 2. Initial replacement ratios for married filing jointly and single households

| Married filing jointly | | | | | | Single | | | | | |
|------------------------|-----------|------|-----|-----|---------|------------------|-----------|-----|-----|-----|-----|
| Savings/year (%) | | 5% | 10% | 15% | 20% | Savings/year (%) | | 5% | 10% | 15% | 20% |
| Today's income | \$ 25,000 | 101% | 96% | 92% | 86% | Today's income | \$ 25,000 | 92% | 87% | 83% | 78% |
| | 50,000 | 91 | 87 | 82 | 78 | | 50,000 | 89 | 84 | 79 | 74 |
| | 75,000 | 91 | 85 | 80 | 74 | | 75,000 | 89 | 84 | 79 | 73 |
| | 100,000 | 91 | 86 | 81 | 75 | | 100,000 | 89 | 83 | 78 | 73 |
| | 125,000 | 89 | 85 | 80 | 75 | | 125,000 | 89 | 83 | 79 | 73 |
| | 150,000 | 88 | 83 | 79 | 74 | | 150,000 | 91 | 86 | 80 | 71 |
| | 175,000 | 88 | 83 | 78 | 73 | | 175,000 | 92 | 87 | 80 | 69 |
| | 200,000 | 89 | 83 | 78 | 73 | | 200,000 | 93 | 88 | 79 | 69 |
| | 300,000 | 90 | 85 | 79 | 69 | | 300,000 | 93 | 82 | 71 | 63 |
| | 400,000 | 92 | 87 | 77 | 67 | | 400,000 | 93 | 75 | 66 | 59 |
| 500,000 | 92 | 85 | 72 | 64 | 500,000 | 91 | 72 | 64 | 57 | | |

Notes: All savings are assumed to be pre-tax until the household has exceeded IRS salary deferral limits for defined contribution plans; all excess contributions are made into a taxable account. Other assumptions: Investor lives in a zero-tax state while working and during retirement and either rents or has paid off their home and reallocated 100% of mortgage payments to other ongoing expenses. Married filing jointly households assume a two-worker household where both spouses contribute equally to household income. Health-care costs in year one of retirement were determined by using Medicare premiums for Parts B and D, cost of insurance for Part D coverage, and net increased out-of-pocket health-care costs between working and retirement.

Sources: Vanguard calculations, using 2018 tax rates, brackets, and standard deduction/exclusion levels while working and 2019 tax rates, brackets, and standard deduction/exclusion levels while retired.

³ Replacement ratio tables assume (for married filing jointly households) a two-worker household where both spouses equally contribute to household income. While Social Security taxes, benefits, and maximum defined-contribution plan contributions can vary between married filing jointly households with one worker compared to those with two workers, the difference in replacement ratios was within 5% for all but one of the 44 possible scenarios.

⁴ This assumes all applicable retirees are currently 65 years old and plan to retire at age 66, which is the earliest a person could claim Social Security retirement or spousal benefits without incurring a reduction.

Marital status. In general, married couples that file a joint tax return tend to have a higher replacement ratio than single persons of similar income and savings habits.⁵ This is more likely the result of the favorable tax treatment afforded to married couples filing a joint return (compared with a single taxpayer of equal income and savings) rather than the need to feed, clothe, insure,

transport, etc., two people instead of one. However, a lower replacement ratio does *not* necessarily result in a reduced target account balance for a single person; as **Figure 3a** (on page 6), shows, single households receive less support from Social Security than otherwise-similar married households do.

The two-step process: An example

To the right is an example of this framework applied to a 65-year old couple earning \$100,000 per year and saving 10% on a pre-tax basis. In addition to federal income taxes, out of each paycheck they receive, 7.65% is withheld for Social Security and Medicare taxes (also known as FICA). Lastly, they pay \$2,600 a year for health insurance through their employer. After all savings, tax withholdings and employer-sponsored deductions, the couple has about \$72,800 available for spending throughout the year.

Once they have retired, their goal is to maintain the same lifestyle as they had the year before. To determine how much they would need to do that, they would take into account the impact of inflation on their spending, purchase health insurance via Medicare⁶, and consider the impact of taxes when distributing from their pre-tax retirement plan for spending needs. They will require approximately \$86,000 from Social Security and distributions from their pre-tax retirement accounts to maintain their lifestyle in year one of retirement. Put another way: For them, \$86,000 in year one will buy the same quality of life that \$100,000 did the year before.

Assumptions

Age: Both spouses are 65, retiring at 66
Marital status: Married, filing jointly
Household income: \$100,000
Personal savings rate: 10% of income, all pre-tax

Working: Final year

\$100,000 gross income
 – \$6,200 Social Security taxes
 – 1,450 Medicare taxes
 – 6,915 federal income taxes
 – 10,000 savings
 – 2,600 employer benefits
 = **\$72,835 available for spending**

Retirement: First year

\$72,835 last year's spending
 + \$1,457 cost of living increase
 + 5,704 health-care costs
 + 6,118 federal income taxes
 = **\$86,114 needed to maintain spending**

\$86,114 / \$100,000 = 86% replacement ratio

Notes: Health-care costs in year one of retirement were determined by using Medicare premiums for Parts B and D, cost of insurance for Part D, and net increased out-of-pocket health-care costs between working and retirement.

Sources: Vanguard calculations, using 2018 tax rates, brackets, and standard deduction/exclusion levels for final year of work and 2019 tax rates, brackets and standard deduction/exclusion levels for first year of retirement.

⁵ We did find outcomes where a single person had a higher replacement ratio, most commonly around the \$150,000 to \$400,000 income level. This is most likely because single workers were no longer subject to the 6.2% Social Security withholding tax after exceeding the earned income threshold (in 2018, \$128,400), while each worker in a married, two-worker household remained under the threshold for a longer period.

⁶ Normally, Medicare Part B and Part D premiums for the current year are determined by the modified adjusted gross income (MAGI) on the previous year's tax return, which is determined by income received from the year before. This means income received two years earlier will determine the premiums for the current year. However, the Social Security Administration does allow for an adjustment if a life-changing event—including "work stoppage"—could reduce the income-related monthly adjustment amount (IRMAA) used to estimate Medicare premiums.

Savings rates. Our approach assumes that any money that is not taxed or saved is assumed to be spent; therefore, a higher savings rate results in less income available for current spending (and vice versa). All things otherwise equal, a higher savings rate results in a lower replacement ratio required to maintain current spending habits.

Figure 2 provides a reasonable starting point in estimating an individual's replacement need; however, many personal factors (touched on later in this paper) will likely increase or decrease the target replacement ratio between today and year one of retirement.

Social Security and its role in the replacement ratio

It can feel overwhelming for an investor to learn they could need upwards of 100% of their pre-retirement income to maintain their lifestyle at retirement. Fortunately, few investors are alone in this endeavor. 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 Social Security 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.

The progressive structure of Social Security means that its benefits cover a greater percentage of pre-retirement income for lower-income households, with relative support diminishing as income increases. For example, a single retiree who earns \$50,000 per year and saves 5% of income might have 36% of their replacement target (shown in Figure 3a) covered by Social Security, while an otherwise-similar person making \$150,000 would receive benefits that supported only 23% of their target⁷.

After determining the initial replacement ratio and accounting for the amount of support available from outside sources, the investor arrives 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 aim to solve for when determining their progress towards their retirement goal.

While the difference in overall replacement ratios might not differ greatly between households with similar savings rates or marital status, the percentage that must be covered through personal savings can be dramatically different, as shown in **Figure 3b** (on page 6). This is a direct result of the amount of support offered from outside sources such as Social Security. In our example, the difference in the replacement ratio for a single person making \$50,000 per year and saving 5% and the ratio for an otherwise-similar investor earning \$150,000 is only 2 percentage points; however, *in terms of the portion of pre-retirement income that must be replaced through personal savings*, the difference jumps to 15 percentage points!

Personalizing the replacement ratio

So far, we have discussed the use of replacement ratios as a starting point and how one's ratio can differ by income level, marital status, and savings rate. In addition to these drivers, there are "levers" or factors that can move the initial ratio up or down. While there are likely many potential levers, we focus on the following five differences between otherwise-similar households: the mix of retirement account types, health status at retirement, career growth and time remaining in career, lifestyle changes at retirement, and non-recurring expenses. The baseline assumptions we used with

⁷ Social Security benefits were based on the Social Security Administration's quick calculator, using current income and electing for benefits at full retirement age. Workers with an earnings history higher than assumed are likely eligible for greater benefits, and therefore could receive more support from Social Security benefits than estimated in this study.

Figure 3. Some of the replacement ratio will be covered by outside income sources; the rest needs to be covered by personal savings

a. Percent of replacement ratio covered by Social Security, by household type

Married filing jointly

| Savings/year (%) | | 5% | 10% | 15% | 20% |
|------------------|-----------|-----|-----|-----|-----|
| Today's income | \$ 25,000 | 58% | 61% | 65% | 68% |
| | 50,000 | 48 | 51 | 54 | 57 |
| | 75,000 | 40 | 43 | 46 | 49 |
| | 100,000 | 36 | 38 | 41 | 44 |
| | 125,000 | 34 | 36 | 38 | 40 |
| | 150,000 | 32 | 34 | 37 | 39 |
| | 175,000 | 31 | 33 | 35 | 38 |
| | 200,000 | 29 | 31 | 33 | 36 |
| | 300,000 | 23 | 24 | 26 | 29 |
| | 500,000 | 15 | 16 | 18 | 21 |

Single

| Savings/year (%) | | 5% | 10% | 15% | 20% |
|------------------|-----------|-----|-----|-----|-----|
| Today's income | \$ 25,000 | 48% | 50% | 53% | 56% |
| | 50,000 | 36 | 39 | 42 | 45 |
| | 75,000 | 32 | 34 | 37 | 39 |
| | 100,000 | 29 | 31 | 33 | 36 |
| | 125,000 | 26 | 27 | 29 | 31 |
| | 150,000 | 23 | 24 | 25 | 29 |
| | 175,000 | 20 | 21 | 23 | 26 |
| | 200,000 | 18 | 19 | 21 | 24 |
| | 300,000 | 12 | 14 | 16 | 18 |
| | 500,000 | 7 | 9 | 11 | 12 |

b. Percent of pre-retirement income required from personal savings, by household type (Figure 2 minus Figure 3a)

Married filing jointly

| Savings/year (%) | | 5% | 10% | 15% | 20% |
|------------------|-----------|-----|-----|-----|-----|
| Today's income | \$ 25,000 | 43% | 35% | 27% | 18% |
| | 50,000 | 43 | 36 | 28 | 21 |
| | 75,000 | 51 | 42 | 34 | 25 |
| | 100,000 | 55 | 48 | 40 | 31 |
| | 125,000 | 55 | 49 | 42 | 35 |
| | 150,000 | 56 | 49 | 42 | 35 |
| | 175,000 | 57 | 50 | 43 | 35 |
| | 200,000 | 60 | 52 | 45 | 37 |
| | 300,000 | 67 | 61 | 53 | 40 |
| | 500,000 | 74 | 68 | 56 | 43 |

Single

| Savings/year (%) | | 5% | 10% | 15% | 20% |
|------------------|-----------|-----|-----|-----|-----|
| Today's income | \$ 25,000 | 44% | 37% | 30% | 22% |
| | 50,000 | 53 | 45 | 37 | 29 |
| | 75,000 | 57 | 50 | 42 | 34 |
| | 100,000 | 60 | 52 | 45 | 37 |
| | 125,000 | 63 | 56 | 50 | 42 |
| | 150,000 | 68 | 62 | 55 | 42 |
| | 175,000 | 72 | 66 | 57 | 43 |
| | 200,000 | 75 | 69 | 58 | 45 |
| | 300,000 | 81 | 68 | 55 | 45 |
| | 500,000 | 84 | 64 | 53 | 45 |

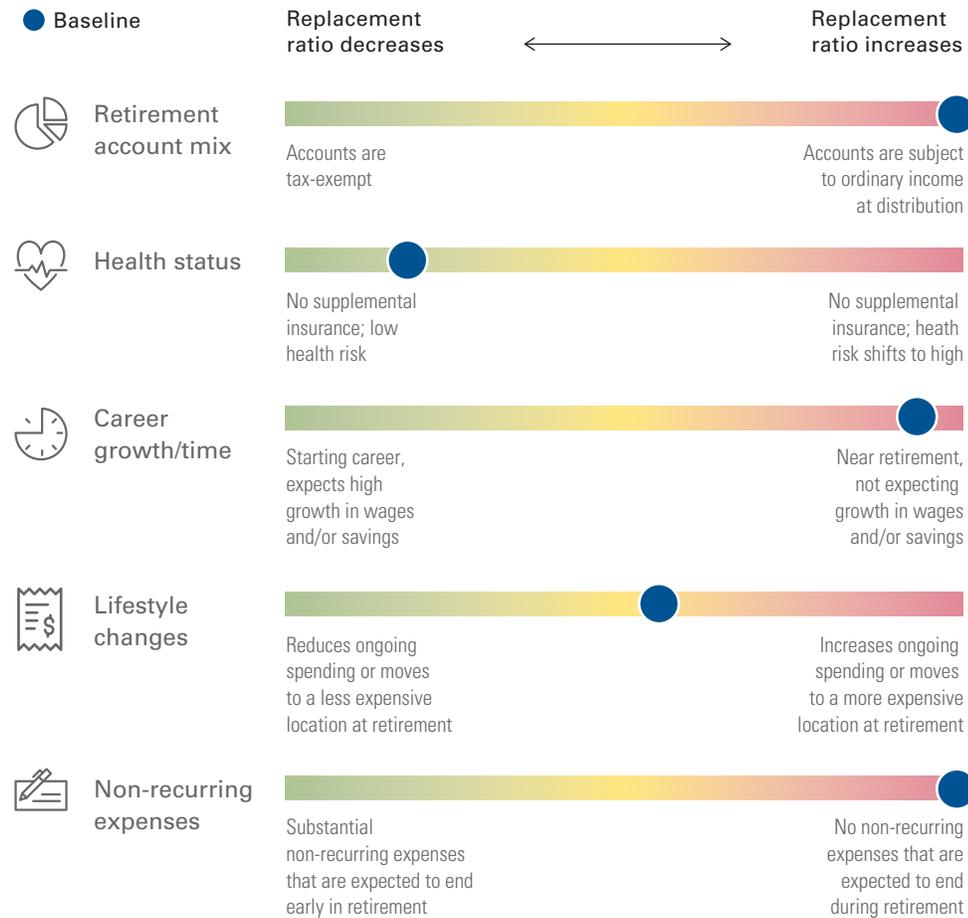
Notes: Married filing jointly tables assume a two-worker household where each spouse receives equal Social Security benefits. Social Security spousal benefits provide greater support at the lower half of observed income levels (+8% for \$25k, +5% for \$50k, +9% for \$75k, +9% for \$100k, +5% for \$125k, and +2% for \$150k, on average), and less support for the upper half of observed income levels (-1% for \$175k, -2% for \$200k, and -4% for \$300k, -4% for \$400k, and -4% for \$500k, on average). Other assumptions used in these tables: In two-worker households, each spouse earns an equal amount of household income; in one-worker households, all income is earned by one spouse; all recipients begin benefits at full retirement age. Claiming early can reduce the amount of ongoing spending support Social Security provides, while delaying benefits could increase the level of ongoing spending support. The assumed claiming age of 66 is a baseline assumption and is not intended to be a recommendation for the ideal claiming age in any specific situation. Figure 3b subtracts the amount of support from Social Security shown in Figure 3a from the baseline replacement ratio shown in Figure 2.

Sources: Vanguard calculations, using estimated benefits and default assumptions from the Social Security Administration's quick calculator.

regard to these factors are shown as blue dots in **Figure 4**, while **Figure 5** (on page 8) presents some of the ways investor behavior and/or circumstances can affect each factor and thus the replacement ratio.

What follows are brief descriptions of these five factors and an explanation of how one’s personal situation could result in a deviation from the initial replacement ratio that one would arrive at using the table shown in Figure 2.

Figure 4. Five factors and the replacement ratio



Notes: Blue dots represent the baseline assumptions used in the calculations shown in Figure 2. These baseline assumptions for each factor are as follows: For retirement account mix, all accounts used for retirement are pre-tax; for health status, no supplemental insurance, average risk status; for career, household is in their final working year and intends to retire next year at full retirement age; for non-recurring expenses, no mortgage or support of children, etc., is expected to end during retirement; and for lifestyle changes, ongoing spending remains consistent while working and in year one of retirement.

Source: Vanguard calculations.

Figure 5. How personal circumstances can influence the replacement ratio

| | Retirement account mix | Health status | Career growth/time remaining in career | Lifestyle changes | Non-recurring expenses |
|---|---|--|--|---|---|
| Our baseline assumption is . . . | Investor’s retirement accounts are 100% pre-tax up to IRS salary deferral limits for DC plans; excess savings placed in taxable account | Investor has Medicare parts B and D, average health risk | Investor is currently age 65 and plans to retire at age 66 | Investor does not plan to make lifestyle changes | Investor will have paid off mortgage before retirement and has no other short-term expenses that will end during retirement |
| But this could change if . . . | Some percentage of savings were placed in Roth accounts, providing tax-exempt income at retirement | Investor purchases additional coverage, or shifts to a higher health risk at retirement | Investor has years (or decades) of work ahead | Investor relocates or otherwise changes their spending patterns at retirement | Mortgage balances and other short-term costs are carried into retirement |
| And if that happens, the initial replacement ratio is likely to move . . . | ▼ | ▲ | ▼ | ▼ ▲ | ▼ |
| Because . . . | Choosing Roth over pre-tax savings increases current income tax liability while also potentially lowering income taxes at retirement | High-risk households might purchase more comprehensive health-care coverage or incur greater out-of-pocket costs | Workers tend to increase savings rates over their careers, leaving less wage growth available for spending | Lifestyle changes and location of retirement could result in higher, lower, or offsetting costs | Removing costs that won’t last through retirement reduces the ongoing replacement need. Estimated costs of non-recurring expenses at retirement should be accounted for outside the replacement ratio |

Retirement account type. Since the inception of the Roth IRA over 20 years ago, investors saving for retirement have had more options to accumulate assets on both ends of the tax spectrum. As a starting point, we assume that all savings occurs on a pre-tax basis until salary deferral limits for defined contribution plans are met. The assumption of favoring pre-tax contributions over Roth contributions results in a higher starting point for replacement ratios, with a shift to Roth-based retirement accounts resulting in a lower replacement ratio.⁸

Making contributions to Roth IRAs and Roth accounts inside employer-sponsored retirement plans can reduce the replacement ratio in two ways:

1. Favoring Roth accounts over pre-tax accounts subjects more of the contributions to federal income taxes immediately,⁹ leaving less of the income earned today available for immediate spending.
2. Because qualified Roth distributions are exempt from income taxes, individuals pay less taxes to replace an identical amount of spending at retirement than someone relying on pre-tax accounts.¹⁰

⁸ It is important to note that a lower replacement ratio does not necessarily ensure a superior outcome. For example, people at peak earning years could reduce their replacement ratio by making contributions to Roth accounts instead of pre-tax accounts, but they could be paying more in income taxes overall as a result. Investors should consult with their tax and financial professionals to determine the appropriate strategy for their personal situation.

⁹ Residents of all but nine states need to consider the impact of state income taxes. We found that the difference in effective state income tax rates between working and retirement was not substantial if spending remained the same. A sharp reduction in the replacement ratio would be mostly explained by reduced spending needs, not the savings of state income taxes.

¹⁰ Assuming tax rates, brackets, and treatment of accounts remain constant to today’s levels and rules in real terms.

Health status. Much attention has been given to the uncertain and increasing impact of health-care costs throughout retirement. In addition to experiencing more costs associated with aging, many retirees lose valuable employer subsidies associated with health care, forcing them to shoulder much of the financial burden from insurance premiums and out-of-pocket costs. In Figure 2, we assume retirees are of average health and purchase Medicare Part B (medical coverage) and Medicare Part D (prescription drug coverage) with no supplemental or private insurance in place. While our initial replacement ratios assume enrollment in Medicare Parts B and D only, most retirees have some form of supplemental coverage as well. However, since supplemental coverage varies widely in both range of premiums offered and in types of care covered, it's quite difficult to include a consensus figure in any baseline calculations.¹¹

Since our starting replacement ratios do not estimate any costs of supplemental coverage, an investor might choose to push their target replacement ratio higher. Retirees should also consider how their household's health status could affect the replacement ratio. Those at risk might choose to purchase more comprehensive health insurance coverage or could incur greater out-of-pocket costs than otherwise assumed.

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

Figure 4 shows the relationship of the replacement ratio to the projection of a worker's career, with those expecting higher growth on one end and those taking a step back in earnings on the other. These changes in income over time will likely cause the percentage of

income allocated to spending to change from current levels, but the impact might not be as much as one might expect. In fact, *most people could experience a reduction in their replacement ratio as their career progresses*, even though their spending in dollar terms could still increase on either a nominal or real basis.¹² This is especially true of younger workers, as their willingness and capacity to save increases as they progress in their careers (Aon Consulting, 2018).¹³

Lifestyle changes at retirement and non-recurring expenses. The final levers we identified were related: lifestyle changes upon transitioning into retirement, and the impact of non-recurring expenses (such as paying off a mortgage or assisting family members during a portion of one's retirement). In order to remain neutral about lifestyle changes (as evidenced by the dead-center marker in the relevant bar of Figure 4), 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. In fact, a recent study showed that most households enjoyed the same standard of living upon retiring, with 13% of respondents stating that their standard of living improved (Alliance Bernstein, 2018). There are many reasons why spending does not always move in one direction at retirement, but lifestyle changes that can push spending up or down 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 retirement, such as no longer driving 30 miles to work.
- Purchasing a bigger home to host family events—or selling a primary residence in order to downsize.

Perhaps the most common example of a non-recurring expense is that of having a remaining mortgage balance at the start of retirement. Investors preparing for retirement today are more than three times as likely to have a mortgage than similar households thirty years ago (Collins, Hembre, and Urban, 2018), although few

¹¹ For more information, please see Weber et al. (2018).

¹² These findings were based on the observation of 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 dollars, not as a percentage of [pretax] earnings).

¹³ One could argue that savings capacity never changes, as debt payments are shifted to savings as workers age and various debts (student loans, credit cards, etc.) are paid off.

households expect to have a mortgage throughout the entirety of their retirement.¹⁴ Capturing non-recurring expenses such as a mortgage or short-term support for family members as an ongoing concern could meaningfully overestimate the ongoing needs of a retiree, which could result in an artificially low likelihood of retirement success.

Although adjusting the replacement ratio for non-recurring expenses helps produce a more accurate estimate of the ongoing costs that will need to be replaced, non-recurring expenses cannot be ignored. In making their retirement plan, investors must account for the impact of any such expenses at retirement—in addition to the amount of savings necessary for their ongoing replacement need.

Conclusion

A 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, which is an individual's ongoing spending needs plus the cost of care and the cost of access, can be personalized by evaluating the impact of unique levers such as one's account type mix, health status, projected career growth and remaining working years, desired lifestyle changes, and non-recurring expenses.

While too many variables exist to forecast a replacement ratio with exact precision, this approach should help investors narrow the range of target ratios as they try to estimate their future retirement needs. As investors progress through their accumulation goals, they are likely to find that their initial replacement ratio will change with their personal situation. Therefore, a replacement ratio should not be considered a "set it and forget it" concept. Rather, it should be periodically reviewed to fine-tune one's progress and gauge the effect that major life events such as a change of employment or marital status might have on a retirement goal.

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¹⁴ Source: "Does Your Mortgage Retire With You?" American Financing. Retrieved on November 12, 2018; available at: www.americanfinancing.net/reverse-mortgage/mortgage-options-after-retirement.

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