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# What's the right savings rate?

## Give your participants a place to start: Target replacement income rate multiplied by 30%. Simply put: TRI 30

Defined contribution plan sponsors who have encouraged plan participation with educational materials and plan design features such as auto-enrollment have also helped participants understand the need to save for retirement. But participants still struggle with how much to save.

This paper offers DC plan sponsors a practical approach to guiding participants toward appropriate individual savings rates, which we call "TRI 30."

The average savings rate in defined contribution (DC) retirement plans is around 7%.[1] Presumably, this would jump to 10% or 13% with a typical company match (of 50% or 100% on the first 6% of salary contributed).[2] This range is consistent with survey results suggesting that plan sponsors recommend an optimal savings rate of 10% to 15%.[3] But what is that range based on? Is the savings rate automatically escalated over time? Most importantly: Will it lead to a timely retirement with an acceptable standard of living?

Plan participants cannot guarantee retirement success. However, those who save adequately relative to their retirement spending expectations will greatly diminish their exposure to risk factors outside their control. Despite the development of new investment options for DC plan participants in recent years, such as target date funds, the best "hedge" against retirement income inadequacy remains a consistent and adequate commitment to saving. Participants should focus on what they can control: the amount they save each year while working.

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The question I will try to answer in this paper is: What *is* the right savings rate?

This is a difficult question, given that the answer differs for individual participants. However, by exploring two distinct but related questions, I can provide a more structured framework for finding the answer. This framework will help plan sponsors better answer the question "Are my participants saving enough?" and take appropriate steps, via plan design, toward improving participant behavior.

## Question (1): For a high chance of achieving their target replacement income, or "TRI," how much should DC plan participants save?[4]

"Target replacement income," or TRI, means the percentage of final, pre-retirement gross salary participants will need in order to maintain inflation-adjusted spending in retirement, net of Social Security. For example, a TRI of 60% would mean $60,000 annually for someone who makes $100,000 in the year before retirement. It turns out that for a given TRI, generating a ballpark estimate of how much to save is fairly straightforward. Specifically, Russell Investments' research has yielded several rules of thumb that tell us what a given participant should save each year for a high chance of success. The "base case" for these rules of thumb, which applies to a new retirement saver with 40 working years ahead, is called the "TRI 30" approach – whereby saving 30% of the TRI each year, including any employer contribution, leads to about a 90% probability of reaching the TRI.[5]

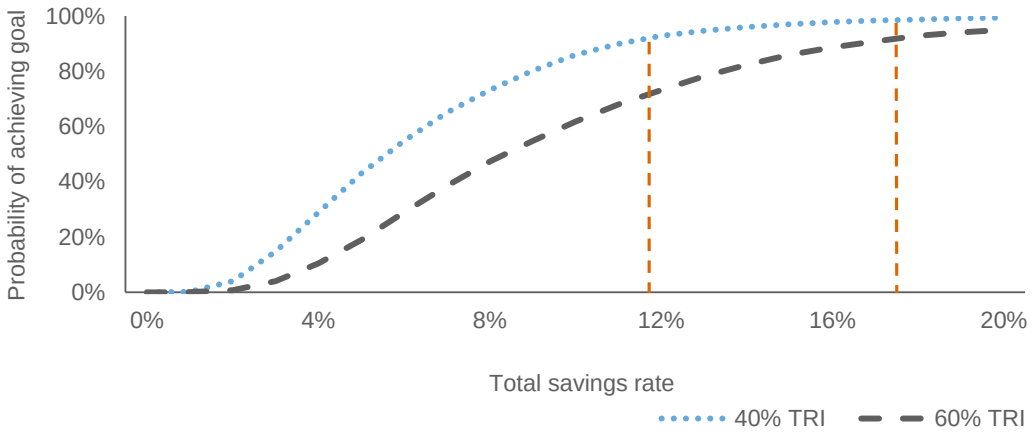
*TRI = Target Replacement Income rate. It is a specific percentage of one's final, pre-retirement salary.*

*TRI 30 = 30% of the TRI. It is a "rule-of-thumb" for an appropriate savings rate.*

### The answer to question (1) – How do you determine the right savings rate to achieve the TRI?

I simulated retirement outcomes in terms of income replacement rates for several hypothetical participants contributing at different rates (including any employer contributions), throughout their careers.[6] The asset allocation for the participants was based on the Morningstar Lifetime Allocation Moderate Index.[7] Exhibit 1 shows the participants' chances of meeting a 40% TRI (dotted line) as well as a 60% TRI (dashed line) from their DC plan.

**Exhibit 1: Probability of achieving TRI as a function of total savings rate: baseline case with sponsor match**




Source: Russell Investments, Morningstar. See Appendix for return and asset allocation assumptions.

Our analysis reveals that a total savings rate of at least 12% will offer a high probability (more than 90% chance) of meeting the 40% replacement rate. Similarly, a savings rate of at least 18% will offer a high probability of success for a 60% replacement rate.

Interestingly, both the 12% and 18% savings rates are 30% of the desired replacement rate. (Keep in mind that the rule is based on very specific assumptions – in this case, a 40-year savings horizon.) **This is a key insight: the amount the plan participant needs to save for retirement is a direct function of her TRI – in this case, 30% of that TRI, including the employer contribution.** Describing a participant's retirement savings rate in terms of her TRI can greatly simplify the retirement savings puzzle. This is the basis of the TRI 30 approach.

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TRI 30 allows us to find a good savings rate, not just for a 25% or 50% TRI, but for any TRI. Here are two quick examples of the math behind TRI 30:

1. If TRI = 30% of pre-retirement income:

   TRI 30 = 30% * 30% = 9% savings rate (participant and sponsor total)

2. If TRI = 55% of pre-retirement income:

   TRI 30 = 55% * 30% = 16.5% savings rate (participant and sponsor total)

IRS limits to contribution amounts prevent many high-income participants from being able to save enough in a DC plan. These participants should look to invest in a supplemental out-of-plan account, e.g. an IRA.

**WHY IS A 90% SUCCESS RATE DEEMED ACCEPTABLE? WHY NOT SOMETHING HIGHER OR LOWER?**

*A 90% success rate, based on the assumption of uninterrupted contributions, is a reasonable success rate for balancing before- and in-retirement living standards.[8] Targeting a greater success rate may imply a preference for unusual consumption in the distant future, over current consumption. Targeting a lower success rate may fail to take into account the reality that workers experience lapses in savings and/or tap their retirement accounts for non-retirement needs.*

*Targeting a higher success rate could require, Russell Investments believes, saving at a level that excessively sacrifices one's pre-retirement standard of living in exchange for potentially higher consumption in retirement. This does not seem desirable. The typical pattern of lifetime consumption is "hump"-shaped, peaking in middle age.[9] In addition, retirees may have more time available to help make up for potential reductions in spending.[10]*

*Targeting a success rate substantially* lower *than 90% on the basis of uninterrupted contributions may lead to inadequate savings rates in real-world cases. Participants, especially women, may not work for 40 years without interruption. This leads to lower levels of accumulated savings than anticipated by a simple projection model.[11] Leakage of assets (from loans, etc.) may further reduce retirement savings.*

## What about participants who do not fit the basic assumptions? What should they save?[12]

Exhibit 2 summarizes factors that we believe impact the appropriate savings rate and shows how changing each of these factors could change the determination of the appropriate rate. We limit our discussion to just two variables in each row – the factor (left column) and the contribution rate – and assume that all other factors remain the same. Of course, many of these factors interact with one another in ways we will not consider here. To further streamline our discussion, we leave the asset allocation factor alone, while acknowledging that it can serve as a helpful tool for participants seeking to manage risk in their retirement portfolios.

**Exhibit 2: All else equal, how do different factors impact the appropriate savings rate?**

| FACTOR | IF FACTOR INCREASES, CONTRIBUTION RATE SHOULD… | IF FACTOR DECREASES, CONTRIBUTION RATE SHOULD… | COMMENTS |
|---|---|---|---|
| **Net worth (accumulated savings less debt)** | Decrease | Increase | Higher net worth participants need not rely as much on their ongoing contributions, all else equal. |
| **Assumed average asset returns** | Decrease | Increase | If average returns increase, participants may decrease their contributions while maintaining the same result. |
| **Fees** | Increase | Decrease | Fees effectively reduce returns in each period. However, participants can benefit from easy-to-use trading platforms, alpha from active management, access to asset allocation advice and financial planning tools, etc. |
| **Inflation rate** | Increase | Decrease | Higher inflation raises future (nominal) salaries and contributions. We assume it passes through to the participant through pay increases. Therefore, it raises final salary and the assets needed to achieve a TRI |

| | | | |
|---|---|---|---|
| | | | tied to that salary. The inflation rate after the retirement date matters as well; if higher inflation persists into retirement, participants would need to save more while working. In addition, inflation and asset class returns interact in complex ways. Inflation does tend to erode the value of financial assets such as listed stocks and bonds, which may further increase the need for future saving in a highly inflationary environment. |
| **Real salary growth rate** | Increase | Decrease | The impact of higher real salary growth is similar to that of higher realized inflation. While a higher salary growth rate raises future salaries and contributions, it also raises final salary and the assets needed to replace a TRI tied to that salary. Higher pay increases paradoxically lead to the need to increase the retirement savings rate as participants increase their future standard of living. |
| **Salary** | No effect (if $0 savings)<br>Increase (if accumulated savings > $0) | No effect (if $0 savings)<br>Decrease (if accumulated savings > $0) | In the case of zero savings, salary does not matter in our analysis, since we are targeting a *percentage* of salary for income replacement, not a specific amount of salary. We acknowledge that changes in salary level can affect the TRI needed to maintain one's lifestyle.[13] In the case of non-zero accumulated savings, for a given dollar level of accumulated savings, a higher salary will spur the need for greater contributions, while a smaller salary will reduce the need for contributions. |
| **Length of time until retirement** | Decrease | Increase | A longer pre-retirement period means participants have more time to accumulate assets, so their appropriate savings rates may be reduced. |
| **Retirement age** | Decrease | Increase | Deferring retirement means participants can reduce their contribution rates, because of both the longer pre-retirement period and the shorter retirement period. |
| **Age of savings commencement** | Increase | Decrease | Starting to save later means participants need to contribute at higher rates to catch up. In fact, contributing from a young age is one of the most positive actions participants can take toward meeting their retirement goals. |
| **Target replacement income (TRI)** | Increase | Decrease | A higher target demands higher contributions. The TRI 30 formula functions as a rule of thumb for the necessary contribution rate for young participants. |

## Question (2): What TRI is sufficient to fund one's retirement?

While this number is different for every individual, some interesting research looks into answering this question for different demographic groups.

A well-known replacement-rate study by AON Consulting and Georgia State University[14] provides some conventional analysis on how to determine the correct TRI. For example, the study suggests that someone with a pre-retirement income of $90,000 needs to target a total replacement rate of 78% to maintain a similar standard of living in retirement. Because 36% will come from Social Security, another 42% will need to come from savings; thus a TRI of 42%. In contrast, someone with a pre-retirement income of $50,000 needs to target a similar but slightly higher total replacement rate, 81%. Because Social Security replaces a greater percentage of lower-paid workers' pre-retirement incomes – in this case, 51% – the study would suggest that the TRI for this individual is 30%.

However, many factors can influence what the goal should be. The numbers quoted above are the baseline case in a report that analyzes dozens of scenarios. In addition, there are other studies, including research from the Employee Benefit Research Institute, that cite different key factors.[15] We've developed three key insights, based on the available research, regarding considerations for determining an individual's TRI.

### 1. There is no single number that can guarantee retirement adequacy.

The volatility of retirement risks (e.g., investment returns, longevity and health care) makes planning for retirement very difficult. Many retirement planning tools do not account for this volatility, which exacerbates the problem. For example, over a 20-year period, the average annual return on stocks could realistically be anywhere between zero and 17%.[16]

### 2. The volatility of health care expenses is a primary driver of retirement adequacy heartburn.

This comes in large part from unanticipated long-term care expenses. The average cost of a semi-private room in a nursing home exceeds $75,000 annually.[17] Medicare and private health insurance generally do not cover long-term care. Medicaid may provide relief, but only for someone who has very little wealth, as Medicaid is means-tested. Long-term-care insurance is a private market alternative, but it tends to be very expensive.

### 3. Low- to moderate-income participants face an uphill battle in saving for retirement.

Lower-income participants will receive a proportionately more generous Social Security benefit and pay relatively fewer taxes in retirement (this is clear from the AON study). However, low- to moderate-income participants tend to have proportionately higher day-to-day expenses than higher-income participants, which makes saving for retirement more difficult. Further, health care expenses may not be linked to income levels, primarily due to long-term-care needs. Higher-income participants, with more assets and savings, will likely be better prepared to spend five figures annually on assisted living expenses in retirement than will lower-income participants.

So, it is clear that coming up with a TRI is not as simple as looking it up in a single table. However, that doesn't mean we should just throw our hands in the air and ignore this issue. It is important for DC plan sponsors to combine the known research in the field with knowledge of their employees and specific total benefits programs when setting TRI ranges for their participants.

*Both the match rate and the default contribution rate send a signal to participants about how much to save, and have a material impact on participants' behavior.*

## How to use TRI 30 and plan design features to improve participant outcomes

Once a sponsor has decided on a reasonable TRI range for plan participants, and understands the TRI 30 method to saving, the next step is to embed that knowledge in the plan's design through the company match and auto-features.

Both the match rate and the default contribution rate send a signal to participants about how much to save, and have a material impact on participant behaviors. The match can be structured to encourage participants to save more, but without impacting the company's bottom line. Further, research from EBRI and the Defined Contribution Institutional Investment Association indicates that more aggressive implementation of auto-features can bolster retirement readiness.[18] So, sponsors need to approach these aspects of plan design in a thoughtful manner.

### Impact of TRI 30 on the match formula

Suppose a sponsor decides that a 50% TRI is appropriate for the "typical" plan participant. Per TRI 30, the sponsor could then conclude that a 15% savings rate, including the sponsoring organization's contribution, is a good goal for participants. This sponsor is willing to contribute a match of, at most, 5% of pay to the DC plan. Traditionally, the match would be dollar for dollar on the first 5%. Instead, here's one possible alternative:

- 75% match on the first 5% (total contribution = 5% + 0.75*5% = **8.75%**)
- 25% match on the next 5% (total contribution = 8.75% + 5% + 0.25*5% = **15%**)

This match would implicitly encourage a higher savings rate than a more traditional match and would not change the company's contribution budget. A participant who maximized the match would be saving the full 15%. However, this match policy still significantly helps those participants who can't afford to save the 10% required for the full company match.

## Impact of TRI 30 on the default contribution rate

To complement this alternative match formula, the sponsor could implement auto-enrollment and automatic contribution escalation to get participants all the way up to a 15% savings rate:

- 6% in year 1 (total contribution = **10%**)
- 2% increase in year 2 (total contribution = **12.5%**)
- 2% increase in year 3 (total contribution = **15%**)

## Summary

The TRI 30 approach provides a framework DC plan sponsors can use to help participants answer the question, "What is the right savings rate?" We encourage you to take this information and put it into action:

- Conduct a comprehensive review of your plan's demographics to fully understand your "typical" participant and determine a TRI for your plan.
- Use that information to review your plan's features, such as match, auto-enrollment and auto-escalation, and determine how you can best structure your plan to drive participants to saving at the right level.
- Design a robust communications plan to help your participants better understand what they should be saving.

We understand that TRI 30 is not the answer for everyone, but we believe a framework such as this will help plan sponsors have a smarter conversation about setting reasonable goals and designing a plan that better helps participants achieve retirement peace of mind.

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[1] Vanguard, "How America Saves 2014." Average participant deferral rate for Vanguard record-kept plans in 2013.

[2] Plan Sponsor Council of America 57th annual survey, "Reflecting 2013 Plan Experience." About three of four DC plans in the survey had one of these two match structures, and there was an even split between the two.

[3] DCIIA, "Plan Sponsor Survey 2014: Focus on Automatic Plan Features," June 2015.

[4] Many thanks to Russell Investments colleague Brandy Swift for suggesting a similar acronym.

[5] I define success in meeting that goal as purchasing a life annuity at a retirement age of 65 that provides the desired income replacement initially with an annual 2.6% cost-of-living-adjustment for inflation. I chose this method because it mitigates longevity risk and dampens the impact of inflation on spending, simplifying the "How much is enough?" question.

[6] Salary growth rate (1.3% on average, with higher growth at younger ages) and career length (40 years) are the "default" inputs outlined in Russell Investments' target date methodology paper, "Review of Russell Investments' target date fund (TDF) methodology," September 2014.

[7] This is not intended to be an endorsement of the Morningstar product. Rather, we want to focus on the *savings rate*, not the asset allocation, so we thought it sensible to use popular "benchmark" target date fund glide path. A different investment strategy assumption would lead to a different assessment of the appropriate savings rate.

[8] I have endeavored to keep this section free of economic jargon. For the economists out there, this section could be summed up as follows: A modeled 90% success rate for a hypothetical, 40-year-career worker does a reasonable job of equating pre-retirement consumption to *certainty-equivalent* in-retirement consumption for a realistic worker who experiences lapses in saving.

[9] Aguiar, Mark, and Erik Hurst. "Deconstructing Lifecycle Expenditure." September 2008.

[10] Hurd, Michael D., and Susann Rohwedder. "The Retirement Consumption Puzzle: Actual Spending Changes in Panel Data." April 2008.

[11] Pfau, Wade. "How Representative are Representative Workers? An Assessment of the Hypothetical Workers Commonly Used in Social Security Studies." June 2009.

[12] The following section and Exhibit 2 are adapted from the Russell Investments Research paper, "Finding an appropriate savings rate for different DC plan participants.".

[13] For more information on how salary can affect required replacement rates, see the 2008 AON/Georgia State University Replacement Rate Study, available at http://tinyurl.com/87hbuxl.

[14] AON Consulting's 2008 Replacement Ratio Study™: A Measurement Tool for Retirement Planning.

[15] VanDerhei, Jack. EBRI Issue Brief No. 297, "Measuring Retirement Adequacy: Calculating Realistic Income Replacement Rates," September 2006. Park, Youngkyun. EBRI Issue Brief No. 357, "Retirement Income Adequacy with Immediate and Longevity Annuities," May 2011.

[16] Ezra, Don, Bob Collie and Matt Smith. "The Retirement Plan Solution: The Reinvention of Defined Contribution." Wiley, 2009. p. 42.

[17] Genworth, "Cost of Care Survey." March 2013.

[18] Source: Jack VanDerhei and Lori Lucas, "The Impact of Auto-enrollment and Automatic Contribution Escalation on Retirement Income Adequacy." EBRI Issue Brief No. 349, and DCIIA Research Report (November 2010).

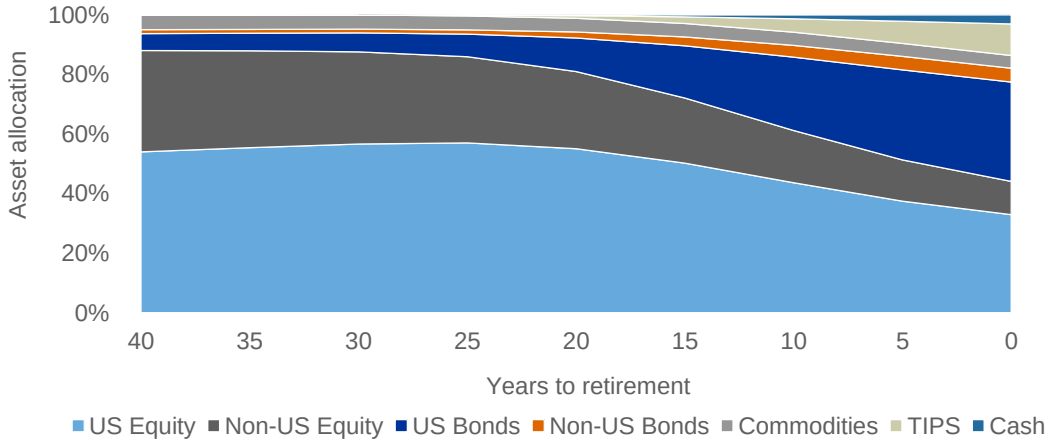
# Appendix

### Return and correlation matrix for Exhibit 1

| | | | CORRELATION MATRIX | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **ASSET CLASS** | **MEAN** | **VOLATILITY** | **U.S. EQUITY** | **NON-U.S. EQUITY** | **U.S. BONDS** | **NON-U.S. BONDS** | **COMMODITIES** | **TIPS** | **CASH** |
| **U.S. Equity** | 7.6% | 18.1% | 1.00 | | | | | | |
| **Non-U.S .Equity** | 7.9% | 18.4% | 0.90 | 1.00 | | | | | |
| **U.S. Bonds** | 3.4% | 2.9% | 0.11 | 0.04 | 1.00 | | | | |
| **Non-U.S. Bonds** | 3.5% | 5.1% | 0.18 | 0.05 | 0.63 | 1.00 | | | |
| **Commodities** | 6.8% | 17.1% | 0.34 | 0.40 | 0.18 | 0.31 | 1.00 | | |
| **TIPS** | 3.7% | 5.5% | 0.14 | 0.06 | 0.48 | 0.72 | 0.26 | 1.00 | |
| **Cash** | 3.5% | 5.9% | 0.10 | 0.00 | 0.55 | 0.87 | 0.33 | 0.76 | 1.00 |

Source: Russell Investments. Analysis is based on 5,000 Monte Carlo simulations using December 2014 capital market assumptions shown above. Assumptions are based on a 20-year planning horizon.

### Morningstar Lifetime Allocation glide path illustration for Exhibit 1




Source: Morningstar Lifetime Allocation Indexes. Data are as of June 2014, and is available at https://corporate.morningstar.com/us/documents/Indexes/AssetAllocationsSummary.pdf

**AUTHOR:** Dan Gardner

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