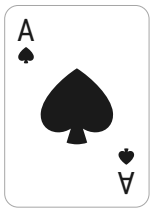
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Defined contribution

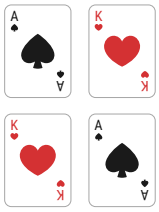
Beneath the surface: Hidden complexity in DC plans

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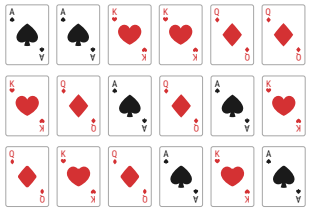
This DC-focused paper is about hidden complexities, so it may be useful to start with a thought experiment. Take a standard deck of playing cards and give them a good shuffle. Congratulations! You are almost certainly the first person in the history of the universe to create that exact order of cards. If you find that hard to believe, look at the illustration below.



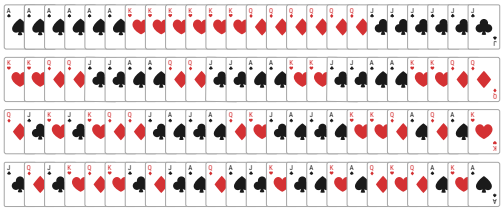
1 card
1 arrangement



2 cards
2 arrangements



3 cards
6 arrangements



4 cards
24 arrangements

It's clear to see how quickly the number of arrangements can get unwieldy as you add more cards to the mix. In fact, the number of ways you can arrange a full deck is 8.07 x 10^67 — an unfathomably large number. But you still may ask yourself: With all the casinos, online card games, home games, etc., wouldn't there have to be instances where repeat arrangements occurred? As you ponder that, consider that there are more ways to arrange a deck of cards than:



The number of grains of sand on Earth



The number of stars in the observable universe



The number of atoms on Earth



The number of seconds since the universe began

This mind-bending stat clearly shows how something inherently simple, like a deck of cards, can hide immense complexity. We took this idea and applied it to the four DC topics below. They all start off with a concept that seems simple, but, beneath the surface, hides complexities that sponsors should carefully consider.

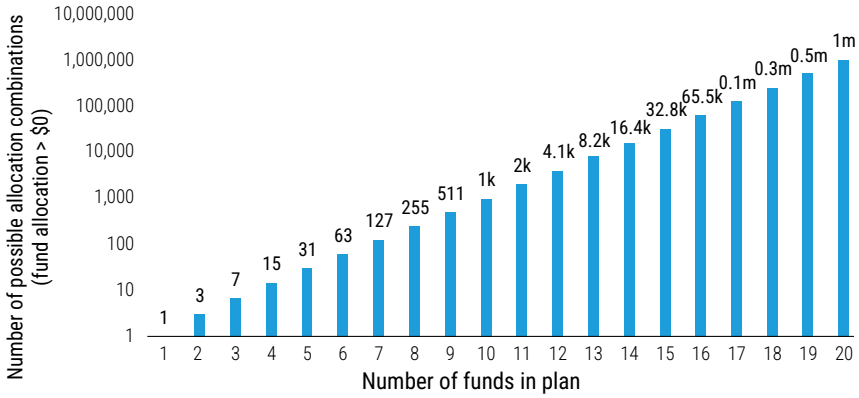
In this paper

	Topic	Takeaway
1	Choice proliferation implications in determining plan lineup size	Consider ways to further simplify the participant allocation decision-making process
2	Similar long-term returns don't mean similar outcomes	Review money-weighted evaluation metrics as complements to traditional measurements
3	Evaluating drastically different advice portfolios for the same individual	Take care to determine the items that should influence investment advice and how providers use these items
4	The challenges in selecting a single retirement success metric	Take a holistic view and evaluate a participant's retirement readiness from several different angles

1. Choice proliferation implications in determining plan lineup size

We'll start with an example that is a close parallel to the playing cards illustration. The average number of investment options offered in a typical DC plan is 25.5 (median of 24.0).[1] That means that a participant deciding how to allocate their contributions needs to decide for each of those 26 options whether they will invest or not — and if yes, then how much? For retirement and investment professionals, this asset allocation and manager selection exercise may seem straightforward, but for non-experts, it can be a herculean task.

In fact, without even considering the amount a participant allocates to each fund and only looking at the binary decision of whether to invest in the fund or not, the number of possible combinations the participant can select grows exponentially with the size of the plan lineup. As shown below, the number of combinations is manageable with one, two, three or even four options. From there, however, combinations explode into the hundreds, thousands and potentially millions of possibilities. If we think about the average plan with ~26 options, that's ~67 million possible combinations for participants to consider.



Source: Columbia Threadneedle Investments

Of course, humans use heuristics to help make difficult decisions (e.g., assuming that saving 15% will set them up for retirement). However, we would argue that participants who may not understand investment basics are not set up for success when faced with this degree of complexity. Thankfully, the successful use of auto-enrollment into qualified default investment alternatives (QDIAs) mitigates this challenge for many.

Key takeaway:
Sponsors should consider ways to simplify the participant decision-making process for fund allocation.

[1] 2025 PLANSPONSOR Defined Contribution Plan Industry Report. This likely counts each target date fund separately, so if the total target date suite is counted as one option, the total would be closer to the 15–17 option range.

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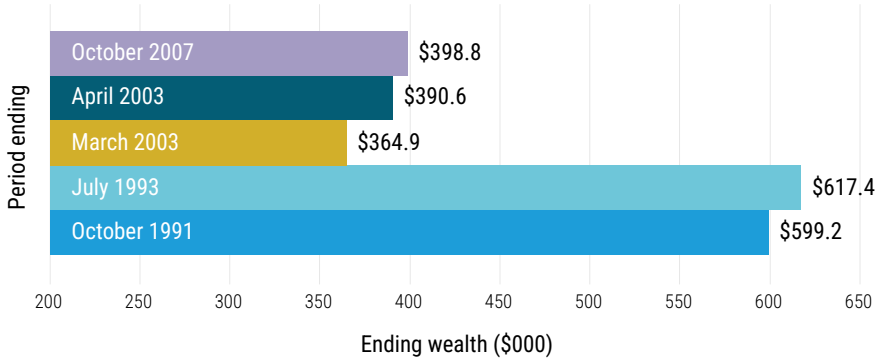
2. Similar long-term returns don't mean similar outcomes

Investment analytics have evolved over time to include dozens of measures of manager skill. Still, no metric is more touted than superior long-term returns. While the phrase "past performance is not indicative of future results" may be the most recognized disclaimer in our industry, long-term returns still serve as a cornerstone for sponsors when assessing strategies for their plans. So, here's a question:

How will participants fare if their portfolios earn 12% per year over 20 years?

Inflation aside, 12% nominal returns may feel like a great outcome, given historical equity market performance. $10,000 invested at 12% per year over a 20-year period would grow to $96,463. However, understanding how participants fared is more complex. Since 1970, there have been five 20-year periods where the S&P 500 returned exactly 12% — periods ending October 1991, July 1993, March 2003, April 2003 and October 2007. For each of these periods, we ran a simplistic example of a participant earning a salary of $50,000 per year (increasing by 3% each year) and contributing 10% to their plan, invested solely in the S&P 500.

Wealth accumulation over 20-years[2]



These results display the impact the path of returns has on wealth accumulation. In the time periods reviewed, our participant could have earned as much as $617k or as little as $365k. There was the potential for nearly a 70% increase in wealth just from following an advantageous path!.* Even for the two periods that were one month apart (March and April 2003), the difference in wealth was around $26k — a 7% difference from one month.

Over a 40+ year career, the compounded difference could be even more severe.

While some sponsors have integrated retirement success metrics into areas such as target date fund reviews, the analysis above calls into question why you would not undertake similar analysis for all DC investments. A simplified money-weighted approach may highlight whether certain strategy types (e.g., lower volatility or those with material diversification benefits) could potentially add value from a wealth accumulation perspective.

Key takeaway:
Review money-weighted evaluation metrics as complements to traditional measurements.

[2] Source: eVestment. Used all 20-year periods where S&P 500 return = 12%. Modeled participant earning $50,000 a year and contributing 10% where salary increases by 3% per year. Investment is 100% in the S&P 500.

*We are defining an advantageous path as one where this illustrative participant has relatively higher ending wealth compared with the other path.

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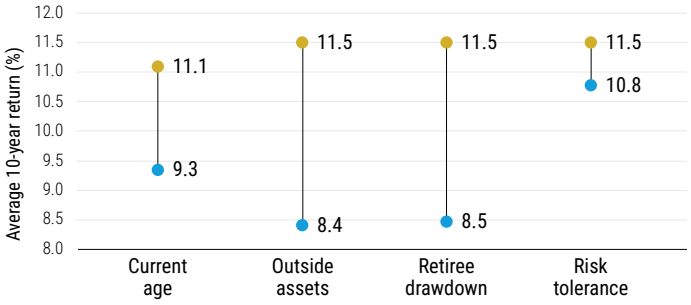
3. Evaluating drastically different advice portfolios for the same individual

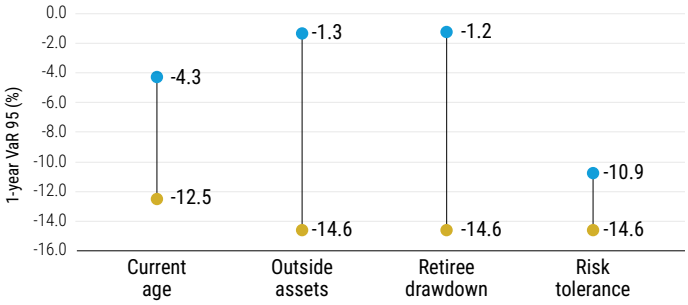
Personalization is a growing trend in DC, with recognition that customizing for individual needs becomes even more important as plans transition from historically acting as accumulation vehicles to becoming primary retirement income sources for retirees. Today, 48% of plans offer professionally managed account services to their participants.[3] Given the widespread access to third-party fiduciary advice, it is reasonable to expect that while providers strive to differentiate their processes, their asset allocation philosophies will generally fall within a similar range. However, an analysis by the Defined Contribution Institutional Investment Association (DCIIA) in 2021 suggests something very different.[4]

In the study, DCIIA worked with five managed account providers and started by creating a "baseline participant" to see how the providers would allocate that participant's assets.[5] The resulting portfolios had differences in terms of portfolio construction (e.g., equities versus diversified return-seeking), but all had total risk assets in the 90%-100% range. They then varied several factors (such as age, risk tolerance, etc.) to see the impacts to the suggested portfolio allocations. The results varied materially across providers, with some calling for wholesale changes while others suggested small tweaks (if any). Below are select factor shifts and the range of changes based on the providers' models.

Current age	Outside assets	Current drawdown	Risk tolerance
45 to 65	**Cash to stocks/bonds**	**0% to 4%**	**Moderate to conservative**
Return-seeking decreases between 11% and 52%	Return-seeking decreases between 0% and 71%	Return-seeking decreases between 0% and 70%	Return-seeking decreases between 0% and 19%

To test the impact of these shifts on portfolio outcomes, we used proxies for return-seeking assets (the S&P 500) and conservative assets (the Bloomberg U.S. Aggregate Index) with return data going back to 1976. Below, we show the average change in the 10-year return and the 1-year value at risk (VaR 95) based on the range of allocation shifts and assuming 95% return-seeking assets as the baseline.





The results show enormous differences, highlighting the embedded biases that each provider has, and the importance of various factors in their asset allocation frameworks. Lowering returns by up to 3% per year or decreasing 1-year drawdown risk by 13% per year is anything but trivial.

Key takeaway:
Sponsors should take care to determine the factors that may influence investment advice and assess how providers are using those factors.

[3] 2025 PLANSPONSOR Defined Contribution Plan Industry Report
[4] Managed Accounts Asset Allocation Review, DCIIA
[5] Baseline: Age 45, compensation of $60,000, outside assets of $30,000 (all cash), moderate risk tolerance, no spending needs, $75,000 current balance, 5% contribution rate, no auto-escalation, assumed age 65 retirement, male, dual household income, living in Ohio.

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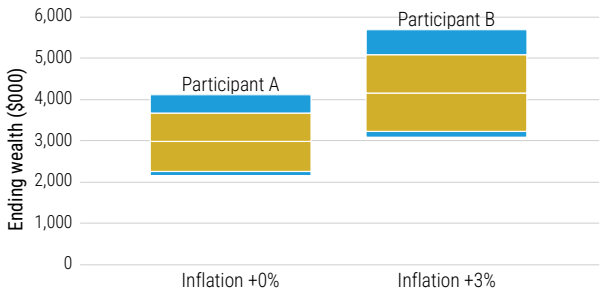
4. The challenges in selecting a single retirement success metric

Earlier, we mentioned the need to transition to a retirement outcome framework when assessing the efficacy of a DC plan. However, retirement outcome frameworks also hold considerable complexity. To illustrate this, we examined two participants earning $50,000 per year and investing 10% per year in a typical target date fund over a 40-year horizon.[6] The main difference between the participants is that one sees their salary increase at the rate of inflation every year (Participant A) while the other sees their salary increase at the rate of inflation + 3% (Participant B).

Savings rate as a gauge for success

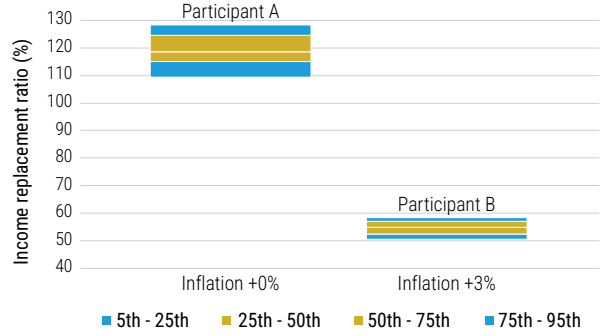
The two participants have the same savings rate of 10%. Since target savings rate is a popular standard for assessing whether participants are on track, some sponsors may look at these participants and say that they are on similar trajectories.

Wealth accumulation: Building a nest egg



However, Participant B's additional salary increase has material consequences that should be accounted for. Looking at rolling 40-year periods since 1976, we see that Participant B accumulated significantly more wealth than Partipant A. This makes sense as the faster salary growth led to higher contributions on a dollar basis. Based on this metric, a sponsor may conclude that a participant with a **higher** salary growth is in a better position for retirement.

Replacement ratio: A spending mindset



At the same time though, a sponsor may also review income replacement ratios as a way to assess a participant's ability to spend in retirement. By this measure, Participant A is notably higher than Participant B. This is due to Participant A's early investments growing more meaningfully relative to their salary. Based on this metric, a sponsor may conclude that the participant with a **lower** salary growth is in a better position for retirement.

Key takeaway:
Sponsors should take a holistic view and evaluate a participant's retirement readiness from several different angles.

[6] Source: eVestment and Columbia Threadneedle Investments. Target date glidepath moved linearly between the following points: 95% equity at 30 years to retirement (and prior), 85% equity at 20 years to retirement, 65% equity at 10 years to retirement, 40% equity at retirement. Equity investment is the S&P 500 and bond allocation is the Bloomberg U.S. Aggregate. Salary growth rates of inflation + 0% and inflation + 3% were used. Replacement ratios were calculated as 20-year annuities using the historical rates of the Federal Thrift Savings Plan as a proxy.

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For all of the examples we've reviewed today, the main message is: Always take a deeper look into areas that many may take for granted in DC. Beneath the surface there may be more to the story than meets the eye.

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