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Defined contribution plans: Missing the forest for the trees?

The Empower Institute**ABSTRACT**

For decades, the defined contribution industry has focused on the performance of individual funds at the expense of other plan metrics. In this paper, we analyze a series of variables — fund selection, asset allocation, portfolio rebalancing, and increasing deferral rates — to determine which factors may have the greatest potential impact on an individual's portfolio. Our analysis suggests that putting fund performance front and center in terms of the plan sponsor's priorities is an error with far-reaching implications. That is not to say that fund performance does not matter, but our analysis suggests it is a much less powerful variable compared with asset allocation and, most of all, higher deferral rates.



What matters most?

In this study, we begin with the question “What matters most?” — asking it on behalf of DC plan sponsors and participants who wish to secure better retirement savings outcomes. Since the advent of DC plans, the lion’s share of attention has focused on fund performance. Indeed, on an annual and even more frequent basis, plan sponsors have long sought to identify and stock their DC plans with the best-equipped or lowest-cost investment vehicles for growing participant wealth. Furthermore, in accordance with their role as fiduciaries, plan sponsors have spent significant time and resources educating their participants about the value of diversification, portfolio rebalancing, and saving more. But how important are these factors? What is the best use of the plan sponsor’s time and energy?

In pursuit of answers to these questions, this study quantifies the hypothetical impact of individual fund performance using several fund selection methodologies. It then moves to an assessment of asset allocation, rebalancing, and deferral rate increases. The end goal is to quantify the practical impact of specific tactics that may help steer plan sponsors and advisors away from an excessive, fund-centric focus. As we will show, there may be better ways to spend your time.

The base case

We begin our analysis by formulating a base-case investment scenario for an individual’s portfolio. We assume the individual was 28 years old in 1982, earned an income of \$25,000 per year, and received a 3% annual cost-of-living increase. Because it falls close to the inception of defined contribution plans in the United States, 1982 is a good year in which to start our analysis. In addition, the individual’s \$25,000 annual salary is in line with Bureau of Labor Statistics data reporting average salaries for a variety of professional classes at the time. The 401(k) plan available to this individual offers a match of \$0.50 on the dollar up to 6%. Furthermore, this person was invested in a conservative asset allocation across six asset classes. Also, as an important controlling factor in our study, for each asset class we assume contributions are invested in a 4th-quartile fund — a fund ranking among the bottom 25% of its Lipper peer group — based on three-year performance data. We also assume that the individual deferred 3% of

gross salary into the plan, that there is no rebalancing of account assets, and that no asset allocation changes are made over time. Thirty-one years later, the individual was 58 years old, earned an income of \$60,682 per year, and had a 401(k) balance of \$205,551.

1. The first driver: fund selection

From our base case (4th-quartile fund selection), we will now investigate drivers of retirement wealth accumulation by considering the impact of having a different fund lineup. Rather than the 4th-quartile portfolio, we will look at four other fund selection scenarios, three of which might generally be regarded as realistic strategies, with the fourth being unrealistically “perfect.”¹

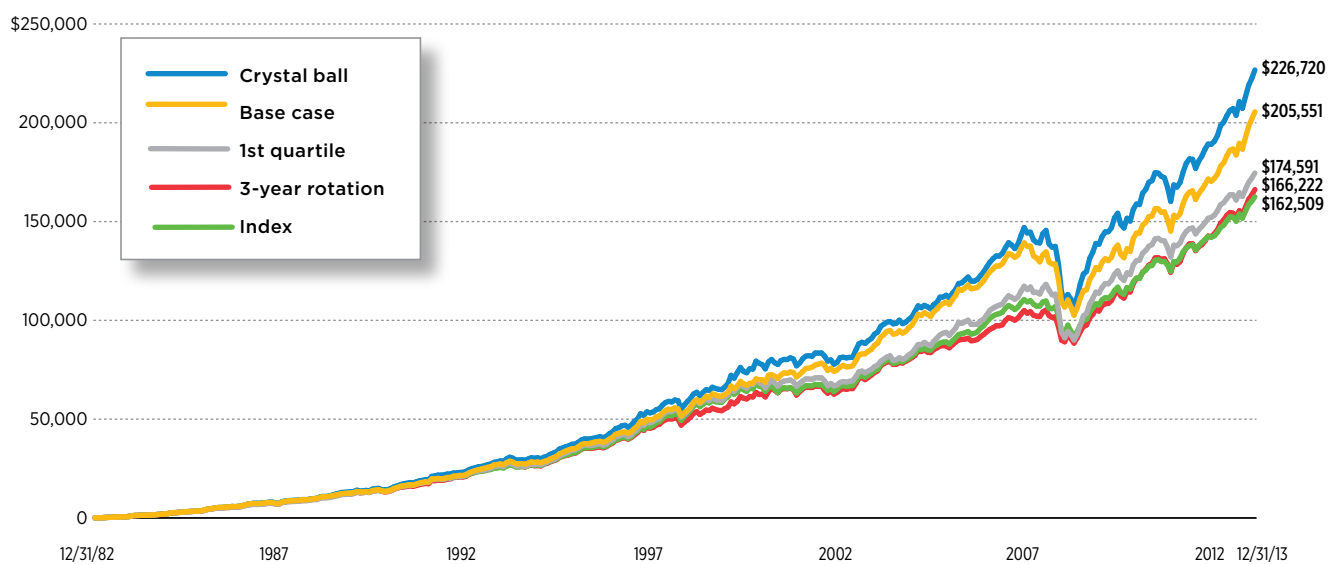
First quartile. The first hypothetical scenario is a buy-and-hold strategy in which only 1st-quartile funds (at or near the 25th percentile) were held for the 31-year investing period. That is, we substitute 1st-quartile funds, based on their three-year ranking as of December 31, 1982, instead of using 4th-quartile funds, and assume the individual holds these funds, as in the base case, throughout the 31-year time frame.

Three-year rotation. In the second hypothetical scenario, we select an initial lineup of 1st-quartile funds, again based on three-year peer-relative performance, but this time, to the extent that funds have fallen out of the 1st quartile after three years, we replace them with new 1st-quartile funds (funds at or near the 25th percentile). This process repeats itself every three years. This is a typical practice employed by many plan sponsors as they seek to comply with their Investment Policy Statement.

Index funds. In the third hypothetical scenario, we assume that rather than focus on actively managed funds, the plan sponsor seeks to reduce cost by choosing index funds. These investments are assumed to be held for the entire period under analysis.

Crystal ball. In this hypothetical scenario, we assume that the plan sponsor would have used a crystal ball to predict funds in the 1st quartile for the next three-year period and accordingly put these in place ahead of time on a rolling three-year basis. If it were possible, this strategy will always give the individual marginally better investment returns.

¹ See notes on methodology at the end of this paper for more details.

Figure 1. The impact of fund replacement in a hypothetical portfolio

Data are historical and based on hypothetical investment scenarios outlined in Section 1 using the base case. Past performance is not a guarantee of future results. More recent returns may be higher or lower than those shown. Investment return and principal value will fluctuate, and shares, when redeemed, may be worth more or less than their original cost.

Interestingly, regardless of strategy, fund selection generated roughly the same amount of wealth (Figure 1). The crystal ball strategy improved the base case by roughly \$21,000. Having perfect foresight and being able to predict future 1st-quartile funds would have improved the individual's outcome by a 10% cumulative difference above the \$205,551 obtained in the base-case strategy.

What is surprising is that in the study the best strategy that one could implement was the base case itself, where terminal wealth was between roughly \$30,000 and \$43,000 ahead of the indexing, three-year rotation, and 1st-quartile strategies. This illustration offers an important caution for those who think that a fund's track record is an indication of its future success. It would sound prudent to put a 1st-quartile strategy in place, or to monitor and manage the lineup so it always made "good" funds available to participants. But when we map out the alternatives, the differences — even over a long time frame — are relatively small, and importantly, changing a plan's underlying funds for justifiable-seeming reasons may in fact detract from performance.

2. The second driver: asset allocation

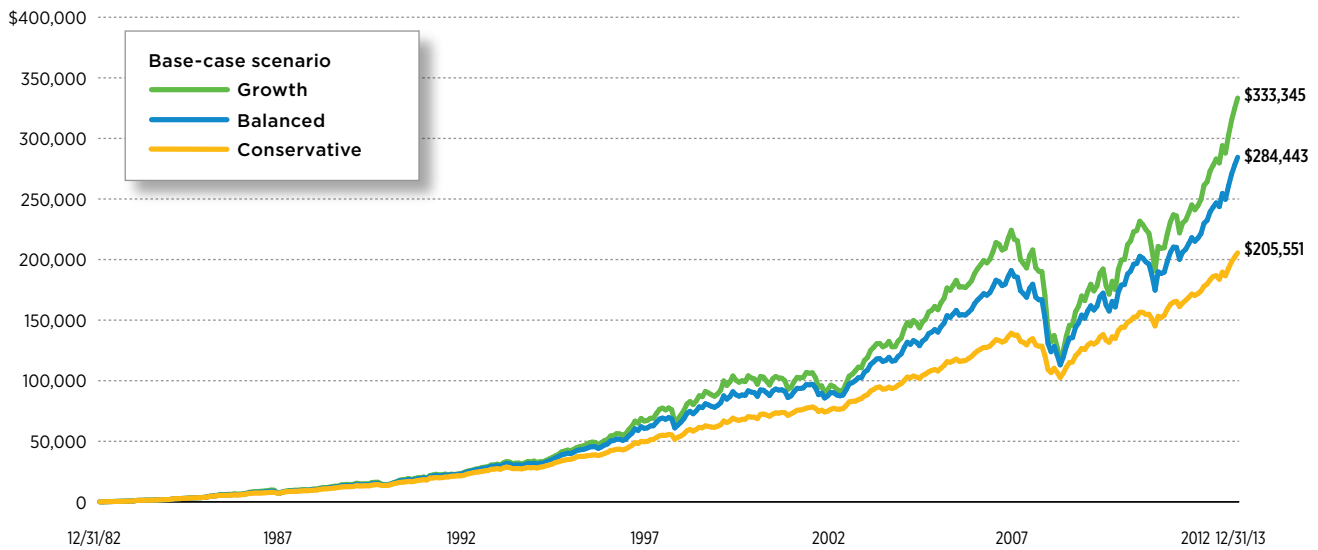
Turning from investment selection, we look next at the potential impact of adjusting the portfolio's asset allocation. After all, if the base case relies on a conservative portfolio allocation, perhaps a larger allocation to equities and a smaller allocation to fixed-income components could have a meaningful impact on portfolio results, particularly over a time frame of 31 years.

Leaving the 4th-quartile base portfolio in place, we dial up its risk/return profile, taking the asset mix from a conservative model (30% equity) to a balanced (60% equity) as well as to a growth (80% equity) model. Figure 2 breaks down each asset allocation into equity and fixed-income subcategories that map onto the Lipper classifications used in our study.

Figure 2. Asset allocation scenarios

Portfolio	Conservative	Balanced	Growth
U.S. equity			
Large growth	10%	20%	25%
Large value	10	20	25
Small cap	5	10	15
International equity	5	10	20
U.S. bonds	60	35	15
Money market	10	5	0

Figure 3. Changing asset allocation (hypothetical portfolio)



Data are historical and based on hypothetical asset allocations modeled in Section 2 with the base-case funds. Past performance is not a guarantee of future results. More recent returns may be higher or lower than those shown. Investment return and principal value will fluctuate, and shares, when redeemed, may be worth more or less than their original cost.

When we calculate returns for these hypothetical portfolios over our 31-year time frame, it appears that results would be better in both the balanced and growth portfolio models, which returned approximately \$79,000 and \$128,000 more, respectively, than the base-case portfolio (Figure 3).

But as Figure 3 demonstrates, these higher returns come with the risk of substantially higher volatility. The conservative portfolio weathered down-market periods much better than either the balanced or growth portfolio. Thus, while the period in question suggests that asset allocation can be a bigger driver of portfolio returns than the composition of the underlying funds, asset allocation changes carry material risks of severe declines in uncooperative markets.

3. The third driver: account rebalancing

The third factor we seek to quantify is quarterly account rebalancing. To model this regular portfolio adjustment, we will use the base-case, 4th-quartile conservative fund selection strategy described earlier. We find that rebalancing this portfolio produces less retirement wealth, but with lower volatility (Figure 4).

Ultimately, a plan is only as good as its ability to keep an investor on track, so producing steadier returns with less fluctuation may help participants stick to their plan. Having said that, the better return/risk ratio in our example does not carry a benefit in terms of absolute annualized return. Rebalancing may help returns in more challenging markets.

Figure 4. Rebalancing can help reduce risk (4th-quartile funds)

Rebalance?	Terminal wealth	Annualized return	Annualized risk	Return/risk ratio
No	\$205,551	10.5%	8.1%	1.30
Yes	\$180,872	9.8%	5.9%	1.67
	Less money	Lower returns	Less volatility	Better return/risk ratios

Data are historical and based on a hypothetical conservative asset allocation portfolio rebalanced quarterly, outlined in Section 3. Past performance is not a guarantee of future results. More recent returns may be higher or lower than those shown. Investment return and principal value will fluctuate, and shares, when redeemed, may be worth more or less than their original cost.

4. The fourth driver: deferral rates

Next and lastly, we investigate the impact of higher deferral rates on the individual's wealth accumulation. Very quickly, it becomes clear that the incremental impact of higher deferral rates can be one of the most significant drivers of long-term returns (Figure 5).

It should come as no surprise that if one saves and invests more, then one might be more likely to accumulate greater wealth. But, as Figure 5 suggests, the size of the difference in terminal wealth can be dramatic. As we dial up the individual's contribution from 3% of income to 4%, 6%, and 8%, the final balance after 31 years jumps from \$205,551 to \$274,067, \$411,101, and \$503,501, respectively. Interestingly, even a 4% deferral — which represents a 1% increase that does not take advantage of the plan's full matching contribution — would have had a wealth accumulation impact three times larger than the crystal ball fund selection strategy. Putting deferral rate changes in these terms, the performance of underlying funds, in particular, appear to become far less meaningful when compared with the impact of higher deferral rates.

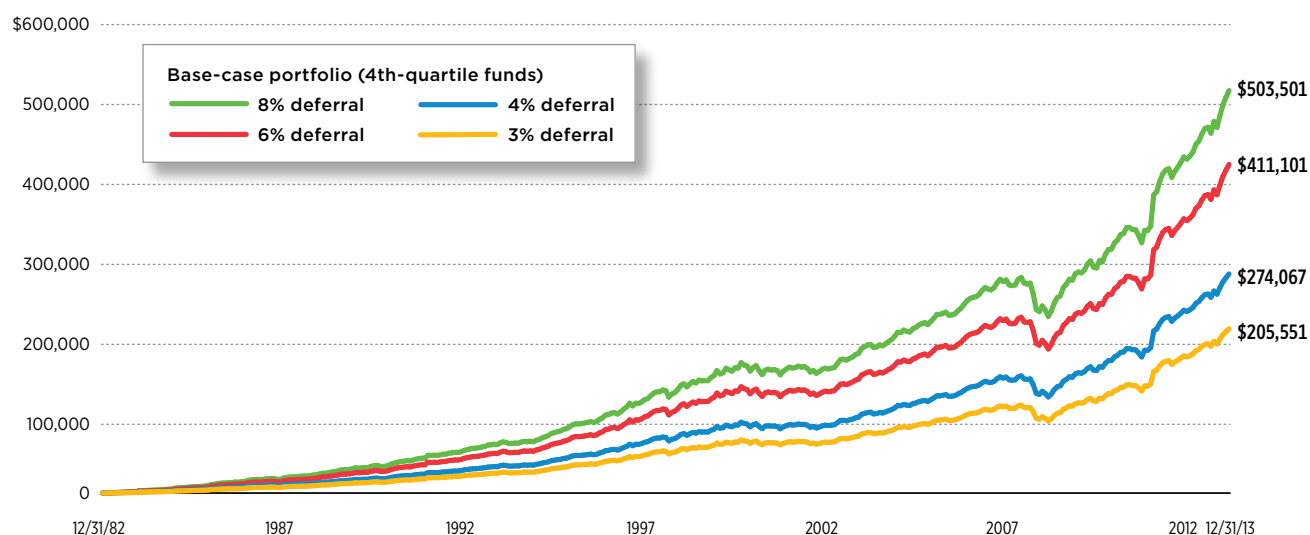
Implications for plan design and participant education

Readers may observe that the remarkable difference in wealth afforded through higher deferral rates affects the individual's portfolio only, and does not concern the overall performance of the plan. While this is true in certain respects — as we have modeled the effects of different factors on the wealth accumulation potential of an individual rather than an entire plan base — it is more important to recognize that our analysis suggests a hierarchy of priorities for plan sponsor activity.

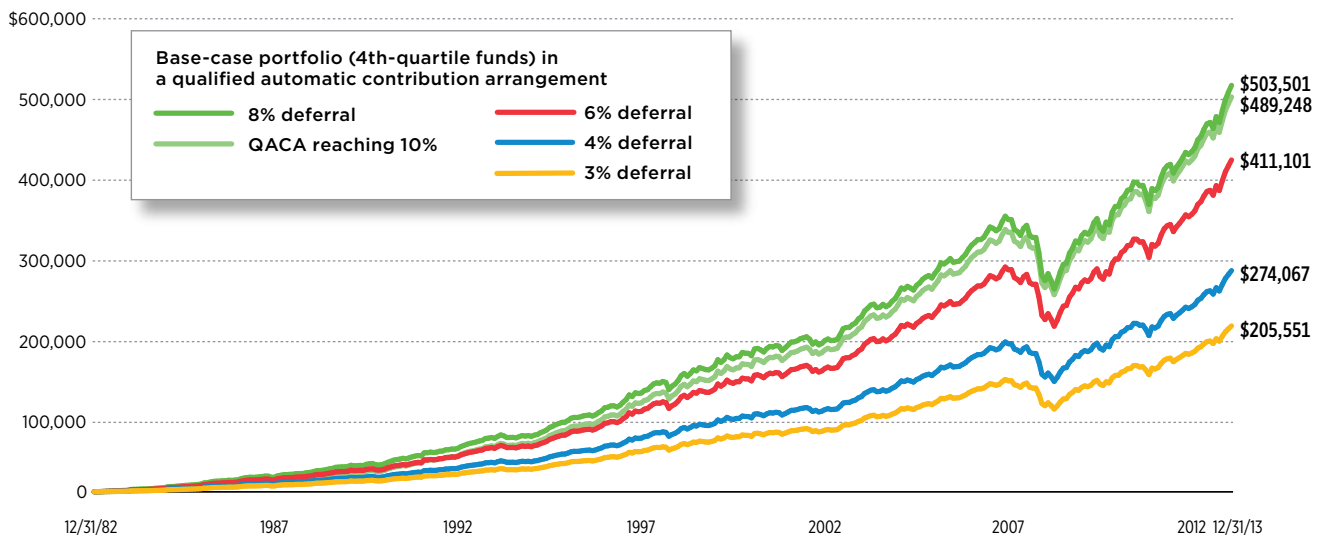
How should plan sponsors and their advisors spend their time? Should they focus on fund selection, asset allocation, rebalancing, or increasing deferral rates? After decades of experience, we now know that for the vast majority of participants, inertia rules the day.

Against this behavioral bias, our data suggest that focusing on helping eligible employees enroll and/or increase their deferrals into their DC plan is a good way to help boost wealth accumulation potential. For this reason, we feel that services such as auto-enrollment and auto-deferral increases are two critical best practices that plan sponsors should consider implementing.

Figure 5. Changing deferral rates (hypothetical portfolio)



Data are historical and based on hypothetical investment scenarios outlined in Section 4. Past performance is not a guarantee of future results. More recent returns may be higher or lower than those shown. Investment return and principal value will fluctuate, and shares, when redeemed, may be worth more or less than their original cost.

Figure 6. Auto-escalation features (hypothetical portfolio)

Data are historical. Past performance is not a guarantee of future results. More recent returns may be higher or lower than those shown. Investment return and principal value will fluctuate, and shares, when redeemed, may be worth more or less than their original cost.

Importantly, these features do not carry high fiduciary risk. Compared with the practice of offering employee education and/or advisory services in an attempt to migrate participants toward more aggressive asset mixes — activities that carry higher fiduciary risk and may require expensive or complicated communication initiatives whose potential is uncertain — a focus on higher deferral rates has a low total cost to the plan sponsor and enormous upside potential for participants.

While plan sponsors may recognize the need to increase savings, 64.7% of plans utilize automatic enrollment at a deferral rate of 3% or less. For many plan sponsors, this is an attempt to increase participation in a way that will not dramatically impact the participant's wallet. By contrast, 42.1% do not have an automatic escalation provision.²

The Pension Protection Act of 2006 introduced a Safe Harbor provision that offers a solution to this problem. As Figure 6 shows, a qualified automatic contribution arrangement (QACA) that increases an individual participant's deferral rates from 3% to 10% by one percentage point annually — and then maintains a 10% deferral rate thereafter — would have roughly the same impact as an 8% deferral rate over the 31-year time frame employed in our study. Clearly, auto-escalation features can play a vital role in helping secure substantially higher savings for plan

participants, particularly the majority of savers who have historically tended to participate passively in their plans.

Conclusion

For many years, fund performance has taken center stage in the discussion of DC plan effectiveness and how to improve it. With the present study, we hope to shift the emphasis of that discussion to deferral rates — and the ways in which plan design and employee education can be leveraged to raise deferral rates for eligible participants. The foregoing analysis is not intended to suggest that underlying fund performance is not important. Rather, it is intended to show that a number of variables are at work in determining plan effectiveness. These are:

- Deferral rates and plan design
- Asset allocation
- Rebalancing behavior
- Individual fund performance

We contend that the industry would do well to bear this hierarchy in mind when considering ways to boost retirement preparedness. As we look at the progress participants are making toward securing a better retirement savings outcome, deferral rates are one of the most important factors to stress, whether in communication to participants about how to accumulate more wealth or in restructuring DC plans for better saving and investing success.

² Source: Profit Sharing Council of America 56th Annual Survey, 2012.

You don't need a crystal ball to see a better retirement future

When it comes to helping retirement plan participants meet their savings goals, plan design can be a huge asset. Providing access to the infrastructure, tools, and financial education enhances the ability to save.

Plan sponsors can make this happen. Of many available options, encouraging higher deferral rates and ensuring a diverse allocation of investment choices can have the greatest impact.

- Of the potential plan sponsor actions analyzed in this study, the following may offer the greatest benefits
- Adding an auto-escalation feature to lift deferral rates to 10%
- Improving diversification with a balanced allocation

The impact of key plan sponsor actions on portfolio balance outcomes

		Difference from base case
Base case	\$205,551	—
3-year rotation of replacing funds	\$166,222	-\$39,329
"Crystal ball" fund selection	\$226,720	+\$21,169
Improving diversification with a balanced allocation	\$284,443	+\$78,892
Increasing deferral by 1%	\$274,067	+\$68,516
Adding an auto-escalation feature to lift deferral rates to 10%	\$489,248	+\$283,697

**Notes on methodology***

The base-case “4th-quartile” portfolio was created using the following six Lipper categories of funds: Large-Cap Growth, Large-Cap Value, Small-Cap Core, International, Corporate Bond A-rated, and Money Market. Using the criteria of “three years ending 12/31/82,” we chose funds that were at or near the 75th percentile in the Lipper universe for their respective categories. The fund would have to be in existence for the entire length of the study, and where there was more than one fund, we chose the one that is more commonly used in defined contribution plans (example, class C shares are not usually used in defined contribution plans). We held the fund throughout the length of the study, using monthly returns for our calculation.

The base-case “4th-quartile” portfolio consisted of the following funds:

Fund name	Fund category	Lipper percentile (3 years ended 12/31/82)
W&R Adv: Bond; A	Corporate Debt Funds A-rated	67
Fidelity Contrafund	Large-Cap Growth Funds	73
Dodge & Cox Stock	Large-Cap Value Funds	73
Franklin Money; A	Money Market Funds	75
T. Rowe Price SC Stk	Small-Cap Core Funds	72
Nationwide: Bail Intl E; M	International Funds	80

The “1st-quartile” portfolio was created using the following six Lipper categories of funds: Large-Cap Growth, Large-Cap Value, Small-Cap Core, International, Corporate Bond A-rated, and Money Market. Using the criteria of “three years ending 12/31/82,” we chose funds that were at or near the 25th percentile in the Lipper universe for their respective categories. The fund would have to be in existence for the entire length of the study, and where there was more than one fund, we chose the one that is more commonly used in defined contribution plans (example, class C shares are not usually used in defined contribution plans). We held the fund throughout the length of the study, using monthly returns for our calculation.

The “1st-quartile” portfolio consisted of the following funds:

Fund name	Fund category	Lipper percentile (3 years ended 12/31/82)
USAA Income; Fund	Corporate Debt Funds A-rated	17
Value Line Larger Co	Large-Cap Growth Funds	28
Neuberger LC Value; Inv	Large-Cap Value Funds	28
Pru MoneyMart Assets; A	Money Market Funds	25
Vanguard Sm-Cp Idx; Inv	Small-Cap Core Funds	29
W&R Adv: Intl Growth; A	International Funds	20

* Portfolio selection is not an offering to buy or sell any security or recommendation of a fund. The methodology is not intended as investment advice.

The “three-year rotation” portfolio was created using the following six Lipper categories of funds: Large-Cap Growth, Large-Cap Value, Small-Cap Core, International, Corporate Debt Funds A-rated, and Money Market. We created eleven separate time frames: three years ending 1982, 1985, 1988, 1991, 1994, 1997, 2000, 2003, 2006, 2009, and 2012. For each time frame, we used the criteria of “three years ending 12/31 of the above eleven years” and we chose funds that were at or near the 25th percentile in the Lipper universe for their respective categories. Where there was more than one fund, we chose the one that is more commonly used in defined contribution plans (example, class C shares are not usually used in defined contribution plans). We held the fund throughout the length of its respective time frame, and then switched to the fund that met the criteria for the next time frame. In other words, the funds rotated into 1st-quartile funds every three years.

The “three-year rotation” portfolio consisted of the following funds:

Fund category	Fund name	Three years ended on 12/31	Lipper percentile
Corporate Debt Funds A-rated	USAA Income; Fund	1982	17
	W&R Adv: Bond; A	1985	17
	W&R Adv: Bond; A	1988	17
	Vanguard Lg-Tm Inv; Inv	1991	23
	Putnam Income; A	1994	20
	W&R Adv: Bond; A	1997	23
	Munder: Bond; Y	2000	23
	Pioneer Bond; A	2003	22
	Parnassus: Fxd-Inc	2006	25
	Pioneer Bond; A	2009	25
	Putnam Income; R	2012	24
Large-Cap Growth Funds	Value Line Larger Co	1982	28
	Janus Fund; D	1985	24
	Elfun Trusts	1988	28
	Janus Fund; D	1991	23
	T. Rowe Price Gro Stk	1994	24
	Oppenheimer Cap Appr; A	1997	24
	Oppenheimer Cap Appr; Y	2000	25
	Bridges Investment Fd	2003	25
	Optimum: Lg Cp Gro; A	2006	24
	Morg Stan I: Growth; I	2009	25
	Pioneer Fndmntl Gro; A	2012	25
Large-Cap Value Funds	Neuberger LC Value; Inv	1982	28
	ING Corp Leaders	1985	25
	Dodge & Cox Stock	1988	24
	American Funds Mut; A	1991	27
	Oppenheimer: Value; A	1994	24
	Natixis: LS Value; Y	1997	25
	DWS Equity Div; A	2000	25
	DWS Lg Cap Value; A	2003	25
	Goldman: Lg Cap Val; A	2006	25
	MainStay: ICAP Eq; I	2009	25
	MainStay: I CAP Sel Eq; R1	2012	25
Money Market Funds	Pru MoneyMart Assets; A	1982	25
	Ready Assets Prime Money	1985	26
	Fidelity: Prime; Dly Mny	1988	25



Fund category	Fund name	Three years ended on 12/31	Lipper percentile
	Federated Aut Csh; Svc	1991	25
	BIF Money Fund	1994	25
	Virtus: Insgt MM; A	1997	25
	Northern Fds: Money Mkt	2000	25
	Nicholas Money Market	2003	25
Money Market Funds	HSBC: Prime MM; D	2006	25
	T. Rowe Price Prm Rsv	2009	25
	ProFunds: Money Mkt; Svc	2012	26
Small-Cap Core Funds	Vanguard Sm-Cp Idx; Inv	1982	29
	DFA US Micro Cap; I	1985	25
	Russell: U.S. Sm Cap Eq; Y	1988	22
	Russell: U.S. Sm Cap Eq; Y	1991	27
	Gabelli Eq: SC Gro; AAA	1994	26
	Glenmede: Sm Cap Eq; Adv	1997	25
	Russell: U.S. Sm Cap Eq; I	2000	25
	PNC: MltFc SCV; I	2003	25
	FMI: Common Stock	2006	25
	Target: Small Cap Val; T	2009	25
	MassMutual Sel: SCV; L	2012	25
International Funds	W&R Adv: Intl Growth; A	1982	20
	Nationwide: Bail Intl E; M	1985	25
	Fidelity Overseas	1988	27
	Fidelity Canada; Canada	1991	24
	CB International Val; A	1994	24
	Ivy: Intl Growth; A	1997	25
	Fidelity Adv Intl CA; A	2000	25
	Forester: Discovery Fd	2003	25
	WM Blair: Intl Gro; N	2006	25
	T. Rowe Price Int: Stock	2009	25
	Principal: Dvs Intl; R-5	2012	25

The “index” portfolio was created using the following market indexes for each of the respective Lipper categories:

- Russell 1000 Growth Index for Lipper Large-Cap Growth
- Russell 1000 Value Index for Lipper Large-Cap Value Russell 2000 Index for Lipper Small-Cap Blend
- MSCI EAFE Index for Lipper International
- Barclays U.S. Aggregate Bond Index for Lipper Corporate Bond A-rated
- Merrill Lynch U.S. 3-Month Treasury Bill Index for Lipper Money Market

We used monthly returns for our calculation. We assigned (deducted) an annualized fee of 0.35% for each of the indices, as a rough but fair estimate of typical management fees associated with index funds.

Merrill Lynch U.S. 3-Month Treasury Bill Index is an unmanaged index that seeks to measure the performance of U.S. Treasury bills available in the marketplace.

Barclays U.S. Aggregate Bond Index is an unmanaged index of U.S. investment-grade fixed-income securities.

MSCI EAFE Index (ND) is an unmanaged index of equity securities from developed countries in Western Europe, the Far East, and Australasia.

Russell 1000 Growth Index is an unmanaged index of those companies in the large-cap Russell 1000 Index chosen for their growth orientation.

Russell 1000 Value Index is an unmanaged index of those companies in the large-cap Russell 1000 Index chosen for their value orientation.

Russell 2000 Index is an unmanaged index of the 2,000 smallest companies in the Russell 3000 Index.

Indexes assume reinvestment of all distributions and do not account for fees. Securities and performance of a fund and an index will differ. You cannot invest directly in an index.

The “crystal ball” portfolio was created using the following six Lipper categories of funds:

Large-Cap Growth, Large-Cap Value, Small-Cap Core, International, Corporate Debt Funds A-rated, and Money Market. Based on their percentile ranking looking three years forward, we chose funds that were at or near the 25th percentile in the Lipper universe for their respective categories. Thus, in 1982, we chose funds that were at or near the 25th percentile for the three years ending in 1985. For 1985, we chose funds that were at or near the 25th percentile for the three years ending in 1988. (For the specific funds chosen, see the notes to the three-year rotation strategy.) We repeated this process for the remaining time frames: 1988, 1991, 1994, 1997, 2000, 2003, 2006, and 2009. For 2012, we chose funds that were at or near the 25th percentile in 2013 — the ending year of our study. Accordingly, these funds were:

Fund name	Fund category	Lipper percentile (1 year ended 12/31/13)
Munder: Bond; Y	Corporate Debt Funds A-rated	24
Saratoga: Lg Cap Gro; I	Large-Cap Growth Funds	25
JPMorgan: Intrpd Val; R2	Large-Cap Value Funds	25
Active Assets Money Tr	Money Market Funds	19
Columbia: SmCp Val II; R5	Small-Cap Core Funds	25
WellsFargo: Dvs Intl; I	International Funds	25

As with the three-year rotation strategy, where there was more than one fund, we chose the one that is more commonly used in defined contribution plans (example, class C shares are not usually used in defined contribution plans). We then assumed that the plan would have been able to know that a fund ended up as a 1st-quartile fund, and retroactively put it into the plan. We held the fund throughout the length of its respective time frame, and then switched to the fund that met the criteria for the next time frame. In other words, we assumed that the plan sponsor had perfect foresight — a crystal ball — in choosing funds.

Assumptions for analysis: All flows into the account occurred on the first day of each month; all rebalances occurred on the first day of each calendar quarter.

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