

THRIFT SAVINGS PLAN: LIFECYCLE FUNDS ASSET ALLOCATION - TO VS. THROUGH DESIGN ANALYSIS

FEDERAL RETIREMENT THRIFT INVESTMENT
BOARD

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Background

The TSP Lifecycle Funds (L Funds) currently follow a “To” retirement design, reaching the terminal asset allocation of 20% equities in the target maturity year (for example, the 2020 L Fund will reach its final allocation in July 2020, and remain at 20% equity thereafter). The L Funds are comprised of 5 index funds that form the core Thrift Savings Plan lineup, two funds that track the US equities market (large cap and small cap), one fund that tracks the international equities market (non-US developed equities), and two fixed income funds (core fixed income, and the G Fund, which provides the yield on intermediate to long term Treasury bonds without duration risk).

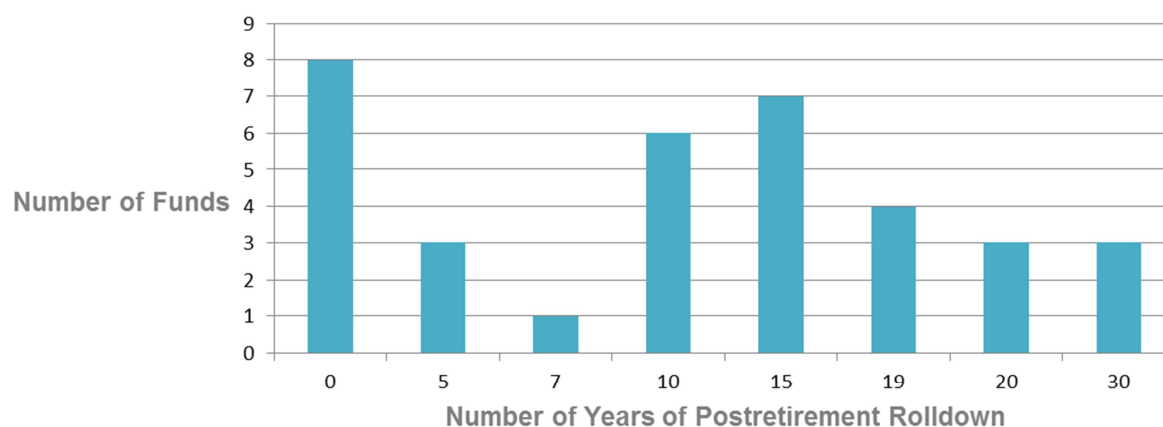
The Federal Retirement Thrift Investment Board has retained Mercer to complete an analysis exploring hypothetical L Fund asset allocation glide paths utilizing a “Through” design that reaches the terminal asset allocation after the target maturity date. These designs continue the rolldown of equity assets into fixed income through the early years of retirement. In particular, we assessed potential “Through” design alternatives that reach their terminal allocation 5, 10, and 15 years after retirement. The first three alternatives reviewed maintain the current glide path shape and shift the allocations by 5, 10, or 15 years. The fourth alternative modifies the shape of the glide path, utilizing the “More Equity” scenario from the 2016 Lifecycle Fund Asset Allocation study with an extended roll down period to reach the terminal asset allocation 10 years beyond the target maturity date. In addition to modeling participant outcomes for these four alternative glide paths to compare against the current L Funds, we discuss the current market with respect to target date fund design (based on Mercer’s quarterly survey of off-the-shelf target date fund providers), prevalence of “To” vs. “Through” designs in the market, and typical postretirement rolldown periods.

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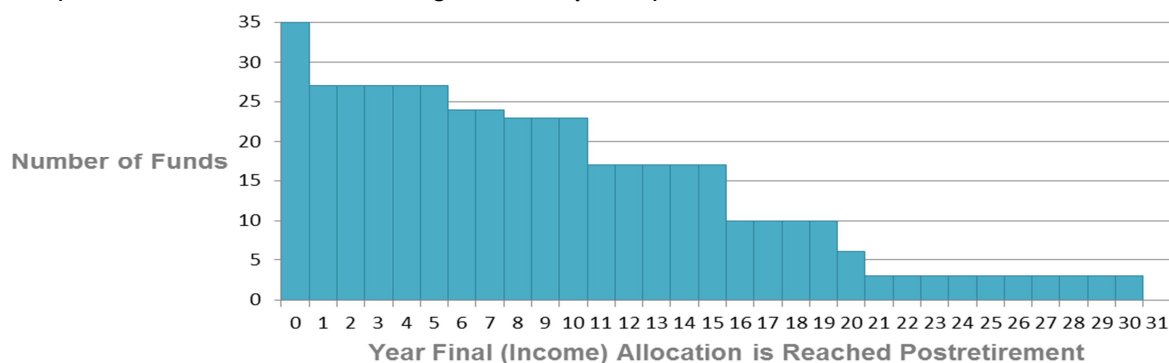
Market Overview

Over the past few years the market has been moving towards a “Through” design approach as a lifetime investing concept has permeated the industry. The concept is that retirement can stretch 30+ years and therefore early retirees (5-10 years postretirement) in particular benefit from additional return in the early retirement years when their time horizon (life expectancy) is relatively long, while late retirees (15+ years postretirement) have less need for excess return as their time horizon is shorter and spending may decline as they become less active in later retirement.

As of Q1 2016 the Mercer TDF survey included 35 fund series with different asset allocations, 27 of which feature “Through” retirement designs (approximately $\frac{3}{4}$ of funds). The postretirement rolldown period varies by provider, with 10 and 15 year postretirement rolldown periods most prevalent among off-the-shelf funds.

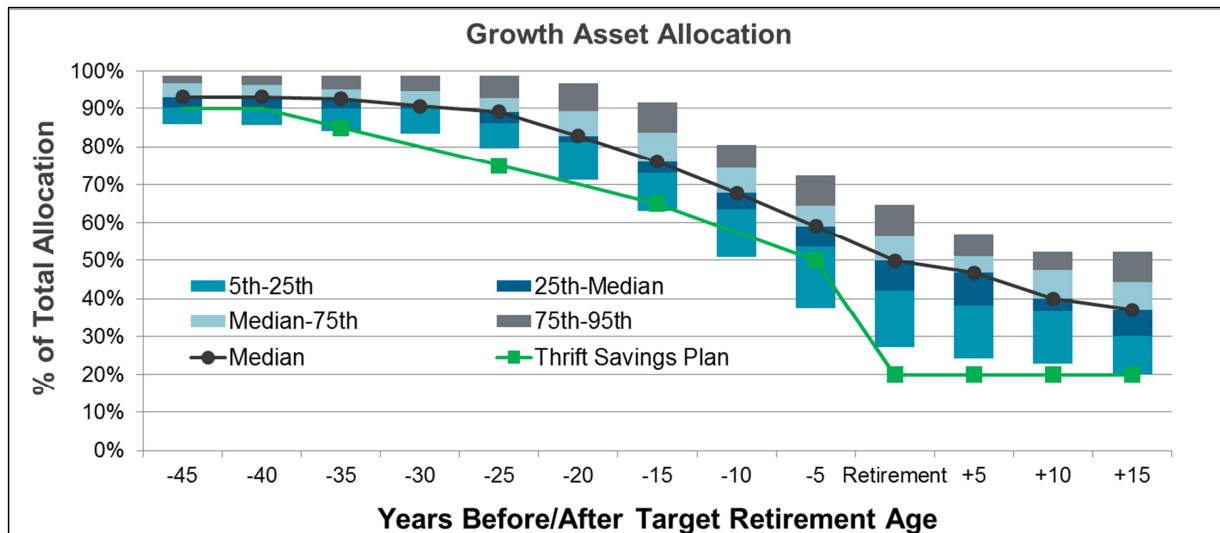


Including the “To” designs that reach their ultimate allocation at the target maturity year, the following chart shows the percentage of funds that continue to rolldown as the postretirement period extends. Of the 35 total fund series, 24 go over 5 years postretirement, 17 go over 10 years post-retirement and 10 funds go over 15 years postretirement.



Comparing the growth asset allocation of the L Funds to the universe of funds included in the Mercer survey, we note that due to the relatively conservative “To” design, the L Fund growth

allocation declines relatively early, with the 20% growth allocation reached at the target maturity year. In contrast, the median across the off-the-shelf providers is nearly 50% growth in the 2015 fund (1 year beyond target maturity).



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Participant Characteristics

As part of the analysis, we collected information on how participants draw money out of the Thrift Savings Plan. We focused on participants age 55 or older who terminated employment over a three year period (calendar 2013 through 2015) and included elections through the end of 2016.

Generally, if a large majority of participants are taking full distributions from the plan at retirement, it may lead to a determination that a “To” design, either aggressive or conservative, is the best fit. If most participants taking distributions are electing a cash withdrawal (as opposed to rollovers), a conservative “To” design is likely the best fit whereas if most participants taking a distribution elect rollovers, a more aggressive “To” design could be used, since they are likely to remain invested in equities. For example, a market study of asset allocation in Individual Retirement Accounts (IRA) by the Employee Benefits Research Institute from 2011 covering over 11 million individuals showed an average equity allocation of approximately 32% for individuals age 65 or older¹. A subsequent study, in 2015, showed equity allocation among rollover IRAs had increased (the age-group breakdown for rollover IRAs was not separated out in the 2015 study)². Therefore, we believe significant equity exposure at retirement can still be appropriate if most withdrawals are occurring via rollover. A majority of participants remaining invested in the plan (fully or partially) may indicate a “Through” design is worthwhile.

The table below summarizes the data collected for Thrift Savings Plan participants:

Age Band	55-59	60-64	65-69	Total
Participant count	94,000	105,000	54,000	253,000
Remain fully in plan	36%	33%	30%	33%
Partial w/d	8%	6%	5%	6%
Installment (incl.w/Partial w/d)	10%	11%	14%	11%
Total remaining in plan	54%	49%	49%	51%
Full w/d rollover	20%	25%	29%	24%
Total remaining invested	74%	75%	77%	75%
Annuity	0%	1%	1%	1%
Full w/d cash	22%	22%	20%	21%
Other	3%	2%	2%	3%
Total	100%	100%	100%	100%

§ Over 1/3 of all participants under the age of 65 do not take any distribution from the plan

¹ EBRI Study: https://www.ebri.org/pdf/notespdf/EBRI_Notes_05_May-11.IRA.pdf

² EBRI Study: https://www.ebri.org/pdf/notespdf/EBRI_Notes_09_Sept15_WBS-IRAs.pdf

- § Over time participants many take partial distributions and/or installment distributions from their assets
- § Overall approximately half of participants have assets remaining in the plan
- § Of those taking a full withdrawal, just over half rollover their assets, and they very likely continue investing those assets

There is a significant change in distribution behavior for over age 70 participants, although the number of participants in this cohort is smaller. A much larger percentage of this group elects annuity or installment payments. With installment payments, a portion of the assets will remain invested in the Thrift Savings Plan.

Age Band	Total 55-69	70+
Participant count	253,000	15,000
Remain fully in plan	33%	<1%
Partial w/d	6%	<1%
Installment (incl.w/Partial w/d)	11%	33%
Total remaining in plan	51%	34%
Full w/d rollover	24%	31%
Total remaining invested	75%	65%
Annuity	1%	9%
Full w/d cash	21%	24%
Other	3%	2%
Total	100%	100%

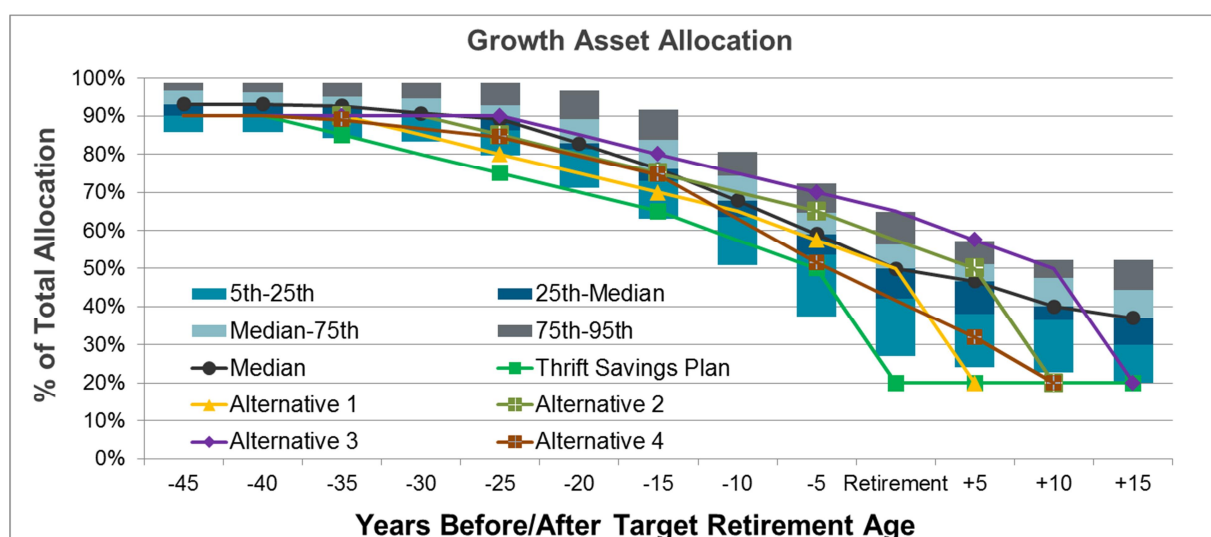
A “Through” design would require at least one, and possibly two to three, additional L Fund vintages due to the need to maintain funds over a longer rolldown period. This analysis suggests a “Through” design may be worthwhile for the plan since a significant portion of participants remain invested, at least partially (including those who take partial distributions or installment payments). In addition, since over half of the participants taking a full withdrawal from the plan roll the assets over, maintaining significant equity exposure in the years approaching retirement does not create excessive risk. Most participants are either remaining in the Thrift Savings Plan for a number of years postretirement or remaining invested through a rollover of their balance. The operational cost of maintaining additional L Fund vintages should be reviewed prior to implementing a “Through” design.

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Glide Path Alternatives and Results

Mercer has modeled four alternative “Through” designs for the L Funds. The first three alternatives were created by using the same glide path except moving the terminal asset allocation 5, 10, and 15 years postretirement. The fourth alternative asset allocation was created based upon prior work completed by Mercer (the 2016 L Funds Asset Allocation Study) – we took the current glide path asset allocation and added 5% growth assets to the 2050 and 2020 funds, added 10% growth assets to the 2040 and 2030 funds (i.e. the “More Equity” scenario in that study), and extended the postretirement rolldown to reach the terminal growth asset allocation of 20% by 10 years post-retirement.

The first three alternatives will show the impact of adjusting the terminal asset allocation point and the fourth alternative was created to be similar in curvature to the current glide path but slowly reach the terminal asset allocation at 10 years postretirement.



Modeling Results

We projected participant outcomes across 1,000 simulated economic scenarios for each glide path alternative, utilizing a representative participant assumed to retire at age 61 for each target date fund maturity. Participant demographics and assumptions are consistent with those used in the 2016 L Funds Asset Allocation Study.

We focus on the following outcomes:

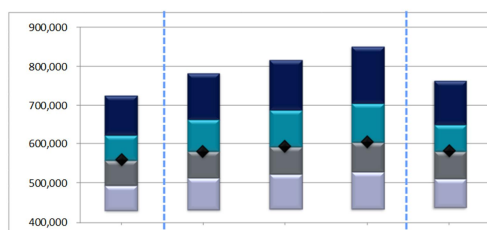
- Projected account balance at retirement
- Projected income replacement ratio at retirement
- Postretirement drawdown age of TSP assets assuming a combined budget (with DB and Social Security) of 80% of final salary (growing with inflation)

- Probability of depleting TSP assets by age 80, age 90, and over assumed life expectancy (based on the Retired Pensioners 2014 Mortality Table, adjusted for projected future mortality improvements with scale MP-2015)
- Volatility in the years leading to retirement – probability of loss in account balance in the final two years leading into retirement

Participant Retiring in 24 Years (e.g. Age 37)

2040 Fund

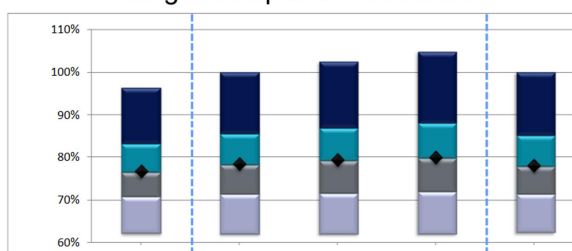
Range of Real Account Balances



	Current	Alternative 1	Alternative 2	Alternative 3	Alternative 4
95 th	728	785	819	854	767
75 th	625	664	692	708	652
50 th	562	583	595	606	583
25 th	496	516	525	532	514
5 th	432	434	437	436	439

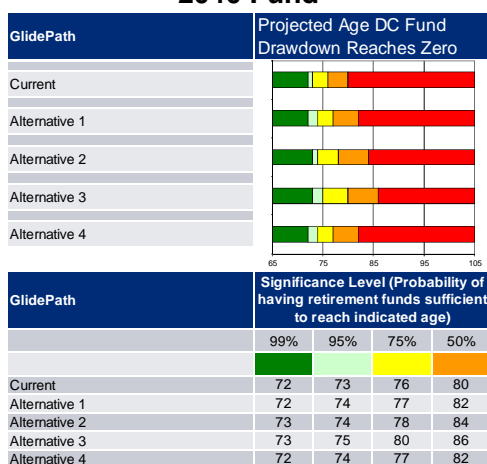
2040 Fund

Range of Replacement Ratios

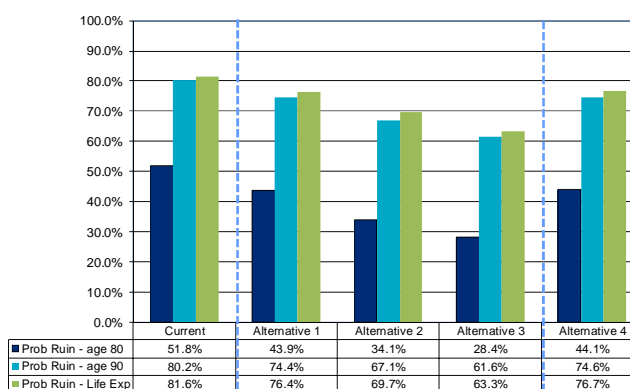


	Current	Alternative 1	Alternative 2	Alternative 3	Alternative 4
95 th	97%	100%	103%	105%	100%
75 th	83%	86%	87%	88%	85%
50 th	77%	78%	79%	80%	78%
25 th	71%	71%	72%	72%	71%
5 th	62%	62%	62%	62%	62%

2040 Fund



2040 Fund

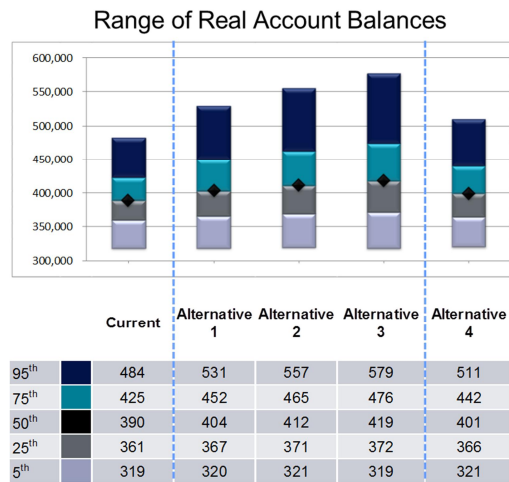


Probability of Depleting DC Assets

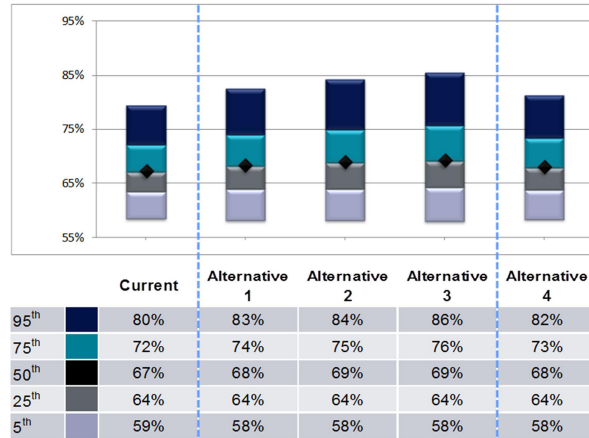
Key findings:

- Higher growth allocation throughout pre-retirement period produces higher balances across all percentiles (1% to 8% increase)
- Alternative 1 and 4 produce similar results at median with slightly different glide path shapes; differential in median drawdown age 2 years
- Alternatives 2 and 3 are more aggressive, particularly in the years approaching target retirement; differential in median drawdown age 4 to 6 years

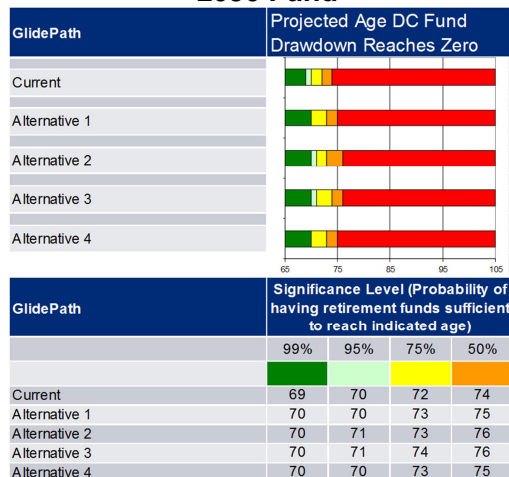
Participant Retiring in 14 Years (e.g. Age 47) 2030 Fund



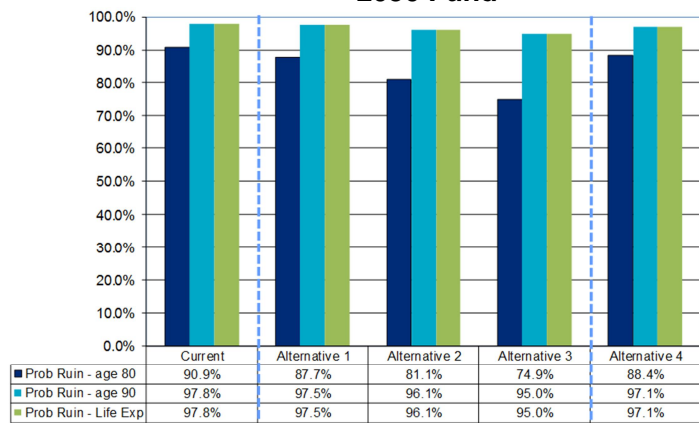
2030 Fund Range of Replacement Ratios



2030 Fund



2030 Fund



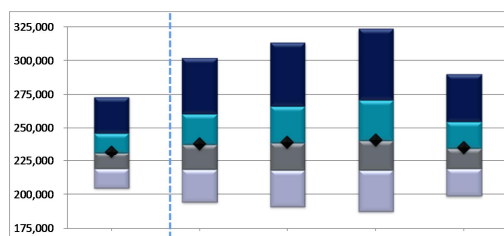
Probability of Depleting DC Assets

Key findings:

- Higher growth allocation throughout pre-retirement period produces higher balances across all percentiles, although difference is slightly smaller than 2040 Fund (0% to 8% increase)
- Differential in median drawdown age 1 to 2 years

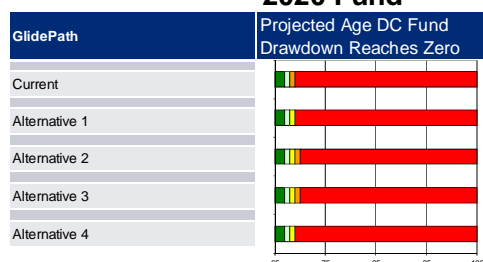
Participant Retiring in 4 Years (e.g. Age 57) 2020 Fund

Range of Real Account Balances



	Current	Alternative 1	Alternative 2	Alternative 3	Alternative 4
95 th	274	303	314	324	291
75 th	247	261	267	271	256
50 th	232	238	240	241	236
25 th	220	219	219	219	220
5 th	205	195	192	188	199

2020 Fund



GlidePath	Significance Level (Probability of having retirement funds sufficient to reach indicated age)			
	99%	95%	75%	50%
Current	67	68	68	69
Alternative 1	67	68	69	69
Alternative 2	67	68	69	70
Alternative 3	67	68	69	70
Alternative 4	67	68	69	69

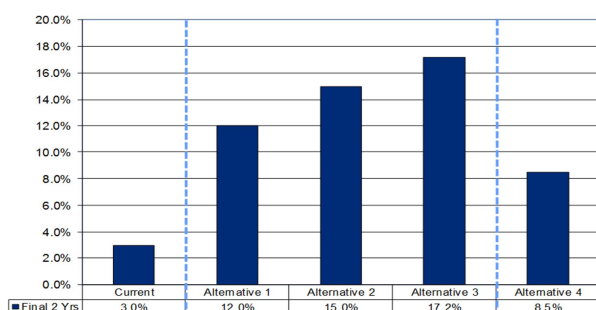
Key Findings:

- Due to close proximity to retirement added equity will increase median account balances but at the trade-off of lower 5th percentile balances
- In addition the projected age depletion of account balances is mostly unchanged (0 to 1 year differential)
- There is less added value to adjusting the 2020 fund with increased risk

The results for the 2040 and 2030 participants imply that more risk yields better results over the long term. There is additional volatility near retirement, but the risk of outliving assets is reduced. To the extent participants are remaining invested (either within the TSP or outside via rollover), the short-term volatility is less impactful.

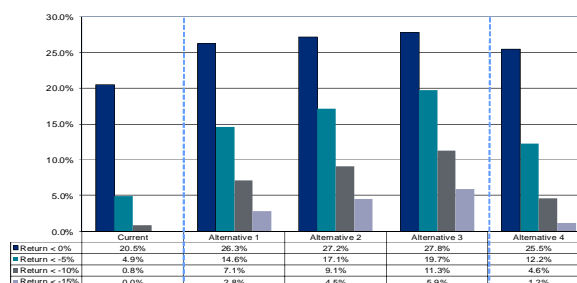
The current conservative “To” design results in lower risk of loss in the final two years than the “Through” design alternatives. Alternative 4, due to the modified glide path shape, has less of an increase in the volatility approaching retirement than Alternatives 1, 2, and 3. For example, for the 2030 Fund, the probability of loss in the final two years from Alternative 4 is 3.5%, 6.5%, and 8.7% lower than the other three alternatives, respectively. The picture is similar for the other fund maturities, although the magnitudes vary by fund.

2030 Fund



Probability of Loss in Final Two Years (Real)

2030 Fund



Probability of Investment Loss Final 2 years Pre-Retirement

For the 2020 Fund, with a relatively short time horizon, we find that the impact on participant outcomes of the alternative “Through” designs is much smaller. Since these participants are closer to retirement, a possible phased approach to a “Through” design for the L Funds could be used to retain the existing rolldown schedule for the 2020 Fund, while shifting to a “Through” design for the 2030, 2040, and 2050 Funds.

While the modeling generally shows improvement in projected outcomes with a “Through” design, the asset allocation is only one of the factors driving participant outcomes. Improving savings rates and retirement age decisions have a large impact, with less of the risk tradeoff inherent with additional equity exposure. For example, we modeled the current design with an assumed age 62 retirement instead of age 61, and a sample of results is shown below for the 2040 fund.

2040 Fund Age 61 Retirement						2040 Fund Age 62 Retirement					
Range of Real Account Balances						Range of Real Account Balances					
	Current	Alternative 1	Alternative 2	Alternative 3	Alternative 4		Current				
95 th	728	785	819	854	767	95 th	771				
75 th	625	664	692	708	652	75 th	655				
50 th	562	583	595	606	583	50 th	591				
25 th	496	516	525	532	514	25 th	528				
5 th	432	434	437	436	439	5 th	455				

Age 61 Retirement						Age 62 Retirement					
GlidePath	Significance Level (Probability of having retirement funds sufficient to reach indicated age)					GlidePath	Significance Level (Probability of having retirement funds sufficient to reach indicated age)				
	99%	95%	75%	50%			99%	95%	75%	50%	
Current	72	73	76	80		Current	72	75	80	88	
Alternative 1	72	74	77	82							
Alternative 2	73	74	78	84							
Alternative 3	73	75	80	86							
Alternative 4	72	74	77	82							

Key Findings:

- Although investment allocation has an impact on outcomes, choosing to retire later has a larger impact on projected drawdown age for this sample participant due to additional contributions, an additional year of investment returns when the participant’s balance is high, and shortening the post-retirement period

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Conclusion

The current “To” retirement design for the TSP L Funds, with a relatively conservative Income Fund, effectively manages the volatility of returns approaching the target retirement date and supports good retirement outcomes for plan participants. The “Through” retirement design alternatives take on additional volatility in the years around retirement, but they provide potential long-term benefits in terms of projected account balances, replacement ratios, and postretirement drawdown age. A “Through” design allows for additional equity allocation in the years approaching retirement and the early postretirement years, while the Income Fund can remain relatively conservative. In contrast, a similar increase in equity allocation at retirement with a “To” design would necessitate a more aggressive Income Fund.

In our survey of off-the-shelf providers, we find that “Through” designs are more prevalent, with the median postretirement rolldown period lasting 10 years. Analysis of TSP distribution data for participants age 55 and over shows that many participants remain at least partially invested in the Thrift Savings Plan postretirement and would have the opportunity to benefit from a “Through” design.

Balancing the tradeoffs we see in the modeling results, we find that shifting to a “Through” design is favorable. We recommend moving to a 10 year “through” retirement design for the 2030 and longer vintages. While alternative 2 produces more improvement in projected balance and drawdown age, it significantly increases risk in the late career and early retirement years; therefore we recommend Alternative 4 as it provides adequate improvement to long-term potential outcomes and better manages volatility near retirement.

For participants currently invested in the 2020 vintage, there is less potential impact on participant outcomes due to the shorter time horizon. In addition, a change in their investment profile may be more disruptive due to their close proximity to the terminal asset allocation. Therefore, we recommend retaining the current rolldown schedule for the 2020 Fund to provide a phased approach to implementing a “Through” design.

Prior to implementing a “Through” design, we recommend additional analysis of potential operational costs associated with maintaining L Fund vintages over a longer rolldown period.



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