FEDERAL RETIREMENT THRIFT INVESTMENT BOARD
77K Street, NE Washington, DC 20002

THRIFT SAVINGS PLAN

September 13, 2018

MEMORANDUM FOR EXECUTIVE DIRECTOR RAVINDRA DEO

FROM: SEAN MCCAFFREY Sm
CHIEF INVESTMENT OFFICER

SUBJECT: LIFECYCLE FUNDS 2018 ANNUAL ASSET ALLOCATION REVIEW BY AON HEWITT INVESTMENT CONSULTING

SUMMARY

This memorandum summarizes the Office of Investments' (OI) comments on the recently concluded Lifecycle Funds (L Funds) Annual Asset Allocation Review conducted by Aon Hewitt Investment Consulting (AHIC). In summary, OI sees benefits, as highlighted by AHIC, in transitioning the Funds to a long term higher stock asset allocation profile over time and increasing international stock as a portion of the stock mix while maintaining a "to" approach to glide path construction.

OI engaged AHIC to examine possibilities for alternative L Fund glide paths that might provide better financial outcomes for participants. These glide paths include:

- Parallel changes in stock across all of the L Funds (e.g., an additional 5% allocation to stock in all funds)
- Changes to limits on certain allocations, such as the percentage of stock that can be invested in non-U.S. stock
- Transitional glide paths, in which unique glide paths are generated for each cohort (e.g., the glide path for an L 2040 participant and an L 2050 participant will not necessarily be the same)
- Temporary freezes in the stock/bond asset allocations at existing levels, in which the L 2030, L 2040, and L 2050 Funds remain unchanged until they intercept a new proposed glide path for the forthcoming L 2060 Fund
- Institution of a "through" approach rather than a "to" approach, meaning that the glide paths would move to their terminal point asset mixes of stock and bond investments at dates some number of years after retirement rather than coincident with it
- Combinations of these changes

AHIC performed analysis to determine the risks and benefits of these alternatives and identified most favorable "through" and "to" designs.

We have considered this analysis as well as other factors and have concluded that risk/return profiles support the following changes that are denoted as "Transitional A" in AHIC's analysis:

1. Increase the share of stock in the L Income Fund's asset allocation from its current 20% to a future allocation of 30% over a period of approximately 10 years.
2. Modify the glide path of the L 2020 Fund, which will still roll into the L Income Fund in the year 2020, to accommodate the rise in stock in the L Income Fund.
3. Temporarily freeze the current allocations of stock and bond investments in the L 2030, L 2040, and L 2050 Funds until the glide paths intercept the new glide path for the forthcoming L 2060 Fund, effectively making use of AHIC's suggested transitional approach. As it is currently envisioned by AHIC, the L 2060 Fund's glide path will consist of 99% stock until age 35, an increase over the current glide path's 90% stock starting point. Although the exact specifications of this new glide path will not be determined until its inception, we anticipate that the final form of the glide path will closely resemble AHIC's proposal. If the new L 2060 glide path is constructed as proposed, the freeze periods will be approximately 6 years for the L 2030 Fund, 10 years for L 2040 Fund, and 14 years for L 2050 Fund, based on the analysis as of the end of June 2018. Final freeze periods will be calculated once a beginning transition date is set.
4. Maintain a "to" approach in all Lifecycle Funds.
5. Increase non-U.S. stock share of all stock from 30% to 35% immediately in all Lifecycle Funds.

BACKGROUND

OI Lifecycle Fund Policy and Lifecycle Fund Asset Allocation Procedures direct that "the Agency will conduct a comprehensive review of the Lifecycle Fund asset allocations at least annually, unless exception is given, or as economic conditions require." Further, "the TSP Lifecycle Funds are designed to be a long-term, risk-efficient strategy, and the risk and return objectives of the funds are intended to be consistent with an overall replacement rate (including defined benefit and Social Security) of a substantial portion of pre-retirement income," according to procedures.[1]

AHIC developed a set of capital market assumptions for items such as economic growth, inflation, interest rates, as well as the TSP F, C, S, and I Funds' expected returns, volatilities, and correlations. The firm examined the L Funds' current placement relative to the efficient

---

[1] This policy is consistent with FERSA which states that the Board must design TSP investment policies that provide for prudent investments suitable for accumulating funds for payment of retirement income." 5 U.S.C. § 8475 (1).

frontier. It considered TSP characteristics and population demographics for FERS employees, especially L Fund investors. In collaboration with OI, it developed a set of glide paths over which it conducted stochastic analysis and compared predicted outcomes to those predicted for the current glide paths. Finally, AHIC compiled glide paths from several target date funds in its defined contribution universe to serve as a basis for comparison. AHIC used all of these inputs to develop the Lifecycle Fund glide path alternatives for consideration by the TSP.

DEMOGRAPHIC DATA AND ASSUMPTIONS

This year's study featured two significant changes in demographic assumptions.

First was the adoption of the salary scale assumption published by OPM in its actuarial valuation. The assumption in previous L Funds Annual Reviews was for the investment consultant to use a flat annual rate of increase based on the premise that participants spend their entire careers in one pay grade, moving through the steps of that pay grade on a particular timeline. The new assumption, on the other hand, accounts for moves both across and within pay grades. The result is that newer (generally younger) employees – the ones more likely to be promoted to a higher pay grade – receive higher annual increases than more tenured (generally older) employees, who are more likely to be making merely step increases, if anything. Using this assumption allows us to take advantage of OPM's expertise in FERS demographics and brings our method of projecting TSP account balances into alignment with OPM's method of projecting the FERS defined benefit.

The second significant change in demographic assumptions was an increase in the age of first withdrawal from 62 to 63. This change is supported by the latest edition of the withdrawal data analysis that contributed to last year's increase from 61 to 62. The model participant profiles used in AHIC's analysis are summaries of cohorts that are based on years until first withdrawal. Although the age of first withdrawal increased from 62 to 63, the retirement age assumption remained at 62. This led to an adjustment in the cohort definitions, as noted in the following tables:

	2017 Study					
	Assumed birth date between		**Assumed retirement date between**		**Assumed withdrawal date between**	
Fund	**January 1**	**December 31**	**January 1**	**December 31**	**January 1**	**December 31**
L 2050	1983	1992	2045	2054	2045	2054
L 2040	1973	1982	2035	2044	2035	2044
L 2030	1963	1972	2025	2034	2025	2034
L 2020	1953	1962	2015	2024	2015	2024

Fund	2018 Study					
	Assumed birth date between		Assumed retirement date between		Assumed withdrawal date between	
	January 1	December 31	January 1	December 31	January 1	December 31
L 2050	1982	1991	2044	2053	2045	2054
L 2040	1972	1981	2034	2043	2035	2044
L 2030	1962	1971	2024	2033	2025	2034
L 2020	1952	1961	2014	2023	2015	2024

The one-year gap between retirement age and withdrawal age, which allows an extra year of asset returns before withdrawals and spreads those withdrawals over one fewer year of the participant's post-retirement life, leads to improved financial outcomes. This change in definitions means that any new auto-enrollments into the L Funds will now hit the minimum risk, minimum stock portfolio at an average age of 63 once this change is completely implemented, vs. existing auto-enrolled participants who will hit the minimum risk, minimum stock portfolio at an average age of 62. This assumption change has operational implications. Certain programming within the TSP's recordkeeping system must be adjusted to account for the new birth years associated with each L Fund. Similarly, the written notices that are sent to new participants contain references to the age assumption and therefore must be modified. Because of these requirements, we note that the implementation of the assumption change may not coincide with that of the proposed glide path changes, which will be less labor-intensive by comparison.

Because of these two changes, we caution against direct comparisons between the replacement ratios and future inflation-adjusted account balances generated in this year's study and those from prior studies. This is particularly true for the youngest participants, whose salaries (and therefore contributions) were most affected by the change in salary scale. Furthermore, comparisons between model participants are clouded by the fact that the model does not account for any retirement savings outside of the three-legged stool of the TSP, the FERS defined benefit, and Social Security. This equates to an assumption that participants will have spent their entire careers in the Federal workforce, which we know is an unrealistic assumption given that the median hire age for new Federal employees has hovered between 33 and 37 in recent years. In reality, there are participants in the L 2020 cohort who have only been Federal employees for a few years and therefore have small TSP balances that bring down the cohort's average. By contrast, the model participant in the L 2050 Fund will experience a full career of contributions and market returns, leading to a significantly larger account balance at retirement. For this reason, we also caution against comparisons across L Funds, even within the same Annual Review year. However, the comparisons that are the basis of this study – comparing proposed glide paths by Fund and within a given year – are valid.

ANALYSIS OF OUTCOMES

First, we note that the outcomes of AHIC's simulations pass our checks for reasonableness. As expected, glide paths with higher stock allocations show greater dispersion of replacement ratios and account balances as well as higher probabilities of negative returns in the two years before withdrawal. Similarly, the dispersion of outcomes increases with time to maturity (e.g., the L 2020 Fund's simulated outcomes are very tightly bunched whereas L 2050's show more variance).

In general, the simulated outcomes reveal very few opportunities for easy gains (increases in return without increases in risk, or decreases in risk while maintaining the same return). Furthermore, the scale of the risk/return trade-offs is relatively small. For the L 2050 Fund, which is most sensitive to changes in the glide path, the decreases in the 5th percentile replacement ratio (i.e., risk) are under 100 basis points and the increases in the median replacement ratio (i.e., return) are under 250 basis points. For the L 2040 model participant, which is more representative of an average FERS employee, the impacts are more muted: a gain of 150 basis points in the median replacement ratio at the cost of a 60 basis point decrease in the 5th percentile replacement ratio. This suggests that the current glide path leaves little room for enhancing outcomes.

One of AHIC's tasks was to compare the L Funds to other target date funds throughout the defined contribution industry. In particular, this comparison focused on both the growth allocation, including stock, and the proportion of stock dedicated to international holdings. In both cases, AHIC's report notes that the TSP has taken a more conservative approach than others in the defined contribution universe. The TSP's current glide path is positioned well below the rest of the defined contribution universe in terms of allocation to growth asset classes. Likewise, most of the target date funds examined by AHIC have larger holdings of international stock, with some approaching the global market share of roughly 52% U.S. and 48% non-U.S. These differences alone, however, are not sufficient cause for making a change. The TSP does not see its L Funds as competing with other defined contribution plan sponsors' target date fund offerings because the TSP's approach has been tailored to the needs of Federal employees, not to any perceived peers.

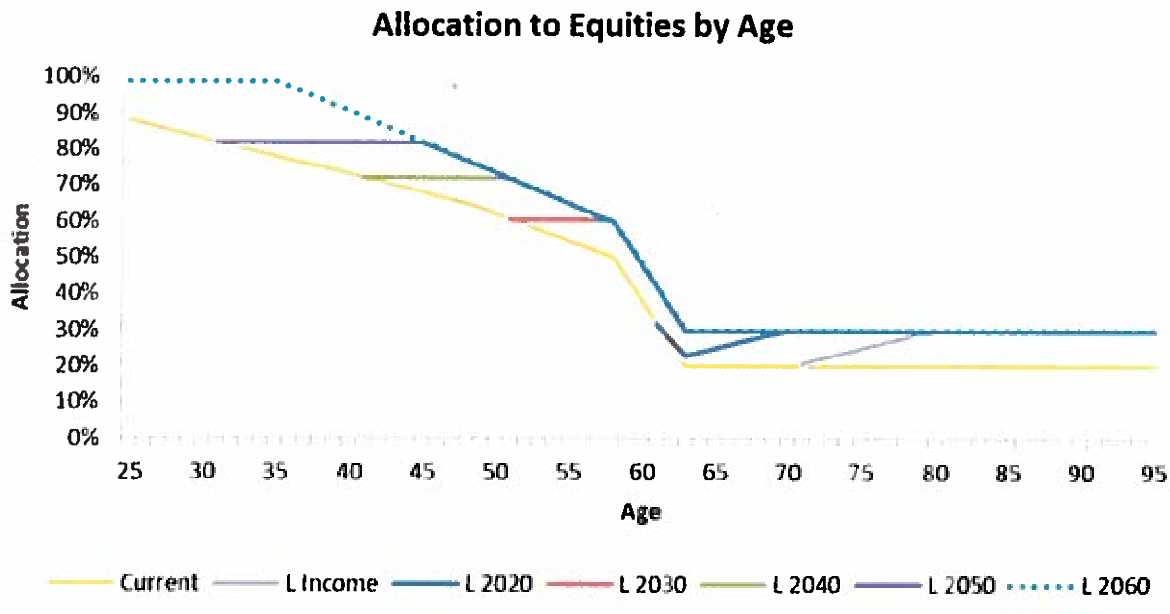
Nevertheless, we believe the simulated outcomes identify two ways to improve the L Funds: increasing the overall stock exposure and increasing the share of the stock allocation that is dedicated to international stock. AHIC's analysis demonstrates that higher growth allocations, meaning stock in general and international stock as a portion of overall stock, will increase the median replacement ratios and reduce the likelihood of depleting account balances. For many of the proposed glide paths, we believe these benefits outweigh the higher risks, which take the form of lower 5th percentile replacement ratios and higher probabilities of loss in the two years before withdrawal. As noted above, the differences between these risk/return measures are relatively small and therefore do not overwhelmingly identify the best course of action. As a result, we also considered current levels of participant satisfaction, expectations for stock risk exposure, and likely success of communication as additional factors. It seems reasonable to ask, "Which new glide path(s) may be understood clearly and may transition participants and beneficiaries toward better risk-adjusted financial outcomes while maintaining their confidence and level of comfort as they approach retirement?" This question highlighted three concerns:

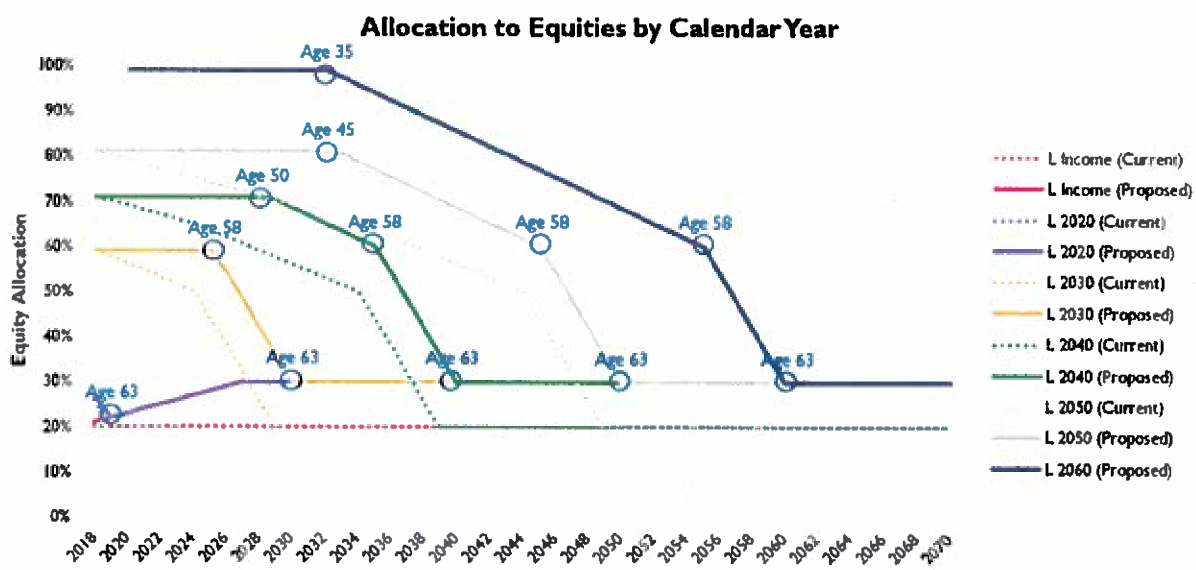
1. To vs. through: Moving from a "to" to a "through" approach represents a significant communications challenge at any time, but doing it at this point in the L Fund cycle would raise the complex issue of how to handle the L 2020 Fund and other current and proposed Funds. Furthermore, looming demographic and behavioral changes due to the Blended Retirement System (BRS) and forthcoming changes to withdrawal options may significantly affect the merits of "to" and "through" (see additional remarks below). For these reasons, we prefer to maintain the "to" approach for now.
    a. BRS: As we gather more data on the behavior of Uniformed Services participants covered under the BRS, there may be differences that are stark enough to cause us to alter the default fund in which BRS participants are enrolled. There are three potential large differences in the demographics of these two participant bodies.
        i. The FERS participants rely on a three-pronged retirement plan, with a component made up of Social Security, a defined benefit component (the FERS annuity), and the TSP. A small percentage, less than 15% based on current data, of BRS participants will have a defined benefit component. The majority will rely on Social Security and the TSP, plus any benefits they accrue once they leave the Uniformed Services. This makes their risk profile very different from that of the typical FERS participant. This might mean, all other things being equal, that a BRS participant should have a shorter duration L Fund with a lower risk than a FERS participant of the same age.
        ii. BRS participants might have very different contribution rates than FERS employees. This data will not be available for a few years, but this does make the choice of default L Fund more important.
        iii. The BRS participants might have very different withdrawal patterns than FERS employees. This data will not be known for many decades, but could significantly influence which L Fund is appropriate for this segment of participants.
    b. Operational complexity: We currently have five L Funds. We are already committed to moving to ten L Funds in 2020, ranging from the L 2025 to the L 2065 and the L Income Fund in 2020. Changing the structure of the target date funds to a "through" approach will mean that the L 2025 will not merge into the L Income Fund in 2025, but will exist for some number of years after that. This means that the L Fund family will grow as new funds are added every five years, but old ones do not merge into the L Income fund for a few years.
    c. Forthcoming changes to withdrawal options: As required by the TSP Modernization Act of 2017, the current restrictions on withdrawals will be relaxed in 2019. The net effects of these changes are yet to be determined. Participants might use their newfound freedom to make withdrawals earlier and

more often. Conversely, participants who felt the old rules forced them into taking withdrawals earlier than desired might respond by postponing those withdrawals. Given that the age of first withdrawal is a critical element in the design of the glide paths and in the subsequent analysis of outcomes, we believe it would be risky to change from "to" to "through" when we may be on the verge of experiencing significant changes in withdrawal behavior.

2. Sudden increases: Some of the proposed glide paths call for immediate increases in the allocation to stock. Although we have faith that the long-term impact would be beneficial, we are concerned that these sudden changes, especially if they occur around the time of poor market returns, could generate anxiety and dissatisfaction among participants. Therefore, we prefer to phase in changes over time. This also gives us time to ensure that the changes are well understood by participants, and they have the ability to change L Funds should they so desire. Should they choose to accept the higher allocations, we can be comfortable that they have provided implicit informed consent.
3. Final two years before retirement: In addition to looking at replacement ratios under unfavorable market conditions, we are also sensitive to the likelihood of losses in the two years before retirement. Such an outcome could significantly disrupt a participant's retirement planning. Although eliminating this risk would be overly conservative, the desire to keep the probability in check argues in favor of limiting stock exposure within reason in the years before retirement.

Having established this framework for evaluating the proposed glide paths, we conclude that the transitional, "to" approach employing a stock freeze and an increase in international stock exposure (Transitional A in AHIC's report) best fits the criteria. The figures below depict this approach. The first figure, taken from Aon, shows stock allocations by age and adjusted to the new assumption for first withdrawal date for an apples-to-apples comparison; the second figure from OI shows the proposed new glide paths against unadjusted current glide paths, though, it has been modified to show stock allocations by calendar year.





COSTS

It is appropriate to consider identifiable incremental costs in any decision to move forward with making changes. We acknowledge three:

1. Agency administrative costs: We do not believe that the proposed changes will incur any material administrative costs. The initial work required to set up new glide paths in the TSP's financial management system is relatively minor. The recurring work associated with day-to-day

activity is also minor and would be required regardless of whether the glide paths were changed.

2. Investment manager fees: Manager fees can generally be thought of as a weighted average of those fees associated with the individual G, F, C, S, and I Funds. The new asset allocations proposed here will therefore result in new fees for the L Funds. Using the 2017 fees from the July 2018 edition of the *TSP Highlights* newsletter as a guide, we estimate the following changes to annual manager fees:
    - L Income Fund: Increase of 0.00977 basis point
    - L 2020 Fund: Increase of 0.00414 basis point
    - L 2030 Fund: Increase of 0.00742 basis point
    - L 2040 Fund: Increase of 0.00783 basis point
    - L 2050 Fund: Increase of 0.00749 basis point

   We deem these fee increases to be negligible.
3. Transition costs: These costs result from the transactions required for the L Funds to achieve their new allocations at the initiation of transition, namely, selling portions of the C and S Funds and buying additional assets for the I Fund. Having inquired with our vendors, we believe these costs would be immaterial, especially if the transactions are spread over multiple days, given normal market liquidity. Under preliminary three- and six-day trade execution plans generated, the one-time impacts on the net asset values are projected to be less than one basis point for the C, S, and I Funds.

FUTURE CONSIDERATIONS

The course of action that we are recommending will involve a multi-year transition from the current glide paths to the new ones. Our future L Funds studies will serve to re-underwrite and confirm the end state for that transition and to ensure that the pace of the transition is appropriate. More specifically, we will keep three considerations at the forefront:

1. Demographics: The L 2060 glide path shown in AHIC's presentation is a place-holder that represents the best estimate of the most appropriate future glide path. It will remain notional until we have actual demographic data for those in the L 2060 cohort. It should be noted that the L 2060 cohort will be dominated by Uniformed Services (US) personnel covered under the Blended Retirement System (BRS), representing a profile that is starkly different from that of FERS participants. Specifically, the US personnel have lower basic pay, shorter careers, and NO defined benefit plan (except for the small percentage who stay for the 20 year vesting). They are also considerably younger than their FERS counterparts, which means they could make up over 80% of the L 2060 population for the first five years of the Fund's existence. Over time, however, US participants will separate and new, older FERS employees will arrive, causing the proportions to tilt in favor of FERS. As we prepare to launch L 2060, we will need to

decide how, if at all, to incorporate US participants into the modeling. Regardless of whether/how US participants are included, the construction of the L 2060 glide path will determine the durations of the freeze periods for the L 2030, L 2040, and L 2050 glide paths, which are currently projected to be approximately 6 years, 10 years, and 14 years, respectively.

2. Impact of additional withdrawals: By November 2019, participants will enjoy greater flexibility in making withdrawals. The impact of that flexibility is difficult to predict. To the extent that greater flexibility encourages some participants to stay with the TSP, we might see a delay in first withdrawal. Conversely, the flexibility might entice others to make a withdrawal they otherwise would have deferred. We will monitor the data to determine whether there are changes in withdrawal behavior.
3. Five-year increments: OI is sponsoring the project that will add the L 2025, L 2035, L 2045, L 2055, L 2060, and L 2065 Funds in the year 2020. The current plan calls for having L 2060 and L 2065 use the same glide path (the one which the L 2030, L 2040, and L 2050 will ultimately intercept), while the other new funds will interpolate between the existing ten-year funds. When possible, we will study demographic data to validate this plan.

CLOSING

OI submits for your consideration three proposals:

1. AHIC presented an analysis of several "through" and "to" glide path alternatives in its report that involved primarily increasing stock exposures overall, modifying higher the international stock exposure, and changing glide path terminal points. It pointed to considerations of risk and reward in the resulting outcomes that may enhance TSP participants' chances for reaching retirement goals and it identified most favorable case "through" and "to" designs. OI has examined this work and recommends that the Agency adopt AHIC's set of transitional "to" glide paths, denoted as "Transitional A," effective as soon as practicable.

2. Based on its analysis of participants' withdrawal behavior, OI recommends changing the age of first withdrawal assumption from 62 to 63, thereby changing the rules by which auto-enrolled participants are assigned to L Funds. The implementation of this change will require re-programming certain parts of the TSP's recordkeeping system as well as modification of the written notices that are mailed to new participants. As a result, these changes may not be implemented at the same time as the glide path changes described above, which will require a comparatively lighter programming workload.

3. In light of OI's current planning for the mid-year 2020 introduction of the L Fund 2060 as well as an enhancement to the overall L Funds line-up with new Funds completing five-year increments, OI recommends not conducting a 2019 L Funds study and instead allowing for OI's attention in 2019 to be devoted to studies and planning that support the new 2020 Fund introductions. In other words, the Agency would forego the asset allocation study in 2019 for 2019 consideration and focus its attention on a late 2019/beginning 2020 study for 2020 consideration and implementation prior to the launch of the L 2060 and the L 2025, L 2035, L 2045, L 2055 and L 2065 Funds in July of 2020.

Concur Ravindra Deo 13 Sept 2018.

Non-concur N.A.

Other N.A.