

2021 L Funds Asset Allocation Review

Presented By
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May 26, 2021



Thrift Savings Plan

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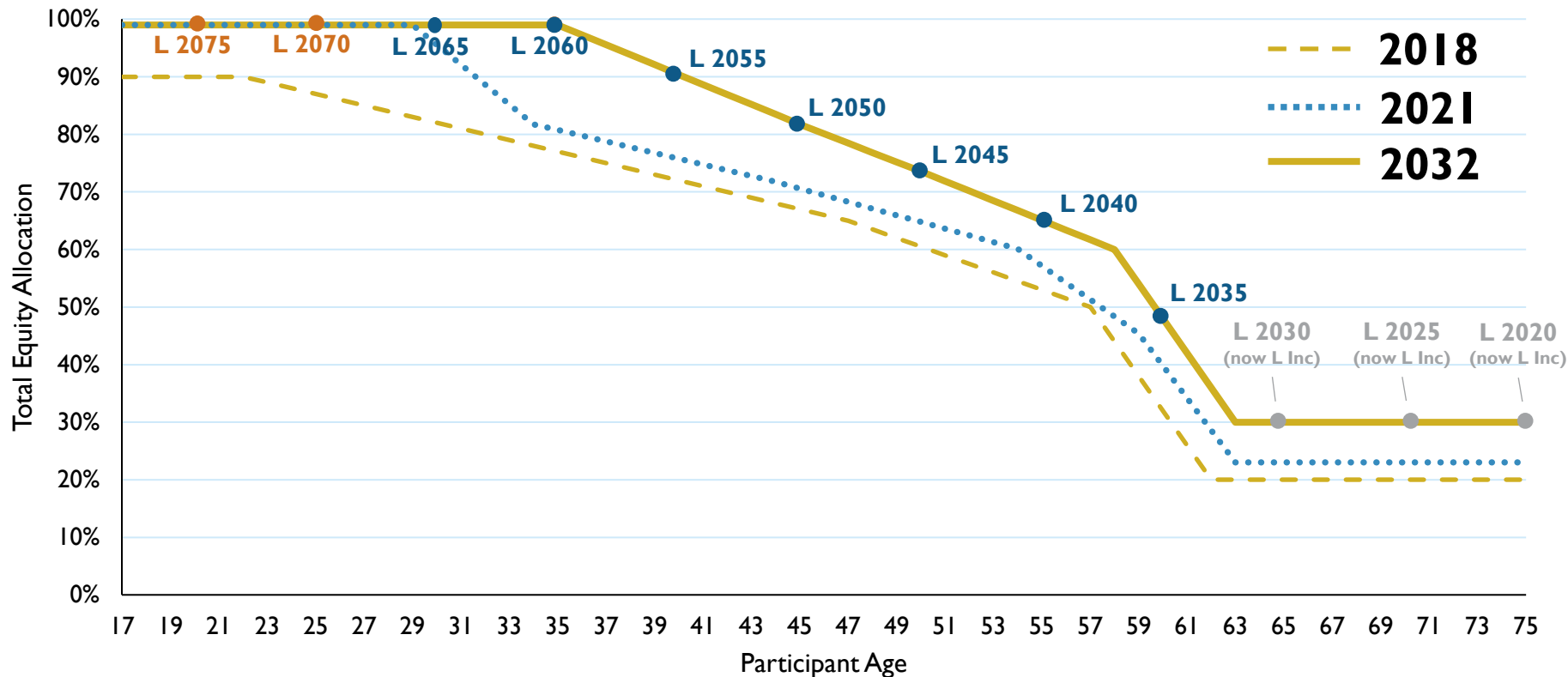


L Funds Asset Allocation Review

- Annual review conducted in collaboration with investment consultant
- Explore ways to improve outcomes without unreasonably increasing risk



Glide Path Transition (2018-2032)



Presentation by Aon





Thrift Savings Plan – Board Presentation Lifecycle Fund Asset Allocation

May 2021

Investment advice and consulting services provided by Aon Investments USA Inc.

Nothing in this document should be construed as legal or investment advice. Please consult with your independent professional for any such advice.

Calculations based on the manager provided target asset allocations and the custom 10-year capital market assumptions for the L Fund study as of Q1 2021 unless otherwise noted.

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Executive Summary

Executive Summary

Scope of Study

The FRTIB hired Aon to complete the 2021 annual L Funds glide path asset allocation study.

Retirement Adequacy

The desired objective is for the FRTIB to create and provide a series of L Funds such that an “average participant” in those L Funds, in combination with the FERS defined benefit plan and Social Security, will be projected to have sufficient assets to maintain a reasonable standard of living throughout retirement.

Glide Path Risk Level

The TSP’s participant demographics suggest the current risk level of the L Funds’ glide path and the projected path forward are reasonable to accomplish the FRTIB investment objectives.

Investment Structure

In this study, Aon evaluated several possible L Fund investment structure changes. At the completion of this 2021 study, Aon believes there is not a clear alternative investment structure that would meaningfully improve retirement adequacy for TSP participants invested in the L Funds. Aon’s opinion is that it is prudent for the TSP to continue down the scheduled path with the intended rolldown for this calendar year.



Glide Paths Modeled

Glide Paths Modeled

Current Glide Path Asset Allocations as of July 2021

Asset Allocation	L 2065	L 2060	L 2055	L 2050	L 2045	L 2040	L 2035	L 2030	L 2025	L Income
C Fund	49.6%	49.6%	49.6%	41.0%	38.7%	36.6%	33.8%	31.0%	23.6%	12.1%
S Fund	14.8%	14.8%	14.8%	12.1%	11.2%	10.1%	9.1%	8.1%	5.9%	2.9%
I Fund	34.7%	34.7%	34.7%	28.6%	26.9%	25.1%	23.1%	21.0%	15.9%	8.1%
F Fund	0.6%	0.6%	0.5%	7.9%	8.1%	7.6%	7.4%	6.6%	6.2%	5.8%
G Fund	0.4%	0.4%	0.5%	10.3%	15.1%	20.7%	26.7%	33.2%	48.4%	71.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Key Characteristics	L 2065	L 2060	L 2055	L 2050	L 2045	L 2040	L 2035	L 2030	L 2025	L Income
Years to Maturity	44	39	34	29	24	19	14	9	4	0
Equity Percentage	99.0%	99.0%	99.0%	81.8%	76.8%	71.8%	65.9%	60.1%	45.4%	23.0%
Non-U.S. / Total Equity	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%
SMID / Total U.S. Equity	22.9%	22.9%	22.9%	22.8%	22.4%	21.6%	21.1%	20.7%	20.1%	19.2%
G Fund / Total Fixed Income	36.0%	44.0%	50.0%	56.5%	65.0%	73.1%	78.3%	83.4%	88.6%	92.5%

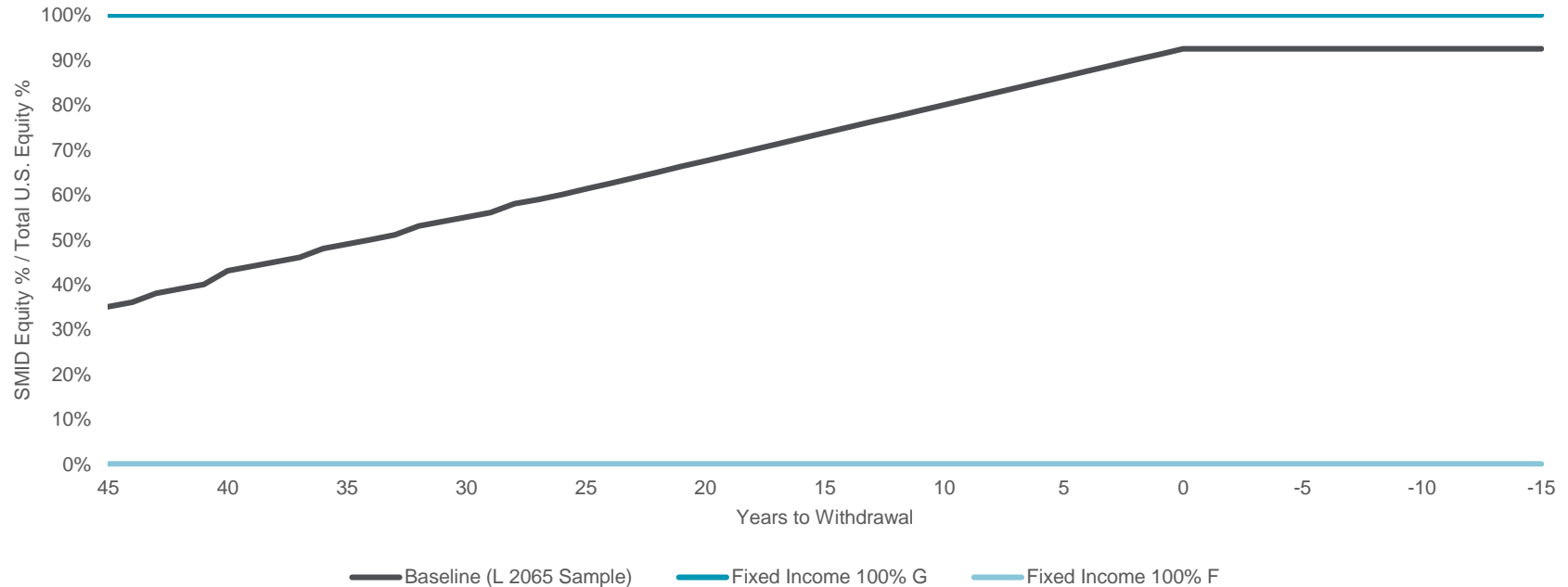
Glide Paths Modeled

Alternate Glide Path Scenarios

Scenario	Description	Equity Percentage	G Fund / Total Fixed Income	SMID / Total U.S. Equity	Int'l / Total Equity
1	Current Glide Path	Transitional glide path with targets of: <ul style="list-style-type: none"> 99% equity at age 35 60% equity at age 58 30% equity at age 63 	Upward trajectory to 92.5% by target year	Transition to 16% by 2025	35%
2	Move to Ultimate GP	Move immediately to target equity allocation	Upward trajectory to 92.5% by target year	Transition to 16% by 2025	35%
3	Fixed Income 100% G	Same as current	Immediately move all fixed income to G Fund	Transition to 16% by 2025	35%
4	Fixed Income 100% F	Same as current	Immediately move all fixed income to F Fund	Transition to 16% by 2025	35%
5	Transition to 20% SMID/U.S.	Same as current	Upward trajectory to 92.5% by target year	Transition to 20% by 2025	35%
6	Increase I to 40% of Equity	Same as current	Upward trajectory to 92.5% by target year	Transition to 16% by 2025	40%
7	De-risk 5 Years Sooner	Transitional glide path with targets of: <ul style="list-style-type: none"> 99% equity at age 30 60% equity at age 58 30% equity at age 63 	Upward trajectory to 92.5% by target year	Transition to 16% by 2025	35%
8	De-risk 5 Years Later	Transitional glide path with targets of: <ul style="list-style-type: none"> 99% equity at age 40 60% equity at age 58 30% equity at age 63 	Upward trajectory to 92.5% by target year	Transition to 16% by 2025	35%
9	10-year Through Glide Path	Transitional glide path with targets of: <ul style="list-style-type: none"> 99% equity at age 35 60% equity at age 58 50% equity at age 63 30% equity at age 73 	Upward trajectory to 92.5% by target year	Transition to 16% by 2025	35%

Glide Paths Modeled

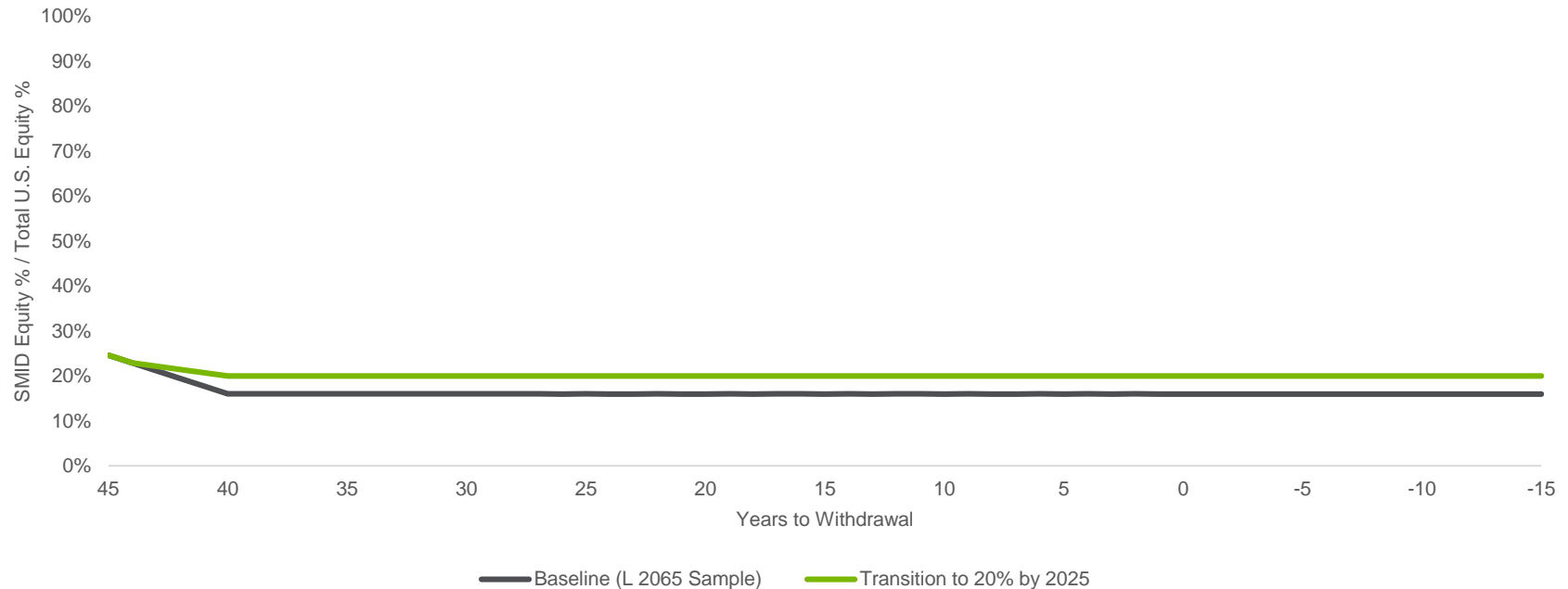
Alternate Glide Paths—G Fund as Percentage of Total Fixed Income



- **Current** L Funds have varying allocations to the G Fund as a percentage of total fixed income, with a long-term trajectory from 35% at early ages to 92.5% by the target year
- **Scenario 3** immediately moves the entire fixed income allocation to the G Fund
- **Scenario 4** immediately moves the entire fixed income allocation to the F Fund

Glide Paths Modeled

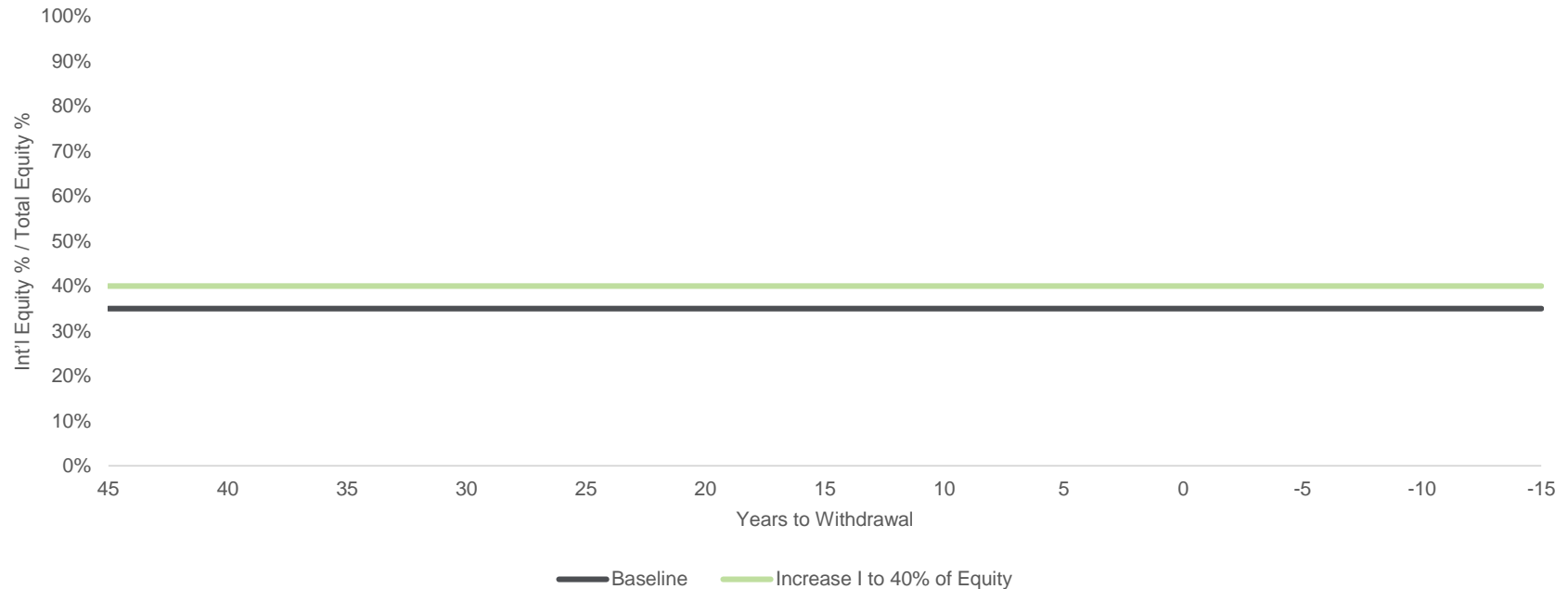
Alternate Glide Paths—Small/Mid Cap Equity vs. Total U.S. Equity



- **Current** L Funds have allocations to the S Fund ranging from 20% to 25% of total U.S. equity, transitioning linearly to 16% by 2025
- **Scenario 5** adjusts the target ratio to 20% of total U.S. equity by 2025

Glide Paths Modeled

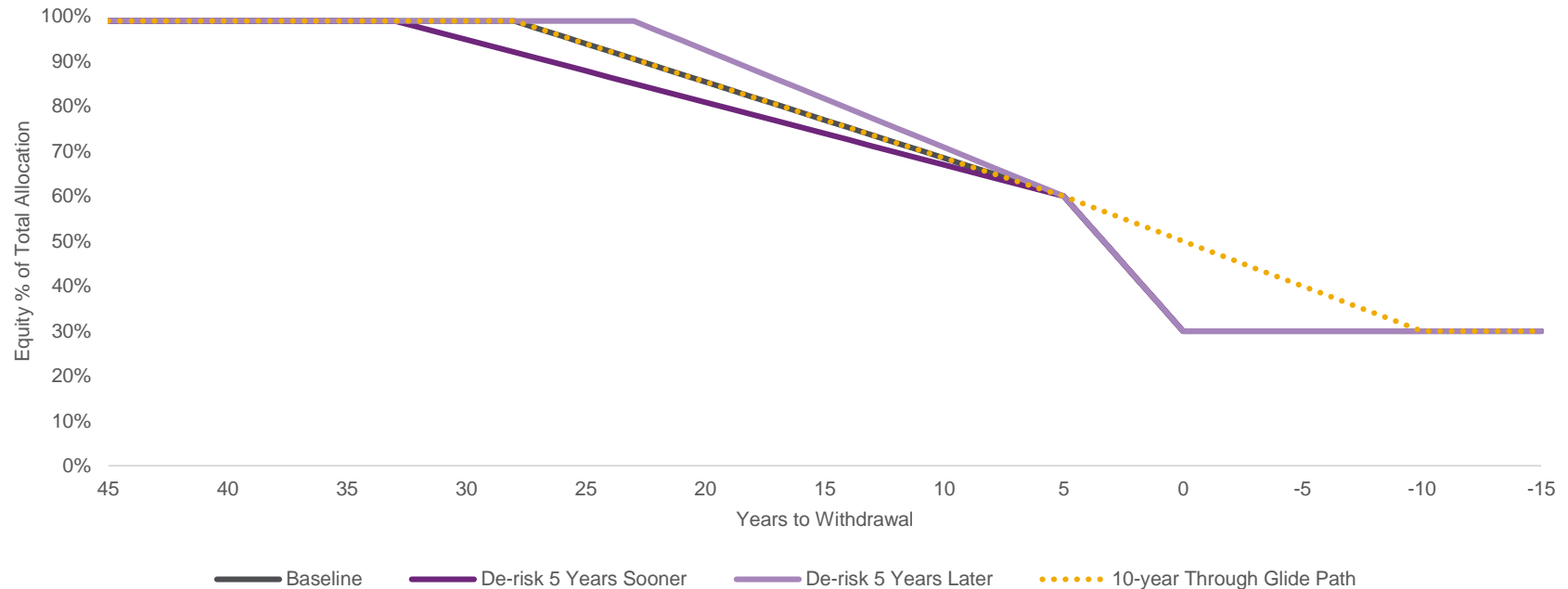
Alternate Glide Paths—Non-U.S. Equity vs. Total Equity



- **Current** glide path has a non-U.S. equity proportion of 35% of total equity at all ages
- **Scenario 6** immediately increases the non-U.S. equity proportion to 40% of total equity at all ages (no transition)

Glide Paths Modeled

Alternate Glide Paths—Equity Allocation



- **Current** glide paths follow a transition to the baseline glide path depicted above
 - 90% equity at age 35, 60% equity at age 58, 30% equity at age 63 (assumed withdrawal age)
 - Level transition: equity allocation in each fund remains constant over time until it matches the target glide path
- **Scenario 2** assumes no transition: equity allocation immediately moves to target glide path
- **Scenario 7** adjusts the first de-risking age from 35 to 30 (5 years sooner), with transition to new glide path
- **Scenario 8** adjusts the first de-risking age from 35 to 40 (5 years later), with transition to new glide path
- **Scenario 9** increases the equity allocation at age 63, and continues de-risking until age 73, with transition



Summary Analysis

Expected Return and Risk Assumptions (10-Year)

Geometric Return	2021 Study	2020 Study ¹	2018 Study ²
C Fund: Large Cap U.S. Equity	5.6%	6.1%	6.2%
S Fund: Small/Mid Cap U.S. Equity	5.8%	6.7%	6.3%
I Fund: Non-U.S. Equity ³	6.6%	7.3%	7.7%
F Fund: Core Fixed Income	1.6%	2.9%	3.3%
G Fund: Government Yield	2.0%	3.1%	3.0%
Inflation	2.1%	2.2%	2.3%
Standard Deviation	2021 Study	2020 Study	2018 Study
C Fund: Large Cap U.S. Equity	17.0%	18.0%	17.0%
S Fund: Small/Mid Cap U.S. Equity	23.0%	20.6%	23.0%
I Fund: Non-U.S. Equity	20.0%	20.8%	20.5%
F Fund: Core Fixed Income	4.0%	5.3%	4.0%
G Fund: Government Yield	1.0%	1.2%	1.0%
Inflation	1.0%	1.7%	1.5%
Yield History	2/24/21	9/30/19	2/28/18
Bloomberg Barclays US Aggregate	1.39%	2.26%	3.15%
10-year Treasury	1.38%	1.68%	2.87%

¹ 2020 study assumptions based on the Mercer report "Thrift Savings Plan: Lifecycle Fund Asset Allocation – Board Summary" dated March 23, 2020. Assumptions are based on a 20-year horizon.

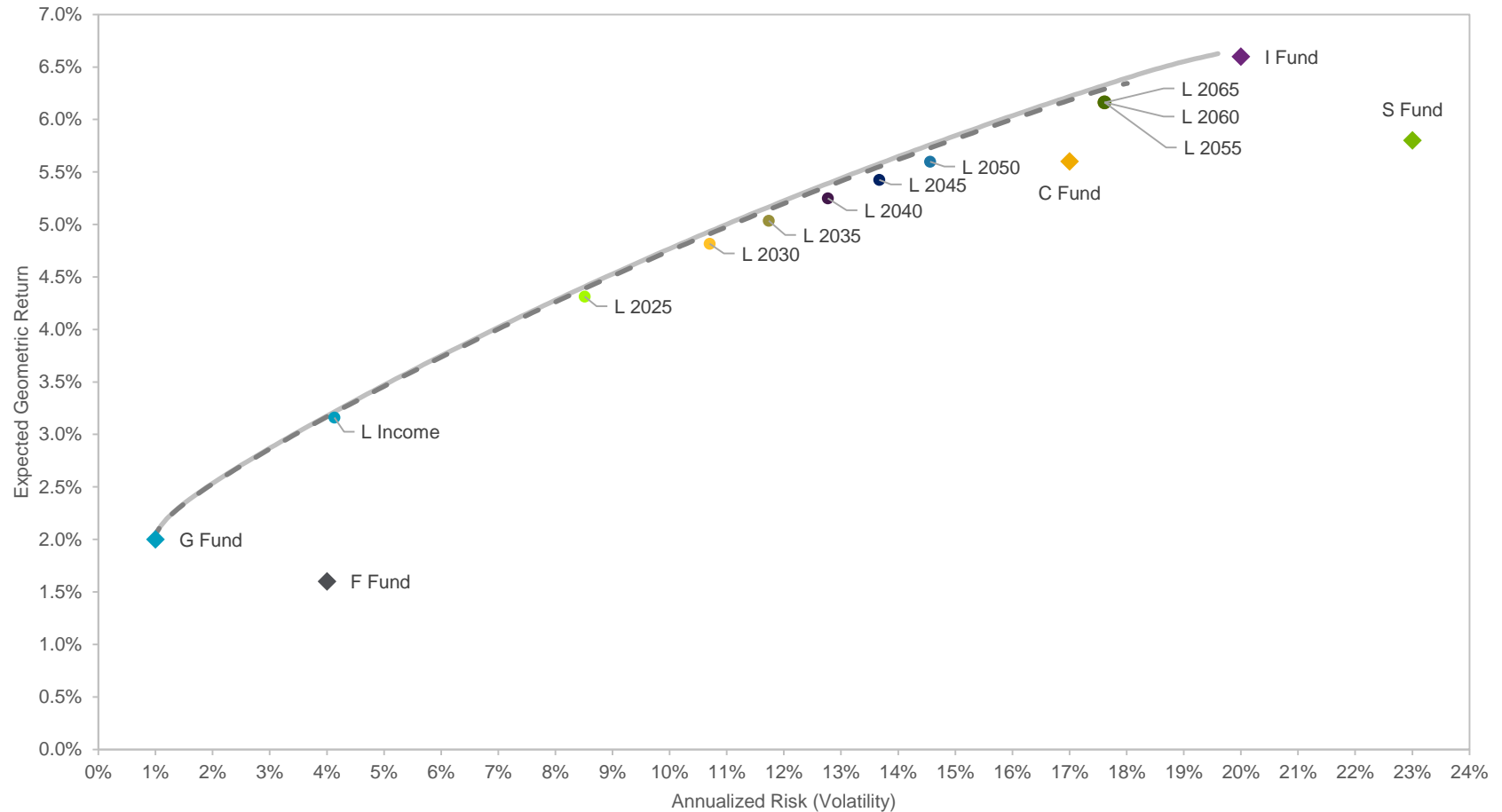
² 2018 study assumptions based on the Aon report "Thrift Savings Plan – Full Work Product, Lifecycle Fund Asset Allocation" dated September 17, 2018. Assumptions are based on a 10-year horizon.

³ In 2018 and 2020, the I Fund benchmark was assumed to be the MSCI ACWI ex USA IMI index. For the 2021 study, the benchmark is assumed to be the MSCI EAFE index.

- Based on Aon 2021 Q1 10-year capital market assumptions (as of December 31, 2020), adjusted for changes in yields through February 24, 2021
- The G Fund is assumed to earn the yield on 9-year duration Treasury bonds. Currently, the duration on all outstanding Treasury bonds with 4 or more years to maturity is about 9 years.
- The G Fund has a slightly higher expected return than the F Fund. The price impact of a long-term rise in rates is expected to offset the higher current yield of the F Fund.

Efficient Frontier

Based on 10-Year Forward Looking Assumptions



Demographic Profile for L 2040 Fund

- Demographic profiles were provided by FRTIB officials
- Data is based on actual December 31, 2020 data and rolled forward to July 1, 2021 by FRTIB officials
- Employee deferral rates are extrapolated from the characteristics provided by cohort
- Employer contributions are assumed to be 5% of pay
- All participants are assumed to earn a Social Security benefit based on pay projected to retirement and regressed to date of hire using the salary merit scale assumptions
- All participants are assumed to earn a defined benefit pension equivalent to 30% of final pay
- Salary merit scale assumptions are based on schedules from the Civil Service Retirement and Disability Fund Annual Report for the fiscal year ending September 30, 2019
 - Assumed blend of 80% non-postal, 20% postal workforce
 - Select and ultimate table based on age and service
 - Net of inflation
- Age-based rates are as of the sample ages shown

Fund	L 2040		
Assumed Hire Age	35		
Age as of 7/1/2021	44		
Retirement Age	62		
Age at First Withdrawal	63		
Annual Salary as of 7/1/2021	\$90,979		
DC Balance as of 7/1/2021	\$127,821		
Deferral Rate as of 7/1/2021	7.18%		
Contribution and Salary Scale Rates at Sample Ages	Employee Deferral	Employer Contrib.	Salary Merit Scale
25	-	-	-
30	-	-	-
35	-	-	-
40	-	-	-
45	7.27%	5.00%	1.99%
50	7.87%	5.00%	1.65%
55	9.07%	5.00%	1.04%
60	9.86%	5.00%	0.88%
62+	0.00%	0.00%	0.00%

Summary Results

L 2040 Fund

Account Balance ¹ & Replacement Ratio ² at First Withdrawal	Current	Move to Ultimate GP	Fixed Income 100% G	Fixed Income 100% F	Transition to 20% SMID/US	Increase I to 40% of Equity	De-risk 5 Years Sooner	De-risk 5 Years Later	10-year Through GP
Account Balance - Median (50th Percentile)	\$555.9	\$562.2	\$555.6	\$558.5	\$558.0	\$558.9	\$554.5	\$557.5	\$567.3
Account Balance - Downside (5th Percentile)	\$294.8	\$293.0	\$294.6	\$297.9	\$294.8	\$295.8	\$295.9	\$293.9	\$294.7
Replacement Ratio - DB+DC+SS - Median (50th Percentile)	70.4%	70.6%	70.4%	70.5%	70.4%	70.5%	70.4%	70.4%	70.8%
Replacement Ratio - DB+DC+SS - Downside (5th Percentile)	63.1%	63.1%	63.1%	63.2%	63.1%	63.2%	63.1%	63.1%	63.0%
Replacement Ratio - TSP Only - Median (50th Percentile)	16.7%	16.8%	16.6%	16.8%	16.7%	16.8%	16.6%	16.7%	17.0%
Replacement Ratio - TSP Only - Downside (5th Percentile)	9.4%	9.3%	9.4%	9.4%	9.4%	9.4%	9.4%	9.4%	9.3%
Likelihood of Negative Real Return ³	Current	Move to Ultimate GP	Fixed Income 100% G	Fixed Income 100% F	Transition to 20% SMID/US	Increase I to 40% of Equity	De-risk 5 Years Sooner	De-risk 5 Years Later	10-year Through GP
Likelihood of < 0% Real Return During 2 Years Before Withdrawal	30.8%	30.8%	31.0%	31.5%	30.7%	30.8%	30.8%	30.8%	30.3%
Likelihood of < -5% Real Return During 2 Years Before Withdrawal	16.4%	16.4%	16.4%	17.9%	16.5%	16.4%	16.4%	16.4%	19.1%
Post-Retirement Account Exhaustion ⁴	Current	Move to Ultimate GP	Fixed Income 100% G	Fixed Income 100% F	Transition to 20% SMID/US	Increase I to 40% of Equity	De-risk 5 Years Sooner	De-risk 5 Years Later	10-year Through GP
Likelihood of Account Exhaustion by Age 80	24.4%	24.1%	24.8%	22.0%	24.3%	23.9%	24.5%	24.4%	21.0%
Likelihood of Account Exhaustion by Age 90	57.2%	56.6%	57.6%	53.8%	57.0%	56.7%	57.4%	57.1%	52.3%
Likelihood of Account Exhaustion by Median Life Expectancy Age	55.4%	54.4%	55.7%	51.4%	55.0%	54.8%	55.5%	55.1%	50.1%
Exhaustion Age - Median (50th Percentile)	87.1	87.4	86.9	88.5	87.2	87.3	87.0	87.2	89.0
Exhaustion Age - Downside (5th Percentile)	74.4	74.3	74.3	74.7	74.4	74.5	74.4	74.4	74.6

¹ Account balance represents the projected account balance at first withdrawal age, discounted back to 2021 with projected inflation. Account balances shown are in thousands.

² Replacement ratio is the ratio of income in the first year of withdrawal to final earnings prior to withdrawal under a conservative hypothetical spending policy. Spending policy is based on converting the DC account balance into an inflation-indexed period-certain annuity based on an interest rate of 3.00%, an inflation rate of 2.10%, and a horizon of 80th percentile life expectancy according to the Pri-2012 mortality and MP-2019 improvement, rounded to the nearest year.

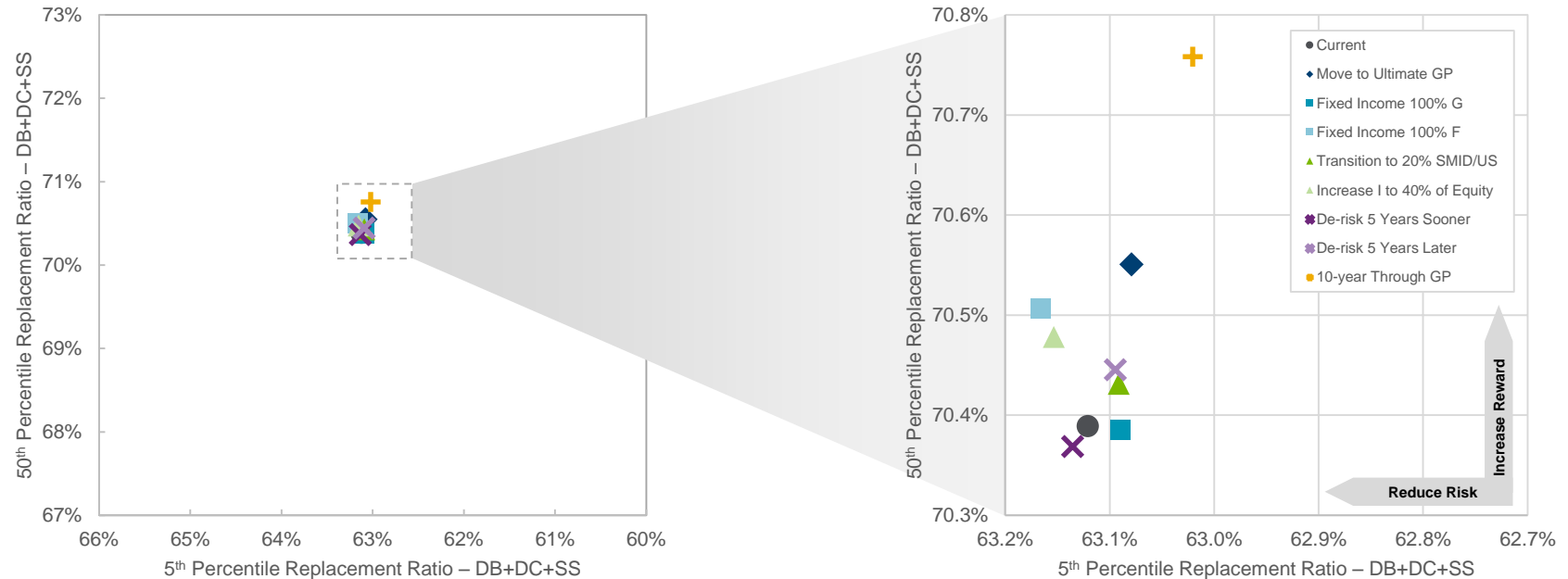
DB+DC+SS replacement ratio measures pay replacement from TSP, Social Security, and defined benefit sources combined. See appendix for more detail.

³ Measures the likelihood of < 0% (or < -5%) compounded real return over the 2-year period prior to withdrawal (between ages 61 and 63).

⁴ Account exhaustion is based on a target retirement spending policy of 80% of final earnings, indexed for projected inflation, minus annual income from guaranteed sources (DB and Social Security), not less than \$0 in any given year.

Summary Results

L 2040 Fund – Expected vs. Downside Replacement Ratio¹



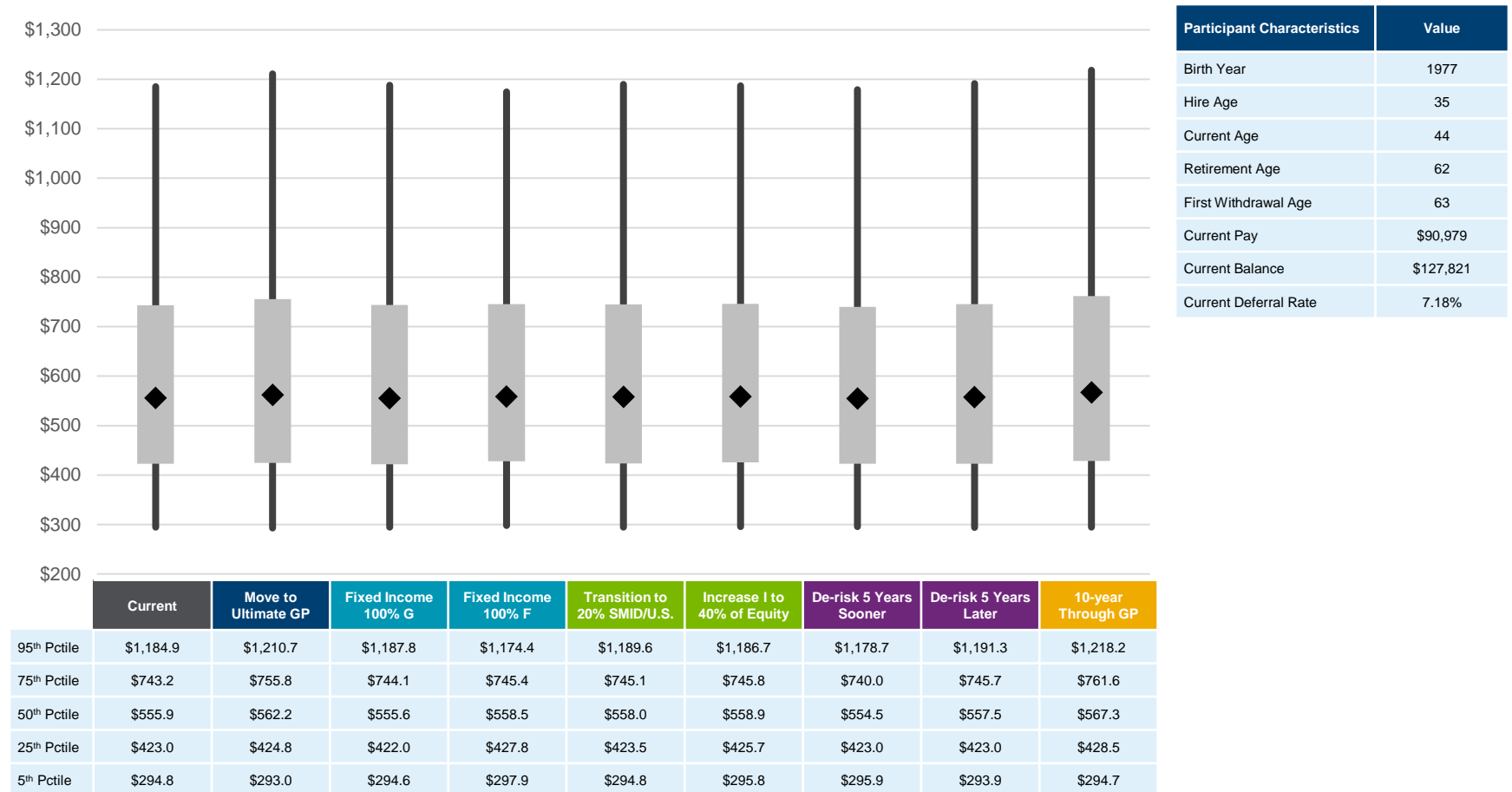
- Results for the various scenarios lead to relatively similar outcomes in absolute terms
- Over long horizons, policies with higher equity allocations have higher expected outcomes, but lower downside outcomes (i.e. higher risk)

¹ Replacement ratio is the ratio of income in the first year of withdrawal to final earnings prior to withdrawal under a conservative hypothetical spending policy. Spending policy is based on converting the DC account balance into an inflation-indexed period-certain annuity based on an interest rate of 3.00%, an inflation rate of 2.10%, and a horizon of 80th percentile life expectancy according to the Pri-2012 mortality and MP-2019 improvement, rounded to the nearest year.

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Summary Results

L 2040 Fund – Distribution of Real Account Balance¹

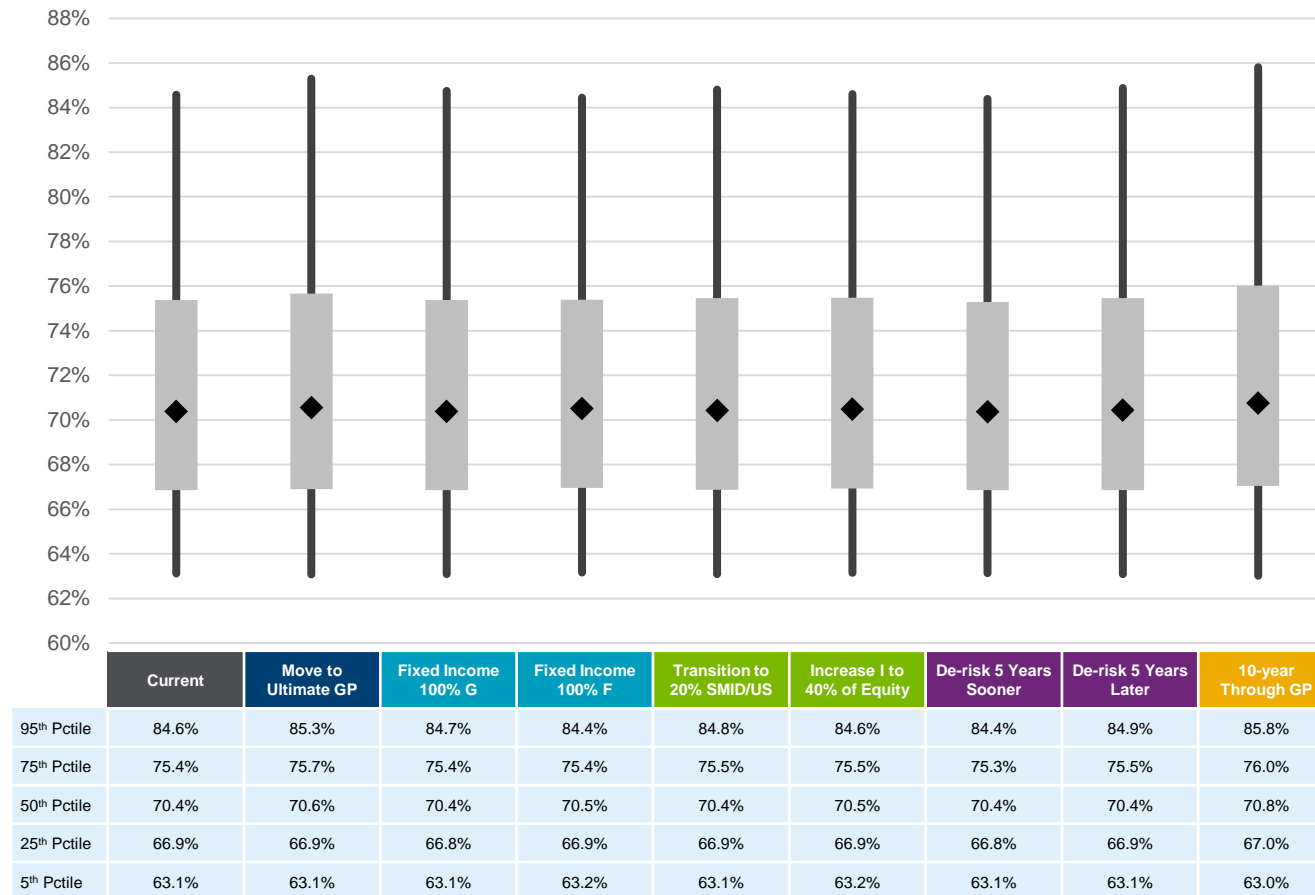


Participant Characteristics	Value
Birth Year	1977
Hire Age	35
Current Age	44
Retirement Age	62
First Withdrawal Age	63
Current Pay	\$90,979
Current Balance	\$127,821
Current Deferral Rate	7.18%

¹ Account balance represents the projected account balance at first withdrawal age, discounted back to 2021 with projected inflation.

Summary Results

L 2040 Fund – Distribution of Replacement Ratio¹



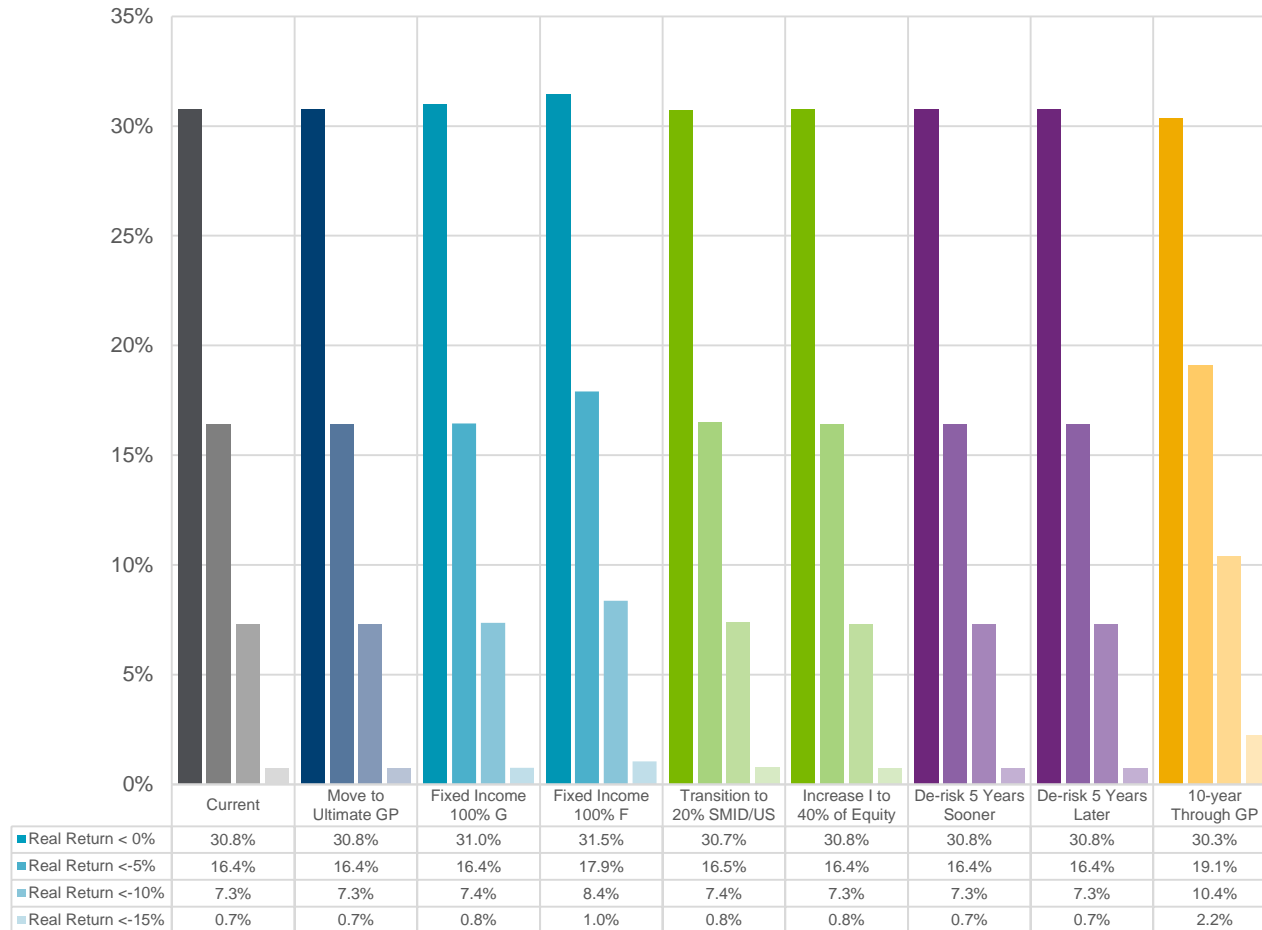
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DB+DC+SS replacement ratio measures pay replacement from TSP, Social Security, and defined benefit sources combined. See appendix for more detail.

Summary Results

L 2040 Fund – Likelihood of Negative Real Return¹



Participant Characteristics	Value
Birth Year	1977
Hire Age	35
Current Age	44
Retirement Age	62
First Withdrawal Age	63
Current Pay	\$90,979
Current Balance	\$127,821
Current Deferral Rate	7.18%

¹ Measures the likelihood of < 0, < -5%, < -10%, or < -15% compounded real return over the 2-year period prior to withdrawal (between ages 61 and 63).



Conclusions and Next Steps

Commentary on Analysis

- **“To” versus “through:”** The current glide path, as well as the transitional glide path, for the L Funds provides participants a reasonable and age-appropriate risk level. Aon believes risk level is a much more important evaluation factor for each participant’s long-term investment outcome than the tactical decision of “to” vs. “through”, which focuses on a single discrete age rather than a full lifecycle.
- **Equity level:** The glide paths Aon tested with higher equity allocations have better expected outcomes for participants, which supports the FRTIB’s long-term transitional glide path implementation strategy.
- **Equity structure:** The allocations with a higher proportion of equity coming from non-U.S. equities perform better for all percentiles shown, but that does not guarantee that it will perform better in practice, as there are some economic scenarios where the additional non-U.S. equity performs worse.
- **Fixed income structure:** Shifting some of the G Fund allocation to the F Fund has incremental impacts in most of the quantitative results (analysis in the appendix), but Aon has less conviction in this change because the results are highly sensitive to capital market assumptions.
- **Timing of change:** Any meaningful glide path changes are subject to a risk of poor timing, which is why Aon continues to support the FRTIB’s long-term transitional glide path approach. This strategy provides incremental changes that allow the TSP to try to mitigate any point-in-time risks in market timing.

Recommendation to Executive Director

- Place all L Funds on paths such that the S Fund's share of the U.S. equity allocation will reach 20% in 2025



Questions?

