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### A DEEPER LOOK AT ASSET ALLOCATION: PLAN STRUCTURE AND DEMOGRAPHY THE KEY TO EFFECTIVE PLAN DESIGN

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#### Key Findings

This analysis of public-sector defined contribution (DC) plan participants' asset allocation using the Public Retirement Research Lab (PRRL) database yields several findings:

##### Large-Cap Funds Dominate

- Nearly one-third of assets in the *Public Retirement Research Lab (PRRL) Database* are in large-cap domestic equity; on a participant-weighted basis, the proportion in this asset class is much lower, reflecting the fact that large-cap domestic equity is more concentrated within the more sizable balances of older workers.

##### Asset Allocations Are Also Concentrated in Stable Value

- On a dollar-weighted basis stable value/fixed account are 18.6 percent of assets.

##### Target-Date Funds Increase Equity Allocations

- Target-date funds are the dominant fund within young participants' accounts.
- On average, all participants with at least some target-date fund allocation have a significantly higher equity concentration than those with no target-date fund allocation—but this is especially true of younger participants.

##### The Youngest Participants in Supplemental Plans May Not Have Appropriate Equity Allocations

- Participants under age 60 in supplemental DC plans have significantly lower total equity proportions than the same cohort in primary or mandated DC plans: there is a 47 percentage point differential for participants aged 20 to 24 between the two plan types.

##### Females Use Target-Date Funds More Than Males — But Otherwise Assume Less Equity Risk

- Females with no target-date fund allocation have a slightly lower equity concentration than males with no target-date fund allocation.
- Females with no target-date fund allocation have a much higher concentration in short-term fixed income and stable value than similarly aged males with no target-date fund allocation.
- Females with at least some target-date fund allocation have a higher concentration in both custom and off-the-shelf target-date funds than similarly aged males with at least some target-date fund allocation.
- Females using target-date funds do so in higher concentration than similarly aged males who use target-date funds.

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## INTRODUCTION

There are meaningful differences between public- and private-sector employees when it comes to factors such as tenure, availability of defined benefit plans and Social Security, and type of defined contribution (DC) plans offered. These differences suggest the need to examine the use of public and private DC systems independently. Since its 2020 inception, the Public Retirement Research Lab (PRRL) has examined the differences between public- and private-sector retirement in such studies as “Trends in Public-Sector Employee Tenure” and “The State of Public Sector DC Plans: A First Look At The PRRL Database.”<sup>1</sup> In this new PRRL Database study, we now examine the distinct factors driving the asset allocation of public-sector DC plan participants, including plan type, primary vs. supplemental plan status, and mandatory vs. voluntary plan status.

This report begins with a description of the PRRL database and then provides overall asset allocation information on both a dollar-weighted and participant-weighted basis. Additionally, dollar-weighted asset allocations are parsed by:

- Age.
- Tenure.
- Salary.
- Plan type.
- Gender.

In each case, detailed information is provided for 25 asset classes. While this enables analysis of individual asset classes by each of these factors, it is often difficult to discern the overall correlation of the factors with equity concentrations. In an attempt to summarize this phenomenon across all of the asset classes, we have devised a "total equity proportion" that classifies each of the 25 asset classes into one of four categories based on equity concentration assumptions and to produce an overall number averaged across the asset classes.

We have also created an online appendix for this study containing additional information on each of the 25 asset classes analyzed, conditional upon the participant having an investment in the particular asset class.

## DATA

This analysis is based on data contained in the PRRL Database, which is the first-ever repository of public-sector DC plan- and participant-level data. The opening PRRL Database contains year-end 2019 data for nearly 200 457(b), 401(a), 403(b), 401(k), and other defined contribution plans; nearly 2.3 million state, county, city, and subdivision government employees; and \$113 billion in assets. While the number of governments participating in the dataset appears small when measured against the thousands of state and local government entities in the United States, it is important to note that many state plans serve as the primary DC vehicle for lower-level governments within their respective states. The state plans in the PRRL Database represent as many as 1,800 participating employers, even though they are counted as a single plan.

## RESULTS

### Overall Asset Allocation

All of the investments for this sample of participants have been classified into one of the 25 asset classes. The allocation of the \$97 billion in DC plan assets for this sample is shown in Figure 1. Large-cap domestic equity is the asset class with the largest amount of assets, constituting nearly one-third (32.2 percent) of the sample on a dollar-weighted basis. This is followed by stable value/fixed account (18.6

<sup>1</sup> Petersen and VanDerhei (2021).

percent) and off-the-shelf target-date funds (10.3 percent). Figure 1 also provides participant-weighted information. In this case, off-the-shelf target-date funds are the largest, with 20.2 percent, followed by stable value/fixed account, with 17.6 percent. Large-cap domestic equity has 17.1 percent and target-date fund (custom) has 15.4 percent (although this asset class has only 4.7 percent on a dollar-weighted basis).

### Asset Allocation by Age

Figure 2 provides dollar-weighted asset allocations by age. Target-date fund (off the shelf) has the largest allocation for the youngest cohort (more than 40 percent for participants in their 20s). It falls to less than 10 percent for participants aged 50 and older. Stable value/fixed account is less than 5 percent for participants in their 20s and exceeds 20 percent for participants aged 60 and older. Large-cap domestic equity is less than 15 percent for participants in their 20s. It reaches 37 percent for those aged 50 to 54. Above age 54, allocations to this asset class decrease gradually, never falling below 30 percent.

While Figure 2 enables analysis of individual investment categories by age, it does not permit easy discernment of overall equity concentrations by age. To gain a view of equity concentrations across all 25 asset classes, we are using a "total equity proportion" that classifies each of the 25 asset classes into one of the following four cohorts:

- 100 percent equity.
- 0 percent equity.
- Mixed (age-invariant equity percentages).
- Target-date funds.

For purposes of this analysis, we assume all asset classes in the mixed cohort have a 60 percent equity concentration. The equity concentration in the target-date-funds asset class is based on Morningstar averages according to participant age.

**Figure 1**  
Overall Distribution of Assets

Fund	Dollar-Weighted Percentage	Participant-Weighted Percentage
Balanced	3.8%	2.0%
Balanced and Sector/Specialty	0.0%	0.0%
Broad International Equity	4.7%	4.5%
Brokerage Window Full	0.3%	0.1%
Cash Equivalents	0.4%	0.5%
Core Fixed Income	6.6%	4.3%
Developed International Equity	0.3%	0.2%
Emerging Markets Equity	0.6%	0.3%
Global Equity	1.7%	1.1%
Global Tactical Asset Allocation	0.0%	0.0%
Global/International Fixed Income	0.1%	0.1%
Inflation-Linked Bonds	0.6%	0.8%
Large-Cap Domestic Equity	32.2%	17.1%
Mid-Cap Domestic Equity	6.8%	3.7%
Other	0.0%	0.0%
Real Estate Investment Trusts (REITs)	0.1%	0.1%
Risk Based	0.1%	0.1%
Sector/Specialty Equity	0.1%	0.0%
Short-Term Fixed Income	2.6%	7.4%
Small-Cap Domestic Equity	4.1%	2.1%
SMID-Cap Domestic Equity	1.2%	1.3%
Specialty/High Yield	0.1%	0.1%
Stable Value/Fixed Account	18.6%	17.6%
Target-Date Fund (Custom)	4.7%	15.4%
Target-Date Fund (Off the Shelf)	10.3%	20.2%

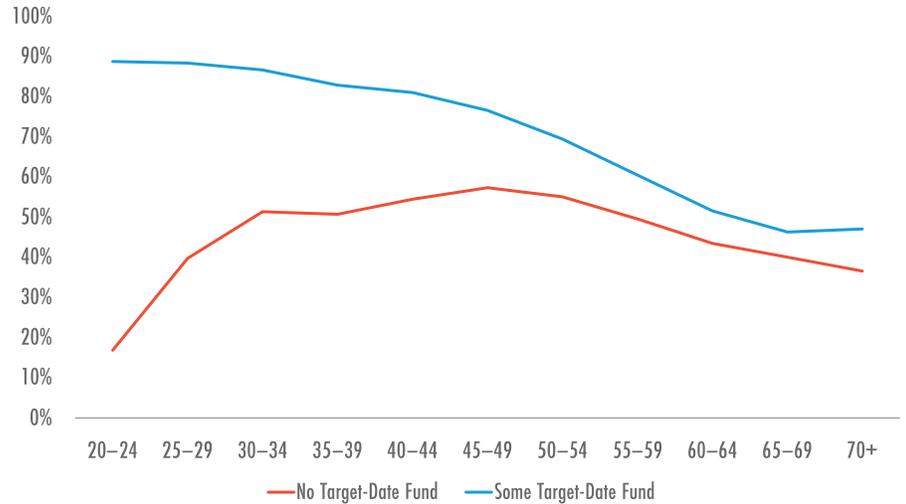
Figure 2  
Dollar-Weighted Allocations by Age

Fund	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Balanced	0.3%	0.6%	1.1%	1.7%	2.3%	2.6%	3.2%	3.9%	4.4%	5.3%	5.2%
Balanced and Sector/Specialty	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Broad International Equity	8.0%	7.3%	7.9%	8.6%	7.9%	7.2%	5.7%	4.5%	3.5%	2.8%	2.4%
Brokerage Window Full	0.0%	0.1%	0.2%	0.2%	0.3%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%
Cash Equivalents	0.4%	0.2%	0.2%	0.3%	0.5%	0.4%	0.4%	0.5%	0.5%	0.4%	0.3%
Core Fixed Income	1.9%	2.2%	3.0%	4.0%	5.3%	6.5%	7.1%	7.5%	7.8%	7.1%	5.4%
Developed International Equity	0.1%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.1%
Emerging Markets Equity	0.1%	0.3%	0.5%	0.8%	1.0%	0.9%	0.7%	0.6%	0.5%	0.4%	0.4%
Global Equity	0.7%	1.4%	1.8%	2.4%	2.6%	2.6%	2.1%	1.8%	1.4%	1.2%	0.8%
Global Tactical Asset Allocation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Global/International Fixed Income	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Inflation-Linked Bonds	1.7%	1.4%	1.4%	1.3%	1.0%	0.9%	0.7%	0.5%	0.5%	0.3%	0.1%
Large-Cap Domestic Equity	11.1%	14.0%	18.2%	24.3%	30.4%	35.7%	36.5%	34.3%	30.9%	29.9%	32.4%
Mid-Cap Domestic Equity	1.3%	2.8%	4.3%	6.2%	7.4%	8.0%	7.9%	7.1%	6.4%	5.8%	6.0%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.0%
Real Estate Investment Trusts (REITs)	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%
Risk Based	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Sector/Specialty Equity	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%
Short-Term Fixed Income	6.7%	1.6%	1.1%	1.0%	1.1%	1.1%	1.5%	2.1%	3.0%	3.9%	5.3%
Small-Cap Domestic Equity	0.8%	1.5%	2.6%	3.8%	4.9%	5.1%	5.0%	4.4%	3.8%	3.4%	3.2%
SMID-Cap Domestic Equity	2.7%	2.4%	2.5%	2.4%	2.2%	2.2%	1.5%	1.0%	0.8%	0.5%	0.2%
Specialty/High Yield	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%
Stable Value/Fixed Account	4.2%	2.7%	5.3%	8.8%	9.0%	9.2%	12.2%	17.4%	22.7%	27.2%	30.7%
Target-Date Fund (Custom)	17.1%	16.4%	13.6%	9.5%	6.8%	5.0%	4.4%	4.0%	4.1%	3.8%	2.7%
Target-Date Fund (Off the Shelf)	42.8%	44.6%	35.8%	23.8%	16.4%	11.4%	9.9%	9.2%	8.7%	7.2%	4.2%

Figure 3 shows the total equity proportion by age for our sample of PRRL Database participants, bifurcated by whether the participants have any target-date-fund allocation. This view reveals the importance of target-date funds in the asset allocation of public-sector plan participants, especially for those under age 50. For those participants with at least some target-date-fund allocation, there is a gradual decrease in the total equity proportion from 88.7 percent for the youngest cohort (20 to 24) to less than 50 percent for those aged 65 and older. However, for those with no target-date-fund allocation, the total equity proportion is only 16.8 percent for the youngest cohort. This proportion rapidly increases to 51.3 percent for those aged 30 to 34. The total equity proportion reaches a maximum of 57.3 percent for those aged 45 to 49 before decreasing to 40 percent or less by the time participants reach age 65. Regardless of age, the average total equity proportion is larger for participants with at least some target-date-fund allocation. The difference ranges from 71.9 percentage points for the youngest cohort to 6.3 percent for participants aged 65 to 69.

Figure 4 provides the participant-weighted asset allocations by age. Target-date fund (off the shelf) has the largest allocations for the youngest cohort (more than 30 percent for participants aged 25–34) and falls to less than 15 percent by the time participants reach their 60s. Target-date fund (custom) has a similar age profile, with more than 25 percent for participants aged 25 to 34, falling to 12 percent or less by the time participants reach their 50s. Stable value/fixed account has less than 10 percent for participants younger than 35 and exceeds 30 percent for participants aged 65 and older. Large-cap domestic equity has less than 10 percent for participants younger than 35 and reaches 22 percent for those aged 50–54.<sup>2</sup>

**Figure 3**  
Total Equity Proportion by Age, Participants With Some Target-Date Funds vs. Those With No Target-Date Funds (dollar weighted)



**Figure 4**  
Participant-Weighted Allocations by Age

Fund	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+
Balanced	0.1%	0.4%	0.7%	1.1%	1.5%	1.7%	2.2%	2.7%	3.2%	3.8%	4.0%
Balanced and Sector/Specialty	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Broad International Equity	3.6%	5.2%	5.7%	5.8%	5.8%	5.7%	4.7%	3.8%	2.9%	2.1%	1.6%
Brokerage Window Full	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%
Cash Equivalents	0.1%	0.1%	0.2%	0.4%	0.5%	0.6%	0.7%	0.8%	0.8%	0.7%	0.6%
Core Fixed Income	0.8%	1.4%	1.9%	2.5%	3.6%	4.9%	5.7%	6.4%	6.7%	6.0%	4.6%
Developed International Equity	0.0%	0.2%	0.2%	0.2%	0.3%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%
Emerging Markets Equity	0.0%	0.1%	0.2%	0.3%	0.4%	0.4%	0.4%	0.3%	0.3%	0.2%	0.2%
Global Equity	0.1%	0.3%	0.6%	1.1%	1.3%	1.5%	1.5%	1.4%	1.2%	1.1%	0.8%
Global Tactical Asset Allocation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Global/International Fixed Income	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Inflation-Linked Bonds	0.8%	1.0%	1.0%	1.0%	0.9%	0.9%	0.8%	0.8%	0.8%	0.5%	0.2%
Large-Cap Domestic Equity	3.8%	7.2%	9.9%	12.7%	16.5%	20.7%	22.3%	21.7%	20.5%	20.7%	22.4%
Mid-Cap Domestic Equity	0.3%	1.1%	2.1%	3.2%	4.2%	4.8%	5.1%	4.8%	4.3%	3.9%	3.8%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Real Estate Investment Trusts (REITs)	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%
Risk Based	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Sector/Specialty Equity	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Short-Term Fixed Income	33.3%	14.8%	7.6%	6.5%	5.4%	4.2%	4.0%	4.2%	5.2%	6.6%	9.4%
Small-Cap Domestic Equity	0.2%	0.7%	1.3%	1.9%	2.4%	2.7%	2.8%	2.6%	2.3%	2.3%	2.1%
SMID-Cap Domestic Equity	1.2%	1.7%	1.7%	1.7%	1.7%	1.8%	1.4%	1.1%	0.8%	0.5%	0.2%
Specialty/High Yield	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%
Stable Value/Fixed Account	9.5%	5.7%	8.0%	13.6%	14.0%	14.5%	17.0%	21.5%	26.2%	30.7%	36.6%
Target-Date Fund (Custom)	19.3%	28.2%	26.1%	19.8%	16.6%	14.0%	12.1%	10.9%	9.9%	8.5%	5.4%
Target-Date Fund (Off the Shelf)	26.7%	31.3%	31.5%	26.7%	23.1%	19.2%	17.3%	15.3%	13.6%	11.3%	6.9%

<sup>2</sup> The remainder of the results in this report will be presented as dollar weighted instead of participant weighted.

### Asset Allocation by Tenure

Figure 5 provides the dollar-weighted asset allocations by tenure. For purposes of this analysis, we have categorized the participants into one of the following six tenure cohorts:

- 0 to 2 years.
- >2 to 5 years.
- >5 to 10 years.
- >10 to 20 years.
- >20 to 30 years.
- >30 years.

Target-date fund (off the shelf) has an allocation of 15.6 percent for those with the least tenure and increases to 21.8 percent for those with >2 to 5 years tenure. The values steadily decrease to only 5.3 percent for those with more than 30 years. Target-date fund (custom) has an allocation of only 2.2 percent for those with the least tenure. The allocation increases to 17.5 percent for those with >5 to 10 years. The values steadily decrease to less than 1 percent for those with more than 30 years tenure.

Figure 6 shows the total equity proportion by tenure bifurcated by target-date-fund allocation. For participants with at least some target-date-fund allocation, there is a gradual decrease in the total equity proportion from 76 to 80 percent for the two cohorts with the least tenure (0 to 5 years) to 54 percent for those with more than 30 years of tenure. However, for those with no target-date-fund allocation, there appears to be diminished tenure influence, with values between 42 and 54 percent for all six tenure cohorts. Regardless of tenure, the average total equity proportion is larger for the group with at least some target-date-fund allocation. The difference ranges from 27 to 35 percentage points for the two cohorts with the least tenure to 11 to 12 percentage points for the two cohorts with the most tenure.

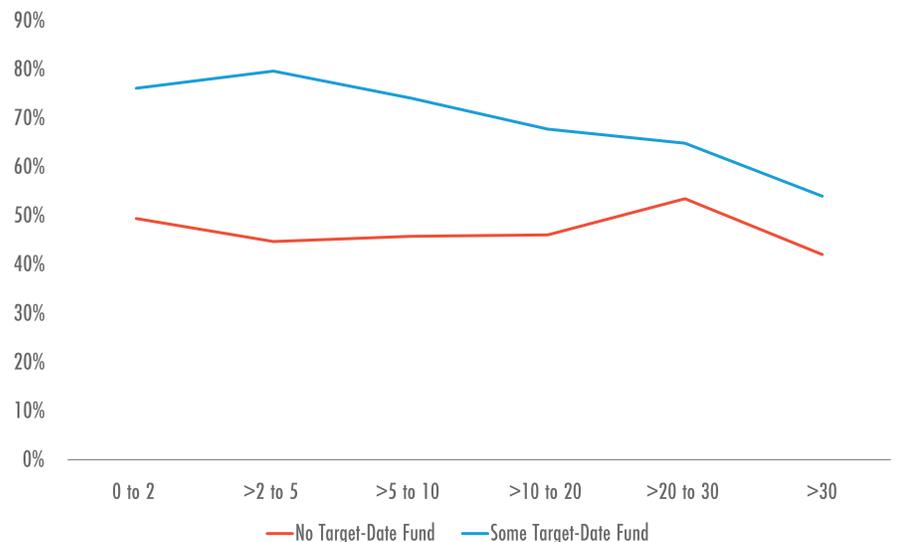
### Asset Allocation by Salary

Figure 7 shows dollar-weighted asset allocations by age and salary. For purposes of this analysis, we have categorized participants according to the following five cohorts:

Figure 5  
Dollar-Weighted Allocations by Tenure

Fund	0 to 2	>2 to 5	>5 to 10	>10 to 20	>20 to 30	>30
Balanced	5.6%	1.2%	1.9%	2.1%	3.4%	5.1%
Balanced and Sector/Specialty	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Broad International Equity	3.6%	5.9%	6.4%	6.9%	4.7%	2.8%
Brokerage Window Full	0.1%	0.2%	0.2%	0.4%	0.4%	0.5%
Cash Equivalents	0.6%	0.3%	0.2%	0.5%	0.4%	0.3%
Core Fixed Income	5.4%	5.4%	6.8%	8.5%	7.5%	5.6%
Developed International Equity	0.6%	0.4%	0.1%	0.1%	0.1%	0.1%
Emerging Markets Equity	0.6%	0.2%	0.3%	0.5%	0.8%	0.7%
Global Equity	0.5%	1.8%	1.4%	2.7%	2.9%	1.4%
Global Tactical Asset Allocation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Global/International Fixed Income	0.0%	0.0%	0.0%	0.1%	0.5%	0.0%
Inflation-Linked Bonds	0.2%	1.2%	0.8%	1.1%	0.6%	0.3%
Large-Cap Domestic Equity	32.0%	20.7%	23.0%	30.6%	38.5%	34.7%
Mid-Cap Domestic Equity	7.0%	7.0%	8.3%	8.3%	6.1%	4.6%
Other	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Real Estate Investment Trusts (REITs)	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%
Risk Based	0.0%	0.0%	0.1%	0.1%	0.3%	0.0%
Sector/Specialty Equity	0.0%	0.1%	0.1%	0.1%	0.1%	0.0%
Short-Term Fixed Income	2.4%	4.7%	7.1%	4.4%	0.8%	0.2%
Small-Cap Domestic Equity	6.0%	2.1%	3.8%	3.9%	3.5%	2.7%
SMID-Cap Domestic Equity	0.3%	2.2%	1.4%	2.2%	1.5%	0.6%
Specialty/High Yield	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Stable Value/Fixed Account	16.7%	10.3%	6.0%	13.2%	19.7%	34.5%
Target-Date Fund (Custom)	2.2%	14.6%	17.5%	7.3%	1.4%	0.5%
Target-Date Fund (Off the Shelf)	15.6%	21.8%	14.8%	7.1%	6.6%	5.3%

Figure 6  
Total Equity Proportion by Tenure



- 10k–25k.
- >25k–50k.
- >50k–75k.
- >75k–100k.
- >100k.

Target-date fund (off the shelf) has an allocation of 18 to 20 percent for those in the lowest two salary cohorts and decreases to nearly 9 percent for those with a salary higher than \$100,000. However, target-date fund (custom) has the opposite trend: Those in the lowest two cohorts have an allocation of less than 4 percent to this asset class, but it increases to 9 percent for those with a salary of more than \$100,000. Stable value/fixed account also decreases as salary increases, rising from more than 23 percent for the smallest two salary cohorts to less than 10 percent for those with a salary of more than \$100,000.

Figure 8 shows the total equity proportion by salary for our sample, bifurcated by whether the participants have any target-date-fund allocation. For those with at least some target-date-fund allocation there is very little salary impact, with all total equity proportions in the 70 to 76 percent range. However, for those with no target-date-fund allocation, there is a significant increase in total equity proportion as salary increases, rising from only 15 percent for the lowest salary cohort to 66 percent for the highest salary cohort.

### Asset Allocation by Plan Type

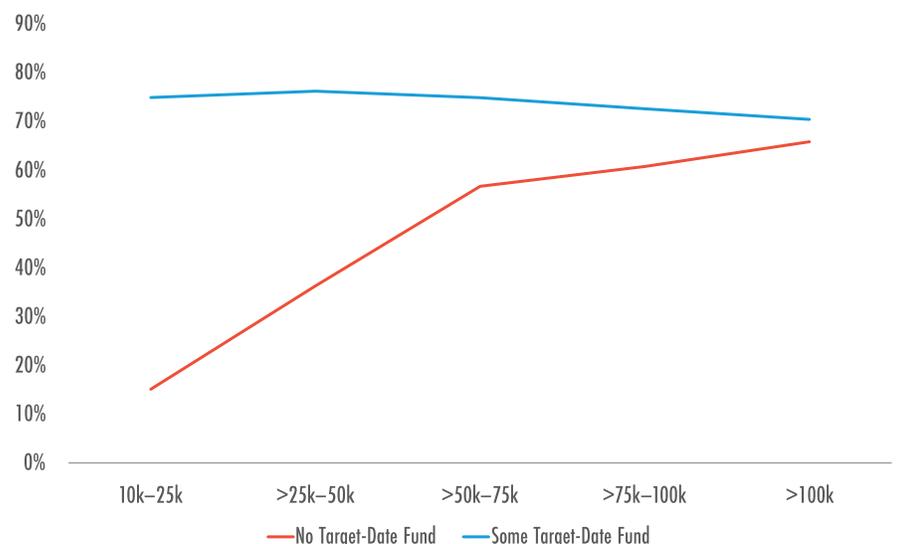
Figure 9 shows the total equity proportion by age for each of the four major plan types in our sample. These are:

- 401(a) plans.
- 401(k) plans.
- 403(b) plans.
- 457(b) plans.

Figure 7  
Asset Allocation by Salary (dollar weighted)

Fund	10k–25k	>25k–50k	>50k–75k	>75k–100k	>100k
Balanced	6.3%	3.9%	2.7%	3.2%	3.4%
Balanced and Sector/Specialty	0.0%	0.0%	0.0%	0.0%	0.0%
Broad International Equity	2.8%	2.7%	3.2%	3.9%	4.6%
Brokerage Window Full	0.2%	0.3%	0.8%	0.7%	0.4%
Cash Equivalents	0.2%	0.5%	0.9%	0.5%	0.2%
Core Fixed Income	4.4%	5.2%	7.2%	7.1%	7.1%
Developed International Equity	0.1%	0.3%	0.3%	0.4%	0.5%
Emerging Markets Equity	1.2%	0.9%	0.9%	1.0%	0.7%
Global Equity	0.9%	2.3%	4.8%	3.1%	1.6%
Global Tactical Asset Allocation	0.0%	0.0%	0.0%	0.0%	0.0%
Global/International Fixed Income	0.0%	0.1%	0.1%	0.1%	0.1%
Inflation-Linked Bonds	0.0%	0.1%	0.1%	0.0%	0.0%
Large-Cap Domestic Equity	30.2%	26.0%	27.5%	31.3%	32.8%
Mid-Cap Domestic Equity	4.0%	5.9%	8.8%	8.8%	9.4%
Other	0.0%	0.0%	0.0%	0.0%	0.0%
Real Estate Investment Trusts (REITs)	0.0%	0.1%	0.1%	0.1%	0.1%
Risk Based	0.0%	0.1%	0.1%	0.1%	0.1%
Sector/Specialty Equity	0.0%	0.0%	0.0%	0.0%	0.0%
Short-Term Fixed Income	1.8%	1.3%	1.7%	3.1%	5.2%
Small-Cap Domestic Equity	3.3%	3.4%	4.1%	5.1%	5.8%
SMID-Cap Domestic Equity	0.3%	0.2%	0.2%	0.3%	0.2%
Specialty/High Yield	0.0%	0.0%	0.0%	0.0%	0.0%
Stable Value/Fixed Account	25.1%	23.4%	15.3%	13.3%	9.8%
Target-Date Fund (Custom)	1.0%	4.0%	4.9%	6.3%	9.2%
Target-Date Fund (Off the Shelf)	18.1%	19.7%	16.3%	11.6%	8.8%

Figure 8  
Total Equity Proportion by Salary



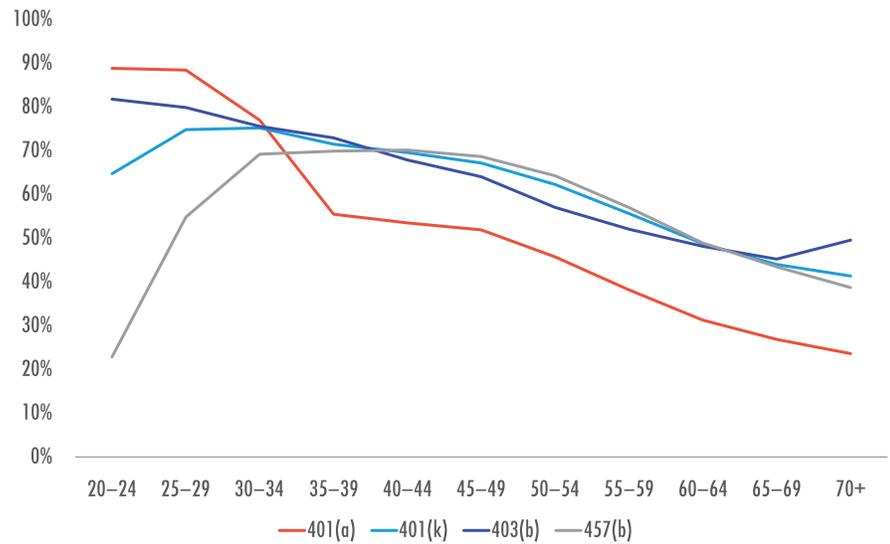
It appears all plan types, with the exception of 457(b) plans, show a general decrease in total equity proportion with age. However, the total equity proportion for 457(b) plans increases from 23 to 55 percent for those participants in their 20s to 70 percent for those aged 34 to 44 before gradually decreasing.

### Asset Allocation by Age and Gender

Figure 10 provides the dollar-weighted asset allocations by age for female participants. Figure 11 provides the same information for male participants. Figure 12A shows the gender differences in asset allocation by age (a positive number denotes females with a larger allocation than males in the same age cohort for that asset class).

Females are much more heavily invested in both types of target-date funds than are their same-aged male

**Figure 9**  
Total Equity Proportion by Plan Type and Age



**Figure 10**  
Asset Allocation by Age for Females

Fund	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+
Balanced	0.2%	0.4%	0.9%	1.6%	2.3%	2.7%	3.4%	4.2%	5.0%	6.2%	6.5%
Balanced and Sector/Specialty	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Broad International Equity	4.0%	4.8%	5.8%	7.3%	7.0%	6.4%	5.4%	4.4%	3.5%	2.7%	2.1%
Brokerage Window Full	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%
Cash Equivalents	0.2%	0.1%	0.2%	0.5%	0.6%	0.5%	0.5%	0.5%	0.5%	0.4%	0.3%
Core Fixed Income	1.2%	1.6%	2.6%	3.9%	5.3%	6.5%	7.2%	8.0%	8.3%	7.4%	5.1%
Developed International Equity	0.1%	0.2%	0.2%	0.2%	0.3%	0.2%	0.3%	0.2%	0.2%	0.2%	0.2%
Emerging Markets Equity	0.1%	0.2%	0.4%	0.6%	0.8%	0.7%	0.6%	0.5%	0.4%	0.4%	0.4%
Global Equity	0.5%	1.1%	1.8%	2.8%	3.2%	3.1%	2.5%	2.1%	1.7%	1.4%	0.9%
Global Tactical Asset Allocation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Global/International Fixed Income	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Inflation-Linked Bonds	0.9%	0.9%	1.0%	1.1%	0.9%	0.8%	0.6%	0.6%	0.5%	0.3%	0.1%
Large-Cap Domestic Equity	7.1%	9.0%	13.6%	20.1%	26.8%	32.0%	33.9%	32.5%	29.6%	29.8%	32.4%
Mid-Cap Domestic Equity	0.9%	2.0%	3.5%	5.7%	7.3%	8.0%	7.9%	7.0%	6.0%	4.9%	4.1%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
Real Estate Investment Trusts (REITs)	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%
Risk Based	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Sector/Specialty Equity	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%
Short-Term Fixed Income	7.1%	1.6%	1.0%	1.1%	1.2%	1.3%	1.6%	2.0%	2.2%	2.2%	1.5%
Small-Cap Domestic Equity	0.5%	1.0%	1.9%	3.1%	4.2%	4.6%	4.7%	4.2%	3.7%	3.4%	2.8%
SMID-Cap Domestic Equity	1.4%	1.6%	1.8%	2.0%	1.7%	1.7%	1.3%	0.9%	0.7%	0.4%	0.2%
Specialty/High Yield	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%
Stable Value/Fixed Account	3.6%	2.2%	5.8%	11.1%	10.9%	10.5%	12.4%	17.2%	22.9%	28.3%	36.5%
Target-Date Fund (Custom)	19.8%	19.2%	16.4%	10.6%	7.8%	5.9%	5.1%	4.2%	3.6%	2.8%	1.2%
Target-Date Fund (Off the Shelf)	52.5%	53.9%	42.8%	27.8%	19.4%	14.5%	11.8%	10.7%	10.3%	8.8%	5.5%

Figure 11  
Asset Allocation by Age for Males

Fund	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Balanced	0.3%	0.8%	1.3%	1.9%	2.5%	2.7%	3.2%	3.9%	4.3%	5.4%	5.7%
Balanced and Sector/Specialty	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Broad International Equity	11.4%	9.8%	9.8%	9.7%	8.6%	7.5%	5.9%	4.5%	3.5%	2.8%	2.3%
Brokerage Window Full	0.0%	0.1%	0.3%	0.3%	0.4%	0.5%	0.4%	0.4%	0.3%	0.4%	0.2%
Cash Equivalents	0.2%	0.2%	0.2%	0.2%	0.3%	0.4%	0.4%	0.5%	0.5%	0.4%	0.3%
Core Fixed Income	2.5%	2.7%	3.3%	4.2%	5.3%	6.4%	6.9%	7.1%	7.3%	6.8%	4.8%
Developed International Equity	0.2%	0.3%	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%	0.2%	0.2%
Emerging Markets Equity	0.1%	0.5%	0.7%	1.0%	1.3%	1.1%	0.9%	0.8%	0.6%	0.5%	0.5%
Global Equity	0.9%	1.7%	1.9%	2.1%	2.3%	2.5%	1.9%	1.6%	1.3%	1.1%	0.8%
Global Tactical Asset Allocation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Global/International Fixed Income	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%
Inflation-Linked Bonds	2.4%	1.9%	1.7%	1.4%	1.0%	0.9%	0.7%	0.5%	0.4%	0.3%	0.1%
Large-Cap Domestic Equity	14.5%	18.5%	22.1%	27.5%	32.7%	37.5%	37.8%	35.4%	31.6%	29.7%	32.9%
Mid-Cap Domestic Equity	1.6%	3.6%	4.9%	6.5%	7.7%	8.3%	7.9%	7.0%	6.1%	5.4%	5.0%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%
Real Estate Investment Trusts (REITs)	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Risk Based	0.0%	0.0%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	0.2%	0.1%	0.1%
Sector/Specialty Equity	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%
Short-Term Fixed Income	4.8%	1.3%	0.8%	0.8%	0.9%	0.9%	1.4%	1.8%	2.3%	2.3%	2.1%
Small-Cap Domestic Equity	1.1%	2.0%	3.1%	4.4%	5.6%	5.6%	5.4%	4.8%	4.0%	3.4%	3.2%
SMID-Cap Domestic Equity	3.9%	3.2%	3.1%	2.8%	2.3%	2.2%	1.5%	1.0%	0.8%	0.6%	0.3%
Specialty/High Yield	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%
Stable Value/Fixed Account	4.5%	3.1%	4.7%	6.5%	7.2%	8.2%	11.9%	17.9%	24.3%	30.1%	34.8%
Target-Date Fund (Custom)	13.8%	12.2%	9.8%	7.9%	5.6%	4.2%	3.6%	3.2%	3.4%	2.8%	1.6%
Target-Date Fund (Off the Shelf)	37.4%	37.8%	31.6%	22.0%	15.2%	10.2%	9.2%	8.7%	8.5%	7.4%	4.8%

counterparts. For target-date fund (off the shelf), females in their 20s have allocations of at least 15 percentage points larger than those of their male counterparts. This differential decreases with age and is less than 2 percentage points for participants aged 55 and older.

A similar but more muted trend appears for allocations to target-date fund (custom). In this case, females in their 20s have allocations 5.9 to 7.0 percentage points larger than those of their male counterparts. This differential decreases with age and is less than 2 percentage points for participants aged 45 and older.

Males, on the other hand, are significantly more heavily invested in large-cap domestic equity than are their female counterparts. For this asset class, males in their 20s have allocations 7.4 to 9.5 percentage points larger than those of their female counterparts. This differential decreases with age and is less than 3 percentage points for participants aged 55 and older.

Males are also more heavily invested in broad international equity. For this asset class, males in their 20s have allocations that are 5.0 to 7.4 percentage points larger than those of their female counterparts. This differential decreases with age and is less than 2 percentage points for participants aged 40 and older.

Some of the gender differences in asset allocation in Figure 12A can be explained by bifurcating the sample into those with some TDF vs those with no TDF. Figure 12B shows the gender differences in asset allocation by age for those with no TDF in their portfolio. We see that females on average tend to invest more in short-term fixed income and stable value than their male counterparts whereas males with no TDFs

tend to invest much more in large cap domestic equity and broad international equity.

Figure 12C shows the gender differences in asset allocation by age for those with some TDF in their portfolio. Males again tend to invest more in equities than their female counterparts (especially large cap and mid cap domestic equity) while females have significantly larger allocations to target date funds (both custom and off the shelf) than do their male counterparts.

Figure 12A  
Gender Differences in Asset Allocation by Age

Fund	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Balanced	-0.1%	-0.4%	-0.4%	-0.3%	-0.2%	0.0%	0.2%	0.4%	0.7%	0.8%	0.8%
Balanced and Sector/Specialty	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Broad International Equity	-7.4%	-5.0%	-4.0%	-2.4%	-1.7%	-1.1%	-0.5%	-0.1%	0.0%	0.0%	-0.2%
Brokerage Window Full	0.1%	0.0%	-0.2%	-0.2%	-0.2%	-0.3%	-0.2%	-0.1%	-0.1%	-0.3%	-0.1%
Cash Equivalents	-0.1%	-0.1%	0.1%	0.2%	0.3%	0.1%	0.1%	0.0%	0.1%	0.0%	-0.1%
Core Fixed Income	-1.3%	-1.1%	-0.7%	-0.2%	0.0%	0.1%	0.3%	0.8%	1.0%	0.6%	0.3%
Developed International Equity	-0.1%	-0.1%	-0.1%	-0.2%	-0.1%	-0.2%	-0.1%	-0.1%	0.0%	-0.1%	0.0%
Emerging Markets Equity	-0.1%	-0.3%	-0.3%	-0.4%	-0.5%	-0.4%	-0.3%	-0.3%	-0.1%	-0.1%	-0.1%
Global Equity	-0.4%	-0.6%	-0.1%	0.7%	0.9%	0.7%	0.6%	0.5%	0.4%	0.3%	0.1%
Global Tactical Asset Allocation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Global/International Fixed Income	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%
Inflation-Linked Bonds	-1.6%	-1.0%	-0.7%	-0.3%	-0.2%	-0.1%	0.0%	0.1%	0.1%	0.1%	0.0%
Large-Cap Domestic Equity	-7.4%	-9.5%	-8.4%	-7.3%	-5.9%	-5.5%	-3.9%	-2.9%	-2.0%	0.1%	-0.5%
Mid-Cap Domestic Equity	-0.8%	-1.6%	-1.5%	-0.8%	-0.4%	-0.3%	0.0%	0.1%	-0.1%	-0.5%	-0.9%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%
Real Estate Investment Trusts (REITs)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Risk Based	0.0%	0.0%	-0.1%	0.0%	-0.1%	-0.1%	0.0%	0.0%	-0.1%	0.0%	0.0%
Sector/Specialty Equity	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Short-Term Fixed Income	2.3%	0.3%	0.2%	0.3%	0.2%	0.4%	0.3%	0.3%	-0.1%	-0.1%	-0.6%
Small-Cap Domestic Equity	-0.6%	-1.0%	-1.2%	-1.3%	-1.5%	-1.0%	-0.7%	-0.6%	-0.3%	0.0%	-0.4%
SMID-Cap Domestic Equity	-2.5%	-1.6%	-1.3%	-0.8%	-0.6%	-0.5%	-0.2%	-0.1%	0.0%	-0.1%	-0.1%
Specialty/High Yield	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Stable Value/Fixed Account	-1.0%	-1.0%	1.1%	4.6%	3.6%	2.3%	0.4%	-0.7%	-1.4%	-1.8%	1.7%
Target-Date Fund (Custom)	5.9%	7.0%	6.6%	2.7%	2.2%	1.8%	1.5%	1.0%	0.3%	0.0%	-0.4%
Target-Date Fund (Off the Shelf)	15.1%	16.1%	11.2%	5.8%	4.2%	4.2%	2.6%	2.0%	1.9%	1.4%	0.7%

NB: A positive number denotes that females have a higher allocation than males in the same age cohort for that investment category.

Figure 12B  
Gender Differences in Asset Allocation by Age for Those With No Target-Date Fund

Fund	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Balanced	0.0%	-0.1%	0.0%	0.0%	0.0%	0.3%	0.4%	0.6%	1.0%	1.2%	1.0%
Balanced and Sector/Specialty	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Broad International Equity	-9.4%	-2.4%	-2.9%	-2.4%	-1.5%	-0.7%	-0.2%	0.1%	0.2%	0.1%	-0.2%
Brokerage Window Full	0.3%	0.2%	-0.2%	-0.2%	-0.2%	-0.4%	-0.3%	-0.2%	-0.2%	-0.3%	-0.1%
Cash Equivalents	0.3%	0.0%	0.2%	0.3%	0.3%	0.2%	0.2%	0.0%	0.1%	0.0%	-0.1%
Core Fixed Income	-1.0%	0.6%	0.5%	0.2%	0.6%	0.7%	0.7%	1.5%	1.4%	0.8%	0.2%
Developed International Equity	-0.2%	0.1%	-0.1%	-0.2%	-0.1%	-0.2%	-0.2%	-0.1%	-0.1%	-0.1%	0.0%
Emerging Markets Equity	-0.1%	0.0%	-0.2%	-0.4%	-0.5%	-0.4%	-0.3%	-0.3%	-0.2%	-0.1%	-0.1%
Global Equity	0.0%	0.7%	1.2%	1.6%	1.5%	1.1%	0.9%	0.7%	0.5%	0.3%	0.0%
Global Tactical Asset Allocation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Global/International Fixed Income	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%
Inflation-Linked Bonds	-2.0%	-0.6%	-0.6%	-0.3%	-0.2%	0.0%	0.0%	0.1%	0.1%	0.1%	0.0%
Large-Cap Domestic Equity	-4.5%	-3.5%	-3.5%	-6.4%	-4.7%	-3.9%	-2.9%	-2.3%	-1.6%	0.4%	-0.8%
Mid-Cap Domestic Equity	-0.2%	0.3%	-0.1%	-0.2%	0.4%	0.5%	0.6%	0.5%	0.3%	-0.2%	-0.8%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%
Real Estate Investment Trusts (REITs)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Risk Based	0.0%	0.0%	-0.1%	0.0%	-0.1%	-0.1%	0.0%	0.0%	-0.1%	0.0%	0.0%
Sector/Specialty Equity	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Short-Term Fixed Income	16.3%	3.5%	0.9%	0.5%	0.4%	0.5%	0.3%	0.3%	0.0%	-0.2%	-0.5%
Small-Cap Domestic Equity	-0.4%	-0.2%	-0.7%	-1.1%	-1.4%	-0.7%	-0.5%	-0.5%	-0.2%	0.0%	-0.4%
SMID-Cap Domestic Equity	-3.1%	-0.7%	-1.0%	-0.9%	-0.7%	-0.5%	-0.2%	0.0%	0.0%	-0.2%	-0.1%
Specialty/High Yield	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Stable Value/Fixed Account	4.0%	2.1%	6.7%	9.6%	6.3%	3.8%	1.5%	-0.2%	-1.3%	-1.6%	1.9%
Target-Date Fund (Custom)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Target-Date Fund (Off the Shelf)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

NB: A positive number denotes that females have a higher allocation than males in the same age cohort for that investment category.

Figure 12C  
Gender Differences in Asset Allocation by Age for Those With Some Target-Date Fund

Fund	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Balanced	0.0%	-0.2%	-0.3%	-0.4%	-0.4%	-0.6%	-0.1%	-0.2%	0.1%	-0.1%	-0.1%
Balanced and Sector/Specialty	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Broad International Equity	-0.1%	-0.3%	-0.4%	-0.6%	-0.6%	-0.5%	-0.5%	-0.3%	-0.3%	-0.4%	-0.4%
Brokerage Window Full	0.0%	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%	0.1%	-0.1%	0.0%
Cash Equivalents	-0.1%	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%	0.0%	-0.1%	-0.1%	-0.1%
Core Fixed Income	0.0%	-0.2%	-0.1%	-0.1%	-0.2%	-0.2%	0.1%	-0.2%	0.1%	0.2%	0.3%
Developed International Equity	0.0%	0.0%	0.0%	-0.1%	-0.1%	0.0%	-0.1%	-0.1%	0.0%	-0.1%	0.0%
Emerging Markets Equity	0.0%	-0.2%	-0.3%	-0.3%	-0.4%	-0.4%	-0.2%	-0.2%	-0.1%	-0.1%	0.0%
Global Equity	-0.1%	-0.1%	-0.1%	0.0%	0.2%	0.0%	0.1%	0.1%	0.1%	0.1%	0.2%
Global Tactical Asset Allocation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Global/International Fixed Income	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Inflation-Linked Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Large-Cap Domestic Equity	-1.0%	-3.1%	-4.3%	-4.8%	-4.6%	-4.8%	-2.9%	-2.7%	-2.2%	0.2%	0.8%
Mid-Cap Domestic Equity	-0.3%	-0.9%	-0.9%	-0.7%	-1.0%	-1.3%	-0.9%	-0.8%	-1.0%	-1.1%	-1.6%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%	-0.1%	0.0%
Real Estate Investment Trusts (REITs)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Risk Based	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sector/Specialty Equity	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Short-Term Fixed Income	0.0%	-0.1%	0.0%	0.1%	0.1%	0.1%	0.2%	0.3%	-0.4%	0.3%	-1.0%
Small-Cap Domestic Equity	-0.4%	-0.6%	-0.8%	-1.1%	-1.2%	-1.3%	-0.8%	-0.7%	-0.4%	-0.3%	-0.7%
SMID-Cap Domestic Equity	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%
Specialty/High Yield	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Stable Value/Fixed Account	-0.5%	-0.8%	-0.6%	0.0%	0.1%	0.1%	-0.6%	-0.6%	-0.6%	-1.0%	0.6%
Target-Date Fund (Custom)	1.0%	3.4%	5.6%	3.1%	3.4%	2.7%	2.6%	2.3%	0.1%	-0.8%	-2.4%
Target-Date Fund (Off the Shelf)	1.6%	3.3%	2.6%	5.0%	4.8%	6.4%	3.1%	3.3%	4.7%	3.4%	4.5%

NB: A positive number denotes that females have a higher allocation than males in the same age cohort for that investment category.

Figure 13 shows the total equity proportion by gender bifurcated by whether participants have any target-date-fund allocation. For those with at least some target-date-fund allocation there is very little gender impact, with all differences in total equity proportions being less than 2 percentage points. However, for those with no target-date-fund allocation, there is a significantly larger total equity proportion for males, especially at the younger ages. For participants with no target-date-fund allocation, males in their 20s have a 10 to 16 percentage point larger total equity proportion than females. This differential decreases with age and is 3 percentage points or less for those participants aged 60 and older.

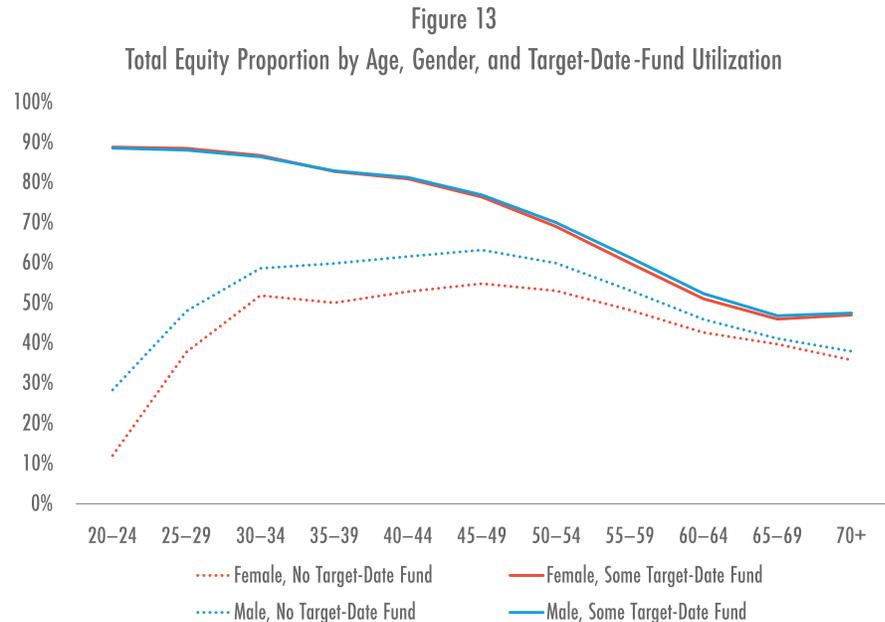
### Asset Allocation by Age and Primary/Supplemental Status

In the public sector, defined benefit (DB) plans have traditionally served the role of primary retirement vehicle. However, as noted in “The State of Public DC Plans” report, every state has undergone meaningful pension system reform since 2009. For some, reform has led to a more central role for DC plans and has even led some governments to make a DC plan the primary vehicle. A few states, such as Michigan and Alaska, have eliminated access to DB plans for new employees who must now rely solely on a DC plan. A more common approach is to add a 401(a) plan as a hybrid option alongside a DB plan.

For the purposes of this analysis, DC plans serving as the primary retirement vehicle, whether as the sole option or as a hybrid, are identified as primary. When the DB plan is the sole primary retirement vehicle, the DC plan (often a voluntary 457(b) or 401(k) plan) is identified as supplemental.

Figure 14 provides the dollar-weighted asset allocations by age for participants in supplemental plans. Figure 15 provides this information for participants in primary plans. Figure 16 shows the primary/supplemental plan differences in allocations by age (a positive number denotes participants in supplemental plans with a higher allocation than participants in primary plans in the same age cohort for that asset class).

For target-date fund (off the shelf), participants in primary plans in their 20s have allocations 64 to 79 percentage points larger than those of their counterparts in supplemental plans. This differential decreases with age and is less than 10 percentage points for participants aged 55 and older.



**Figure 14**  
Asset Allocation by Age for Supplemental Plans

Fund	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Balanced	0.4%	0.9%	1.3%	1.7%	2.3%	2.5%	3.0%	3.7%	4.2%	5.2%	5.5%
Balanced and Sector/Specialty	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Broad International Equity	14.2%	12.0%	11.1%	10.2%	8.9%	7.9%	6.2%	4.8%	3.7%	2.9%	2.4%
Brokerage Window Full	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%
Cash Equivalents	0.7%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Core Fixed Income	3.0%	2.9%	3.4%	4.0%	4.9%	6.0%	6.5%	6.6%	6.9%	6.3%	5.0%
Developed International Equity	0.2%	0.3%	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%	0.2%	0.2%
Emerging Markets Equity	0.1%	0.4%	0.5%	0.8%	0.9%	0.8%	0.7%	0.6%	0.5%	0.4%	0.4%
Global Equity	0.2%	0.3%	0.6%	1.2%	1.5%	1.6%	1.3%	1.2%	1.0%	0.8%	0.6%
Global Tactical Asset Allocation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Global/International Fixed Income	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Inflation-Linked Bonds	3.2%	2.5%	2.1%	1.7%	1.3%	1.1%	0.8%	0.6%	0.5%	0.3%	0.1%
Large-Cap Domestic Equity	17.2%	18.9%	21.4%	25.9%	32.0%	37.4%	37.9%	35.6%	31.8%	31.0%	33.6%
Mid-Cap Domestic Equity	0.9%	2.4%	3.7%	5.2%	6.2%	7.0%	7.2%	6.7%	6.0%	5.5%	5.9%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Real Estate Investment Trusts (REITs)	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Risk Based	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sector/Specialty Equity	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%
Short-Term Fixed Income	12.6%	2.9%	1.6%	1.4%	1.4%	1.4%	1.8%	2.5%	3.6%	4.5%	5.8%
Small-Cap Domestic Equity	0.7%	1.7%	2.4%	3.4%	4.1%	4.3%	4.3%	3.8%	3.3%	3.2%	3.1%
SMID-Cap Domestic Equity	5.1%	4.3%	3.7%	3.3%	2.9%	2.8%	1.9%	1.2%	0.9%	0.5%	0.2%
Specialty/High Yield	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Stable Value/Fixed Account	3.3%	3.6%	7.3%	11.2%	11.1%	10.8%	13.8%	19.1%	24.4%	27.8%	30.2%
Target-Date Fund (Custom)	29.1%	28.0%	20.5%	12.8%	8.9%	6.4%	5.4%	4.9%	4.9%	4.3%	3.0%
Target-Date Fund (Off the Shelf)	9.2%	18.7%	19.7%	16.6%	12.8%	9.2%	8.3%	8.0%	7.7%	6.6%	4.0%

**Figure 15**  
Asset Allocation by Age for Primary Plans

Fund	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
Balanced	0.1%	0.1%	0.4%	0.8%	1.2%	1.3%	1.7%	2.0%	2.1%	2.2%	2.1%
Balanced and Sector/Specialty	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Broad International Equity	0.2%	0.5%	1.1%	3.4%	5.0%	5.1%	4.4%	3.5%	2.9%	2.5%	2.7%
Brokerage Window Full	0.1%	0.2%	0.5%	0.9%	1.3%	1.8%	2.0%	2.1%	2.3%	2.4%	3.7%
Cash Equivalents	0.1%	0.2%	0.5%	1.1%	1.8%	1.7%	1.7%	2.2%	2.3%	2.6%	2.3%
Core Fixed Income	0.6%	1.2%	2.2%	4.6%	7.1%	9.3%	10.9%	13.5%	15.3%	13.6%	10.6%
Developed International Equity	0.1%	0.2%	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Emerging Markets Equity	0.1%	0.3%	0.6%	1.4%	2.1%	2.0%	1.7%	1.2%	1.0%	1.0%	0.8%
Global Equity	1.6%	3.2%	5.0%	8.0%	8.6%	9.5%	9.0%	8.2%	6.8%	4.9%	3.7%
Global Tactical Asset Allocation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Global/International Fixed Income	0.0%	0.0%	0.0%	0.1%	0.3%	0.6%	1.1%	1.2%	1.5%	1.2%	1.6%
Inflation-Linked Bonds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Large-Cap Domestic Equity	3.6%	6.2%	9.8%	16.5%	21.9%	24.9%	24.3%	21.8%	18.3%	17.4%	18.0%
Mid-Cap Domestic Equity	1.4%	3.0%	5.0%	8.6%	11.5%	12.0%	11.3%	9.6%	8.4%	7.5%	7.6%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Real Estate Investment Trusts (REITs)	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%
Risk Based	0.0%	0.0%	0.2%	0.6%	0.6%	0.6%	0.9%	0.7%	1.1%	0.9%	0.8%
Sector/Specialty Equity	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%
Short-Term Fixed Income	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Small-Cap Domestic Equity	0.6%	0.9%	1.9%	3.8%	5.7%	5.7%	5.1%	4.2%	3.7%	3.6%	4.2%
SMID-Cap Domestic Equity	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Specialty/High Yield	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Stable Value/Fixed Account	0.2%	0.3%	0.8%	1.7%	2.2%	4.1%	7.0%	13.5%	20.2%	29.5%	35.9%
Target-Date Fund (Custom)	3.6%	1.3%	0.7%	0.3%	0.2%	0.1%	0.1%	0.2%	0.2%	0.3%	0.2%
Target-Date Fund (Off the Shelf)	87.7%	82.4%	70.8%	48.0%	30.4%	21.2%	18.7%	15.9%	13.7%	10.4%	5.6%

The opposite trend is evident for target-date fund (custom). In this case, participants in supplemental plans in their 20s have allocations at least 25 percentage points larger than those of their counterparts in primary plans. This differential decreases with age and is less than 5 percentage points for participants aged 55 and older.

**Figure 16**  
Plan Status Differences in Asset Allocation by Age

Fund	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+	Sum
Balanced	0.3%	0.8%	0.9%	0.9%	1.1%	1.2%	1.3%	1.6%	2.1%	3.0%	3.4%	16.6%
Balanced and Sector/Specialty	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Broad International Equity	14.0%	11.6%	9.9%	6.8%	3.9%	2.8%	1.8%	1.3%	0.8%	0.4%	-0.3%	53.0%
Brokerage Window Full	-0.1%	-0.2%	-0.4%	-0.8%	-1.2%	-1.6%	-1.9%	-2.0%	-2.2%	-2.3%	-3.7%	-16.5%
Cash Equivalents	0.5%	-0.1%	-0.4%	-1.0%	-1.7%	-1.6%	-1.6%	-2.1%	-2.3%	-2.5%	-2.3%	-15.1%
Core Fixed Income	2.5%	1.7%	1.1%	-0.6%	-2.1%	-3.3%	-4.3%	-6.8%	-8.4%	-7.2%	-5.6%	-33.1%
Developed International Equity	0.1%	0.1%	0.2%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	2.5%
Emerging Markets Equity	0.0%	0.0%	-0.1%	-0.6%	-1.2%	-1.2%	-1.0%	-0.6%	-0.6%	-0.6%	-0.4%	-6.3%
Global Equity	-1.4%	-2.9%	-4.4%	-6.8%	-7.1%	-7.9%	-7.7%	-7.0%	-5.8%	-4.1%	-3.1%	-58.3%
Global Tactical Asset Allocation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Global/International Fixed Income	0.0%	0.0%	0.0%	-0.1%	-0.3%	-0.6%	-1.1%	-1.2%	-1.5%	-1.2%	-1.5%	-7.5%
Inflation-Linked Bonds	3.2%	2.5%	2.1%	1.7%	1.3%	1.1%	0.8%	0.6%	0.5%	0.3%	0.1%	13.9%
Large-Cap Domestic Equity	13.7%	12.7%	11.6%	9.3%	10.1%	12.5%	13.7%	13.7%	13.5%	13.6%	15.6%	140.0%
Mid-Cap Domestic Equity	-0.5%	-0.6%	-1.4%	-3.4%	-5.3%	-5.0%	-4.1%	-2.9%	-2.3%	-2.0%	-1.8%	-29.1%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Real Estate Investment Trusts (REITs)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.3%
Risk Based	0.0%	0.0%	-0.2%	-0.6%	-0.6%	-0.6%	-0.9%	-0.6%	-1.1%	-0.9%	-0.8%	-6.3%
Sector/Specialty Equity	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
Short-Term Fixed Income	12.6%	2.9%	1.6%	1.4%	1.4%	1.4%	1.8%	2.5%	3.6%	4.5%	5.8%	39.5%
Small-Cap Domestic Equity	0.1%	0.8%	0.5%	-0.5%	-1.5%	-1.4%	-0.8%	-0.4%	-0.4%	-0.4%	-1.1%	-5.2%
SMID-Cap Domestic Equity	5.1%	4.3%	3.7%	3.3%	2.9%	2.8%	1.9%	1.2%	0.9%	0.5%	0.2%	26.7%
Specialty/High Yield	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Stable Value/Fixed Account	3.0%	3.3%	6.6%	9.5%	8.9%	6.8%	6.9%	5.7%	4.2%	-1.7%	-5.7%	47.4%
Target-Date Fund (Custom)	25.5%	26.7%	19.8%	12.5%	8.8%	6.3%	5.3%	4.7%	4.6%	4.1%	2.8%	121.0%
Target-Date Fund (Off the Shelf)	-78.5%	-63.7%	-51.1%	-31.4%	-17.6%	-12.0%	-10.3%	-7.9%	-5.9%	-3.8%	-1.7%	-283.8%

NB: A positive number denotes that supplemental plans have a higher allocation than primary plans in the same age cohort for that investment category.

Figure 17 shows the total equity proportion by primary/supplemental plan status. For participants under age 60, the total equity proportion is significantly larger for primary plans than it is for supplemental plans. There is a 47 percentage point differential for participants aged 20 to 24. This differential drops to 22 percentage points for participants aged 25 to 29. It decreases with age and is only 1 percentage point for those participants aged 60 to 64. It turns negative for participants aged 65 and older.

### Asset Allocation by Age and Mandatory/Voluntary Status

Plans are classified into one of the following cohorts:

- Mandatory with no voluntary contributions.
- Mandatory with voluntary contributions allowed.
- Voluntary.

Figure 18 shows the total equity proportion by mandatory/voluntary plan status. The total equity proportion for the mandatory-with-no-voluntary and voluntary cohorts are virtually identical regardless of age. However, the mandatory-with-voluntary-contributions-allowed cohort has a significantly lower total equity proportion than the other plan-status cohorts for participants aged 35 and older. For all older age cohorts, the total equity proportion for the mandatory-with-voluntary-contributions-allowed cohort is at least 18 percentage points lower than that of the other two cohorts.

### CONCLUSION

This analysis of public-sector DC plan participants' asset allocation using the PRRL database yields several findings suggesting the need for additional research.

The majority of public-sector DC participant asset allocations are concentrated in just a few investment types, such as large-cap equity and stable value. This is true despite the high number of investment options offered by these plans. While we do not yet have the data to support an explanation for this finding, several private-sector retirement studies have illuminated trends such as too many investment options causing confusion and participant inertia toward default investments. Given the variety of retirement system structures in the public sector, any one cause is unlikely to have a universal application. We will dedicate future studies to exploring the different possibilities.

The fact that participants under age 60 in supplemental DC plans have significantly lower total equity proportions than the same cohort in primary or mandated DC plans is also notable. Two competing ideas offer perspective on interpreting these data. One states that those with a primary DB plan might be in a position to assume *more* risk in their DC plan. The DB plan could be viewed essentially as a fixed-income

Figure 17

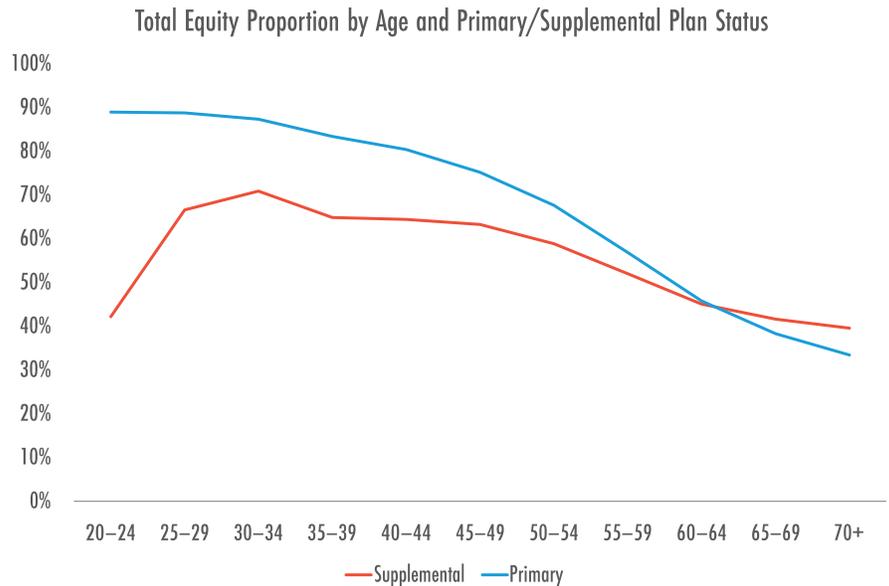
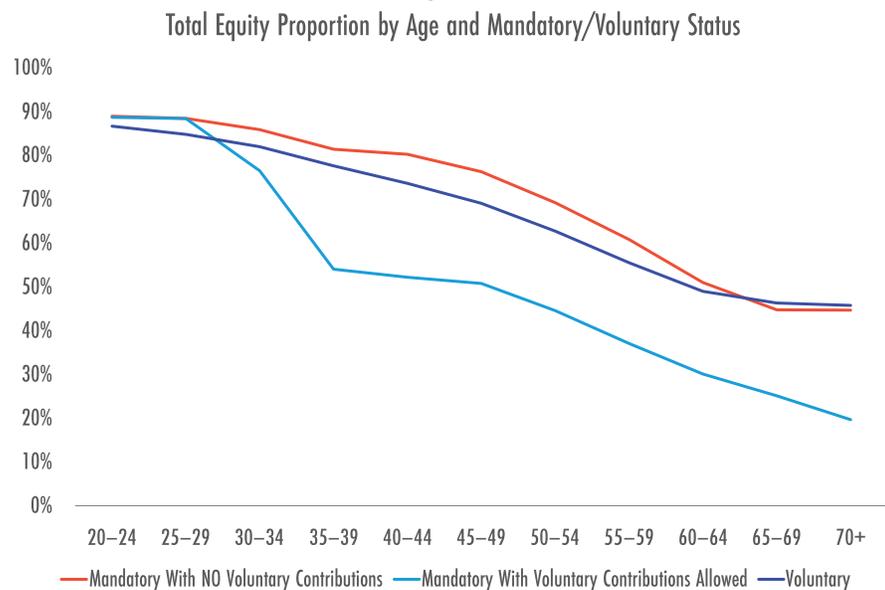


Figure 18



holding, allowing greater ownership of equities in the DC plan, especially for younger participants. Another view states that those with supplemental DC plans may feel little need to take on additional risk for potentially enhanced returns given their possession of a DB plan. Additional research is needed to determine whether either of these is correct or if other explanations apply.

Another striking finding from this study is the difference in asset allocations between female and male participants. This analysis reveals that female participants are significantly less heavily invested in equities — specifically large-cap domestic and broad international equity — than their male counterparts, preferring stable-value or fixed-income products. At the same time, female participants are more heavily invested in both custom and off-the-shelf target-date funds than their same-aged male counterparts, when target-date funds are available. Again, much work remains to understand why.

As we continue to collect and analyze public-sector DC plan data, we anticipate future analysis focused on identifying the underlying reasons for these and all other provocative findings we uncover.

Better understanding of public-sector DC plan utilization through analysis of PRRL data will allow plan sponsors, providers, and policymakers to identify areas of strength and weakness within the public-sector DC system and inform possible plan design, delivery, and communication solutions.

## NEXT STEPS

In addition to the 25 asset classes analyzed above, the PRRL Database also contains the following fund-type descriptors for the various asset classes:

- Active.
- Passive.
- Hybrid.
- Mutual fund.
- Commingled fund separate account.
- Multiple vehicle types.
- White label.
- Multi-manager fund.
- Environmental, social, and governance (ESG) fund.

A forthcoming report will reveal how these various organizations and approaches impact participant investment choice.

We will also be performing additional analysis to identify the influence of plan type on asset allocation.

We are now in the process of collecting data for year-end 2020 and anticipate inclusion of additional plans with detailed asset allocation information. We expect an increased sample size will provide sufficient information to investigate the impact of eligibility for defined benefit plans and Social Security as well as the influence of auto-enrollment on DC plan participation.

### ONLINE APPENDIX

An online appendix containing additional information on each of the 25 asset classes analyzed in this report is available at [https://www.nagdca.org/wp-content/uploads/2021/05/PRRL\\_Asset\\_Allocation\\_Appendix.pdf](https://www.nagdca.org/wp-content/uploads/2021/05/PRRL_Asset_Allocation_Appendix.pdf). The 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup> percentile are provided for each asset class by age for all participants with a non-zero investment. This organization enables a more detailed assessment of how these asset classes are used, conditional upon participant investment in a particular asset class.

### REFERENCES

Petersen, Matt, and Jack VanDerhei, "The State of Public Sector DC Plans: A First Look at the PRRL Database," *PRRL Research Study No. 2*, February 25, 2021

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### About PRRL

The Public Retirement Research Lab is a retirement industry-sponsored collaborative effort of the National Association of Government Defined Contribution Administrators ([NAGDCA](#)) and the Employee Benefit Research Institute ([EBRI](#)). The PRRL mines data from its Public Retirement Research Database, the first-ever database specific to public sector plan- and participant-level defined contribution data, to produce unbiased, actionable findings to better inform public plan design, management, innovation, and legislation. The overarching goal of the PRRL is to enhance understanding of the design and utilization of public sector defined contribution retirement plans as a means of helping public sector employees achieve a secure retirement. To learn more, visit [www.prrl.org](http://www.prrl.org).

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