



Defined Contribution Plans Advisory Committee (DCPAC) Meeting

1111 E. Main Street, Richmond, VA 23219

Thursday, 12/1/2022

1:00 - 3:00 PM ET

1. Welcome & Introductions

2. Meeting Minutes

-- Adoption of the Minutes from the September 8, 2022 Meeting

DCPAC Minutes 09-08-2022 - Page 2

3. Administration

DCPAC Annual Cost Update December 2022 - Page 7

2022Q3 Administrative Summary - Page 11

Report on the ORPHE Annual Employer Update 9.29.22 - Page 36

a. Annual Administrative Expense Reports

b. Administrative Reports & Communications

i. DC Plans and Hybrid Plan Update

ii. ORPHE

-- ORPHE Employer Update Report

iii. DC Plans Recordkeeper RFP Update

4. Investments

Final DC Investments 12-1-22 slide deck - Page 38

DC Proxy Voting RBA - Page 63

a. Performance Reports

b. CEM Defined Contribution Plans Survey

c. RBA – Approve Additional Methods of Proxy Voting for the Defined Contribution Plans

5. Other Business

RBA - Appoint DCPAC Member - Page 64

Harris Bio - Updated - Page 65

a. Code of Ethics

b. RBA -- Appointment of DCPAC Member

c. Discussion of New Ideas

6. 2023 Meetings

a. ORPHE Annual Employer Update (not a meeting of the DCPAC)

b. 2023 Meetings

i. March 30, 2023 at 1:00 pm

ii. June 1, 2023 at 1:00 pm

iii. September 7, 2023 at 1:00 pm

iv. November 30, 2023 at 1:00 pm

Minutes

The Defined Contribution Plans Advisory Committee (DCPAC) of the VRS Board of Trustees met on September 8, 2022, with the following members present:

Committee Members:

Hon. J. Brandon Bell, II, Chair
Dr. Susan T. Gooden
Ravindra Deo
Shannon T. Irvin
Brenda O. Madden
Arun S. Muralidhar
David A. Winter

Members of the Board of Trustees:

John M. Bennett*

VRS staff members in attendance:

Jeanne Chenault, Michael Cooper*, Alicia Diggs*, Jon Farmer*, Josh Fox*, Brian Goodman, Kelley Harlow*, Kelly Hiers, KC Howell, Robert Irving, Andrew Junkin*, Ryan LaRochelle*, Teresa Nguyen*, Rebecca Nicholas*, Laura Pugliese, Steven Ramirez, Kristy Scott*, Michael Scott, Jennifer Schreck, Jacob Schwartz*, Ashley Spradley*, Bridgette Watkins, and Cindy Wilkinson.

Also in attendance were Brian McCleave, Empower; Andrew Ness*, Sageview; Kimberly A. Sarte, JLARC; Maxwell Cason*, Governor's Office and Laura Albanese*, FIN-news.

**Attended remotely*

The meeting convened at 1:02 p.m.

Chairman Bell welcomed committee members, board members, VRS staff, representatives from other stakeholder groups and members of the public.

Approval of Minutes

Upon a motion by Dr. Gooden, with a second by Mr. Muralidhar, the minutes of the June 2, 2022 meeting were approved by voice vote.

Governing Documents Update

Brian Goodman, Legal Affairs & Compliance Coordinator, provided an overview of staff recommended changes to the Defined Contribution Incentive Plan for VRS Personnel (DCIP) Plan Document and the DCIP Master Trust.

Mr. Goodman provided background on the DCIP governing documents and the rationale for the changes to the plan document. In connection with its review of all VRS defined contribution plans, outside benefits counsel (Ice Miller) went over the provisions of the DCIP, recommending that an amended and restated document be prepared and adopted by the Board. The plan document contains technical changes and is updated to reflect the provisions of recent legislation affecting qualified plans such as the SECURE Act and changes to the required minimum distribution (RMD) rules. Also, the proposed plan document's format and structure is consistent with that of the other defined contribution plan documents, which were amended and restated recently with the collaboration of outside benefits counsel and VRS staff.

Mr. Goodman finished his presentation with a focus on the amendment to the DCIP master trust. VRS staff also consulted with outside benefits counsel to determine what changes would be needed to the master trust relating to the amended and restated DCIP. The resulting amendment accounts for the recent name change to the plan as well as adding a provision to cover the return of mistaken contributions without violating the trust. Finally, the amendment strengthens the language in the trust regarding its compliance with the IRS separate accounting requirement. Outside counsel's recommendations are designed to provide additional assurance that VRS does and will continue to comply with state and federal law with respect to the master trust.

RBA: Approve Amended and Restated DCIP Plan Document and Approve First Amendment to DCIP Master Trust

Upon a motion by Mr. Deo, with a second by Ms. Madden, the RBA was recommended for approval by the Board of Trustees by voice vote.

Administrative Reports and Communications Update

Kelly Hiers, DC Plans Administrator, provided an update on the VRS Defined Contribution Plans for the second quarter ending June 30, 2022. Ms. Hiers shared the total assets and accounts under management across all DC plans as of June 30, 2022.

DC Plans and Hybrid Plan Update

Ms. Hiers started with an overview of total assets and accounts across all VRS managed plans. She noted that total accounts have crossed the 500,000 threshold which is an important milestone.

Ms. Hiers noted that VRS was the recipient of 2022 NAGDCA Leadership Awards in two categories which were COVID-19 Leadership and Participant Engagement & Communication.

Ms. Hiers provided an update on total assets and accounts in the COV 457 and Virginia Cash Match plans through June 30, 2022. She also provided an overview of total assets and accounts in the VRS Hybrid Retirement Plan and highlighted hybrid plan participation, noting the overall participation in hybrid voluntary contributions and number of hybrid plan members making voluntary contributions.

Ms. Hiers provided an overview of the population of hybrid plan members also eligible for the Commonwealth of Virginia 457 Deferred Compensation Plan. She shared that analysis is conducted on a quarterly basis to identify trends in this population and also to evaluate opportunities to improve communications and outreach efforts to members not maximizing voluntary contributions to the Hybrid 457 Plan and missing out on employer matching contributions.

Ms. Hiers provided an overview of the upcoming Auto-Escalation in 2023 for Hybrid Retirement Plan members non-currently making voluntary contributions or are not contributing the maximum 4%.

ORPHE Update

Ms. Hiers provided an overview by provider of total ORPHE assets, participants and average balances for the second quarter of 2022. Currently, 78% of new hires participate in the TIAA plan and 22% participate in the more recently offered DCP managed by MissionSquare.

Annual Review and Benchmarking

Ms. Hiers provided an analysis of the focus area for the second quarter of 2022 which was the annual review and benchmarking.

Ms. Hiers provided a review of MissionSquare performance. She noted that MissionSquare met all performance standards for 2021. Between FY 2017 through FY 2021, Hybrid 401(a) enrollments increased by 44% and Hybrid 457(b) enrollments increased by 13%. The Commonwealth of Virginia 457(b) plan saw a 6% increase in contributions with a notable 32% increase in self-enrollments into the plan. For participant engagement, account access usage showed consistent increases every year with a noteworthy 58% increase in text access usage between FY 2017 through FY 2021. Ms. Hiers finished with a summary of 2021 key accomplishments and future initiatives.

Ms. Hiers provided an overview of the TIAA Service Review. She noted that all TIAA performance standards were met for 2021. Total participants are over 8,200 and total assets are over \$950 million. She pointed out the Average Income Replacement Ratio was 83% which is a notable statistic for participants.

DC Plans Record Keeper RFP Update

Ms. Hiers finished her presentation with an update on the status of the DC Plans Record Keeper RFP. She noted the RFP has been drafted and is in the final review process. It is expected to be issued mid- to late September and will be open for eight weeks.

DC Plans Investments Update

Laura Pugliese, Portfolio Manager, Defined Contribution Plans, provided an overview of the Annual Investments Review as of June 30, 2022 to the DCPAC.

Ms. Pugliese noted that current CIO Ron Schmitz will be retiring effective January 2023. After a national search, the Board of Trustees appointed Andrew Junkin as the new CIO. Mr. Junkin began serving in early September.

Annual Investments Review

Ms. Pugliese provided an overview of the DCPAC duties and responsibilities as required by the Charter, including the duty to review trends and best practices, assist staff with identifying potential asset classes and investment strategies, review the VRS Defined Contribution Plans Investment Belief Statements and DC Plans Investment Policy Statements, and provide recommendations to the Board as needed. She noted Mr. Junkin will be given the opportunity to review the VRS DC Investment Belief Statements and the two DC Investment Policy Statements which may result in further review at a later date.

Ms. Pugliese provided an overview of the Annual Investments Review as of June 30, 2022 to the DCPAC. Total DC Plan assets in the unbundled DC Plans structure and bundled ORPHE structure was \$6.1 billion for the Fiscal Year ending June 30, 2022. She informed the Committee that no changes were made to either the unbundled DC plans investment platform or the bundled TIAA ORPHE Retirement Choice (RC) contract investment platform.

Ms. Pugliese provided a review of the investment performance and annual operating expenses in the unbundled DC Plans and bundled TIAA ORPHE RC contract for the Fiscal Year ending June 30, 2022.

Ms. Pugliese finished her presentation with DC investment trends and developments. Staff continues to monitor developments in the areas of default investment options, investment menu structure and offerings, behavioral finance, investment advice and managed accounts, and lifetime retirement income.

Ms. Pugliese shared with the Committee that the complete annual investment review package was included in the appendix.

Other Business

Discussion of New Ideas

There was no discussion of new ideas.

Upcoming Defined Contribution Plans Advisory Committee Meetings

Mr. Bell confirmed the following DCPAC meeting dates for 2022:

The next meeting of the DCPAC will take place on December 1st from 1:00 p.m. to 4:00 p.m.

The ORPHE Annual Employer Update is scheduled for September 29th, as required by the DCPAC Charter. This is not a DCPAC Committee meeting, however members may attend if interested.

Adjournment

Mr. Deo made a motion to adjourn the meeting. Dr. Gooden seconded the motion.

There being no further business, Mr. Bell adjourned the meeting at 2:34 p.m.

J. Brandon Bell, Chair
Defined Contribution Plans Advisory Committee

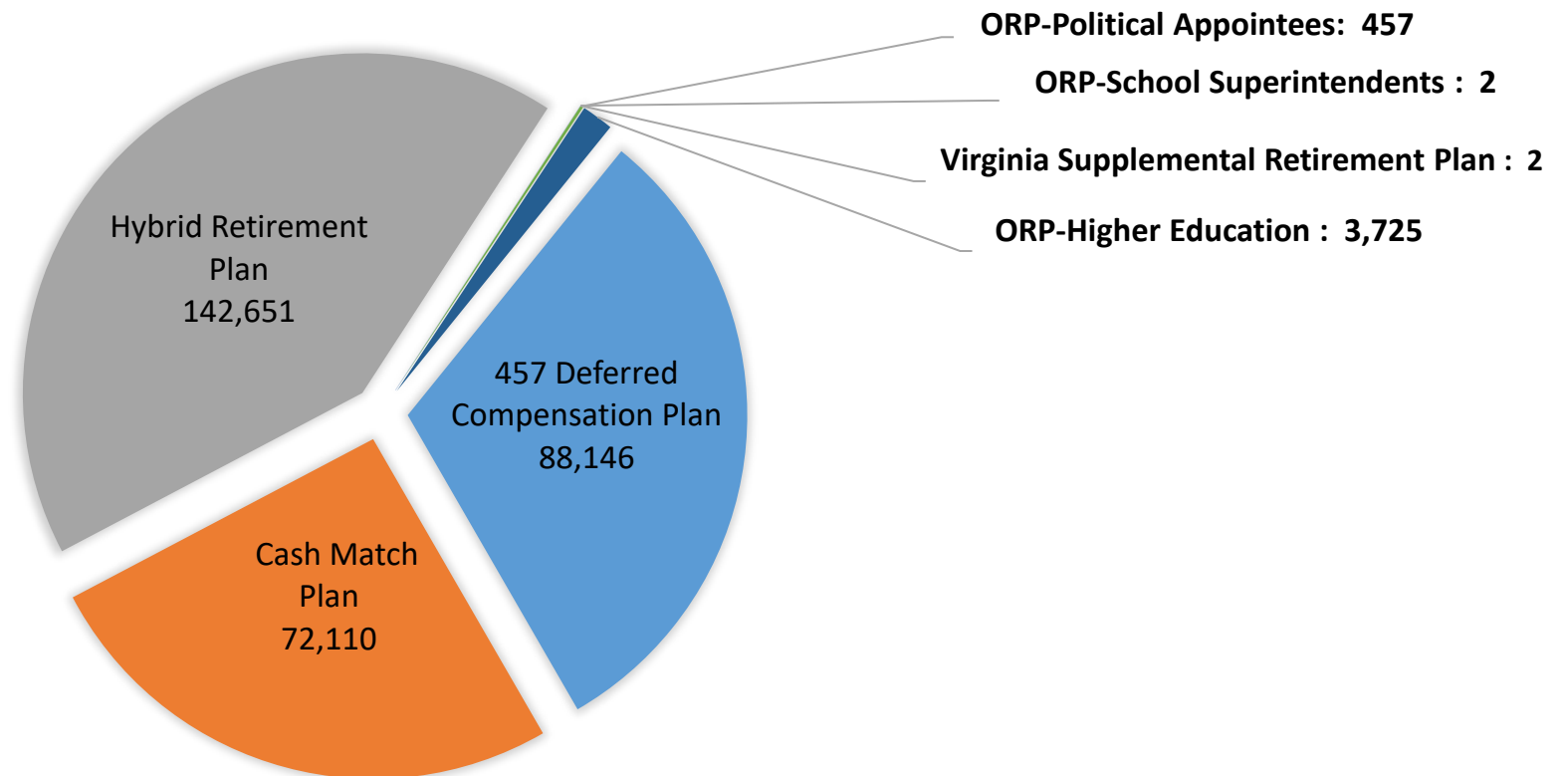
Defined Contribution Plans Annual Cost Update

Defined Contribution Plans Advisory Committee (DCPAC)
December 1, 2022

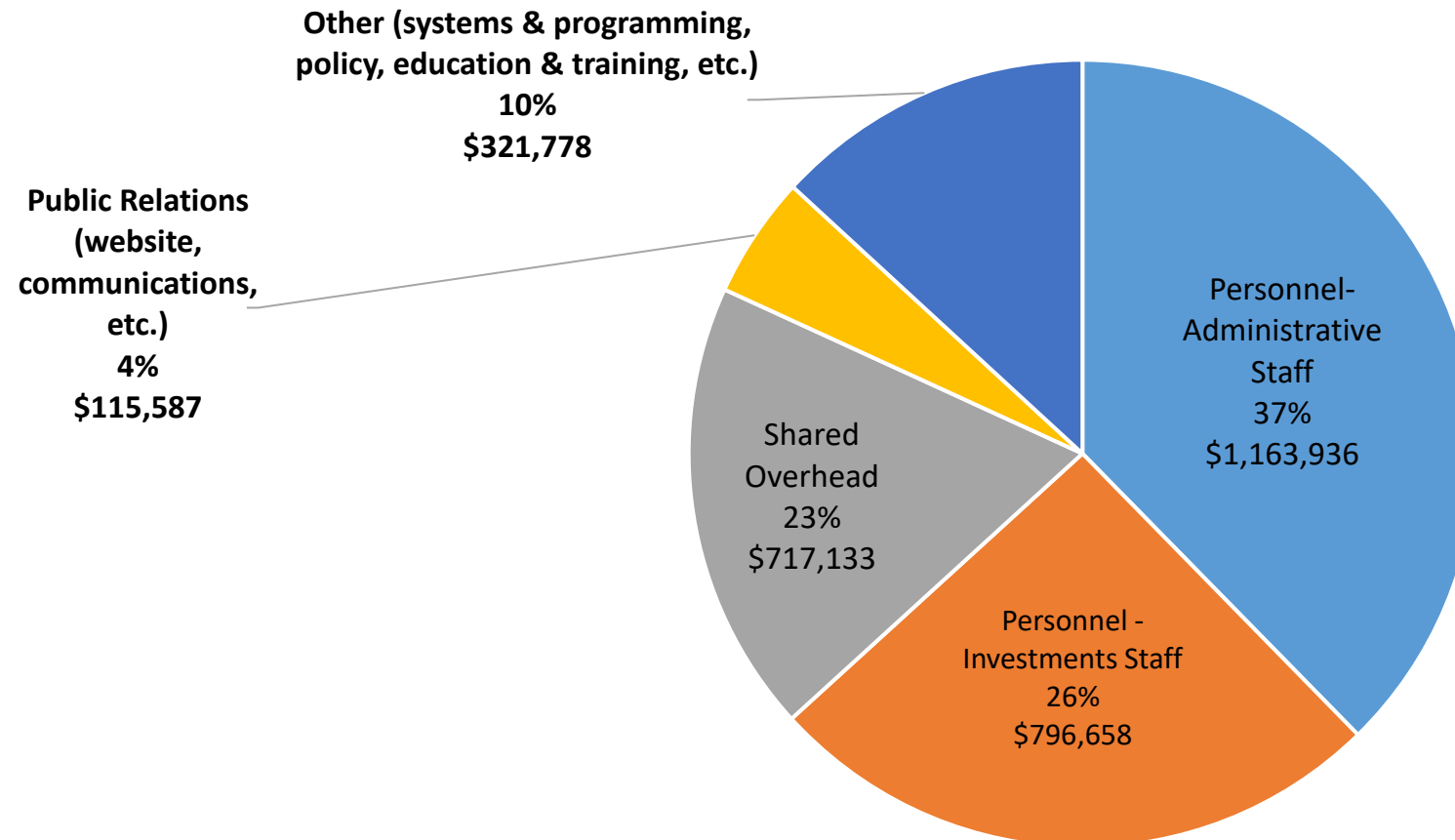


FY 2022 DC Plan Participant Counts

Summary of Participant Plan Counts: 307,093



Total administrative expenses of \$3.12 million; detailed as follows:



Cost Trends: FY 2018 - FY 2022

| | FY 2018 | FY 2019 | FY 2020 | FY 2021 | FY 2022 |
|-----------------------------|---------------------|--------------------|--------------------|--------------------|--------------------|
| COV 457 | \$705,921 | \$881,610 | \$834,892 | \$697,822 | \$626,698 |
| Participants | 79,397 | 80,189 | 87,033 | 87,570 | 88,146 |
| Annual Cost per Participant | \$8.89 | \$10.99 | \$9.59 | \$7.97 | \$7.11 |
| Cash Match | \$344,977 | \$432,190 | \$472,760 | \$569,290 | \$569,271 |
| Participants | 70,881 | 71,089 | 72,351 | 72,512 | 72,110 |
| Annual Cost per Participant | \$4.87 | \$6.08 | \$6.53 | \$7.85 | \$7.89 |
| Hybrid | \$617,632 | \$1,045,544 | \$1,320,393 | \$1,574,048 | \$1,450,372 |
| Participants | 85,179 | 102,845 | 118,279 | 126,518 | 142,651 |
| Annual Cost per Participant | \$7.25 | \$10.17 | \$11.16 | \$12.44 | \$10.17 |
| VSRP | \$0 | \$6,163 | \$0 | \$0 | \$0 |
| Participants | 2 | 2 | 2 | 2 | 2 |
| Annual Cost per Participant | - | - | - | - | - |
| ORPSS | \$4,357 | \$58 | \$14,332 | \$8,598 | \$7,624 |
| Participants | 2 | 2 | 2 | 2 | 2 |
| Annual Cost per Participant | - | - | - | - | - |
| ORPPA | \$100,627 | \$58,777 | \$38,364 | \$30,825 | \$33,009 |
| Participants | 334 | 372 | 383 | 381 | 457 |
| Annual Cost per Participant | \$301.28 | \$158.00 | \$100.17 | \$80.90 | \$72.23 |
| ORPHE | \$694,196 | \$450,527 | \$435,678 | \$449,629 | \$428,119 |
| Participants | 4,210* | 4,218 | 4,273 | 3,904 | 3,725 |
| Annual Cost per Participant | \$164.89* | \$106.81 | \$101.96 | \$115.17 | \$114.93 |
| Summary: | | | | | |
| Total Costs | \$ 2,467,710 | \$2,874,869 | \$3,116,419 | \$3,330,212 | \$3,115,092 |
| Total Participants | 240,005 | 258,717 | 282,323 | 290,889 | 307,093 |

*FY 2018 ORPHE figures include the withdrawal of the College of William and Mary (CWM) on 12/31/17



Virginia
Retirement
System

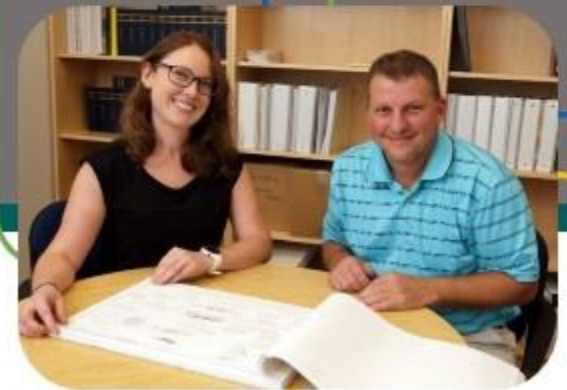
VRS Defined Contribution Plans

3rd Quarter 2022

(July - September)

Administrative Summary

December 2022

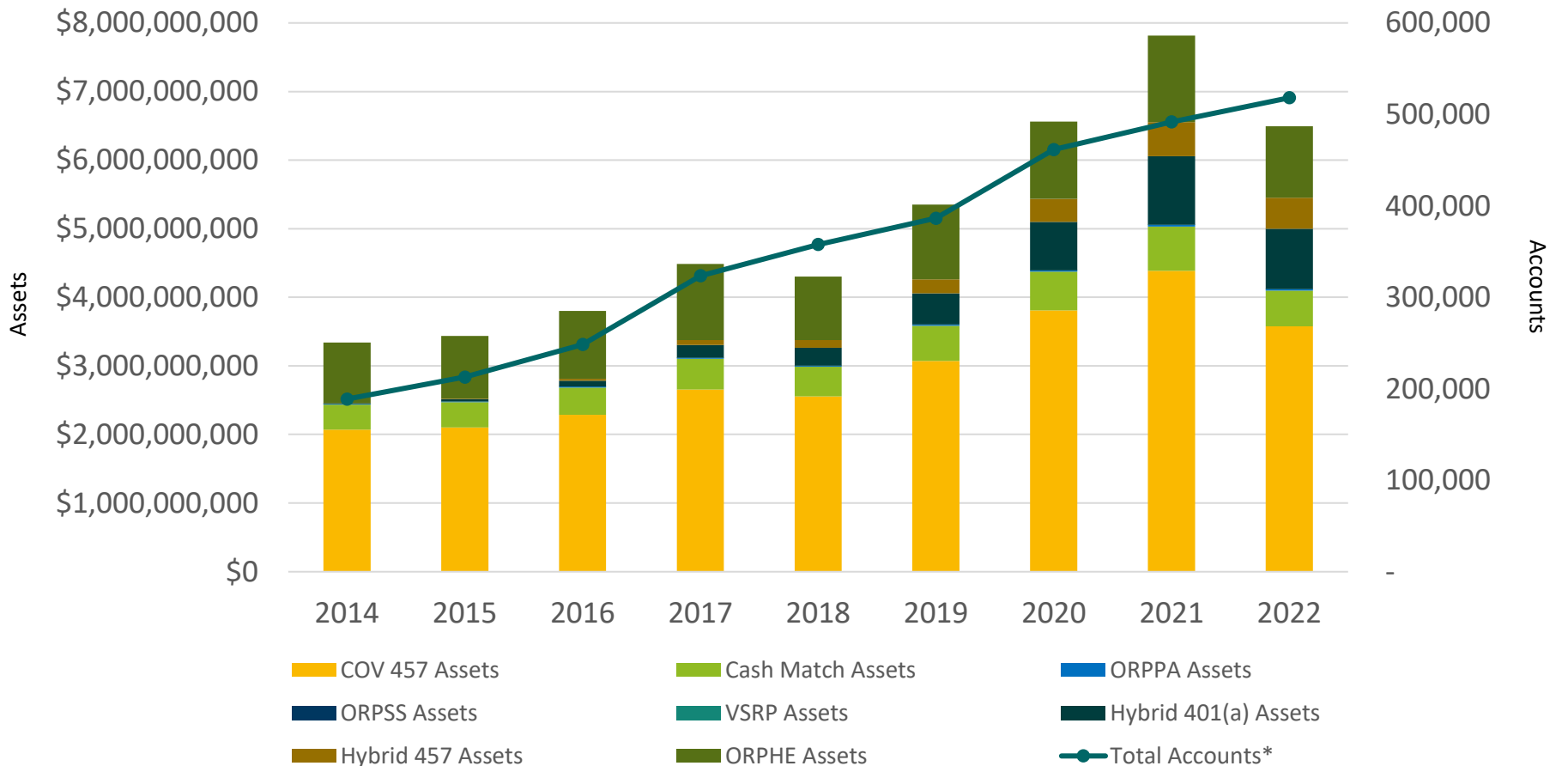


| Topic | Slide Number(s) |
|--|-----------------|
| General Updates | 3-4 |
| COV 457 & Cash Match Plans | 5 |
| Hybrid Retirement Plan | 6-9 |
| Focus: Increasing Enrollments and Contributions | 10-19 |
| Upcoming Events | 20 |
| ORPHE | 21-22 |
| DC Plans Unbundled Record Keeper Contract Update | 23-24 |

Total Assets and Accounts Over Time



| Totals as of 9/30/2022 | Assets | Accounts | Assets ↓ 3% Accounts ↑ 3% since June 30, 2022 |
|------------------------|-----------------|----------|---|
| | \$6,491,882,348 | 518,238 | |



Note: Except for current quarter, data reflects totals as of calendar year end and includes ORPHE selected providers and MissionSquare participant, beneficiary, forfeiture & reserve accounts. 2022 data is as of 9/30/2022.

*Does not indicate unique participants.

NAGDCA Art Caple President's Award

The Art Caple President's Award

Presented annually at the NAGDCA Annual Conference to a public sector retirement plan that has championed a participant-first mentality in building financial security for public employees.



Pensions & Investments

SUPER SAVINGS

VRS nabs Art Caple award for superhero campaign

The National Association of Government Defined Contribution Administrators bestowed its 2022 Art Caple President's Award for Excellence to the Virginia Retirement System, Richmond, and to its record keeper MissionSquare Retirement for a campaign last year encouraging 457 plan participants to make use of the savings auto-increase feature.

The Art Caple award is given out every year to a public sector retirement plan that has "championed the participant-first mentality" demonstrated by former NAGDCA President Mr. Caple in his "efforts to build financial security for public employees," the association said in an Oct. 3 release.

To boost savings in VRS' Commonwealth of Virginia 457 Deferred Compensation Plan and drive engagement with the plan's website, MissionSquare developed a superhero named Captain Save-It to inspire participant use of its SmartStep auto-increase feature, the release said.



As of June 30, assets in the Commonwealth of Virginia 457 Plan stood at \$3.7 billion.

Rasch Cousineau, a Portland, Ore.-based member of NAGDCA's Awards Committee Chair, explained in an email why the VRS campaign was so atten-

tion-grabbing:

"VRS won this year's Art Caple award in part because it used an innovative variety of communication methods to deliver impactful results." "From digital banners and newsletters to animations and splash-screen pop-ups, these methods all shared the goal of encouraging VRS participants to be their own 'savings hero,'" he said. Some 3,600 participants chose to "save more now," 461 participants chose to be "smart steppers" and 1,240 participants chose to "wait to save" for a total of 5,356 VRS participants improving their retirement readiness.

SmartStep allows participants to become "savings superheroes" by arranging for automatic annual increases in their contribution amounts. The campaign drove traffic to the plan's contributions web page, which included details about the SmartStep feature, and resulted in a 30% increase in page views over 2020, the release noted.

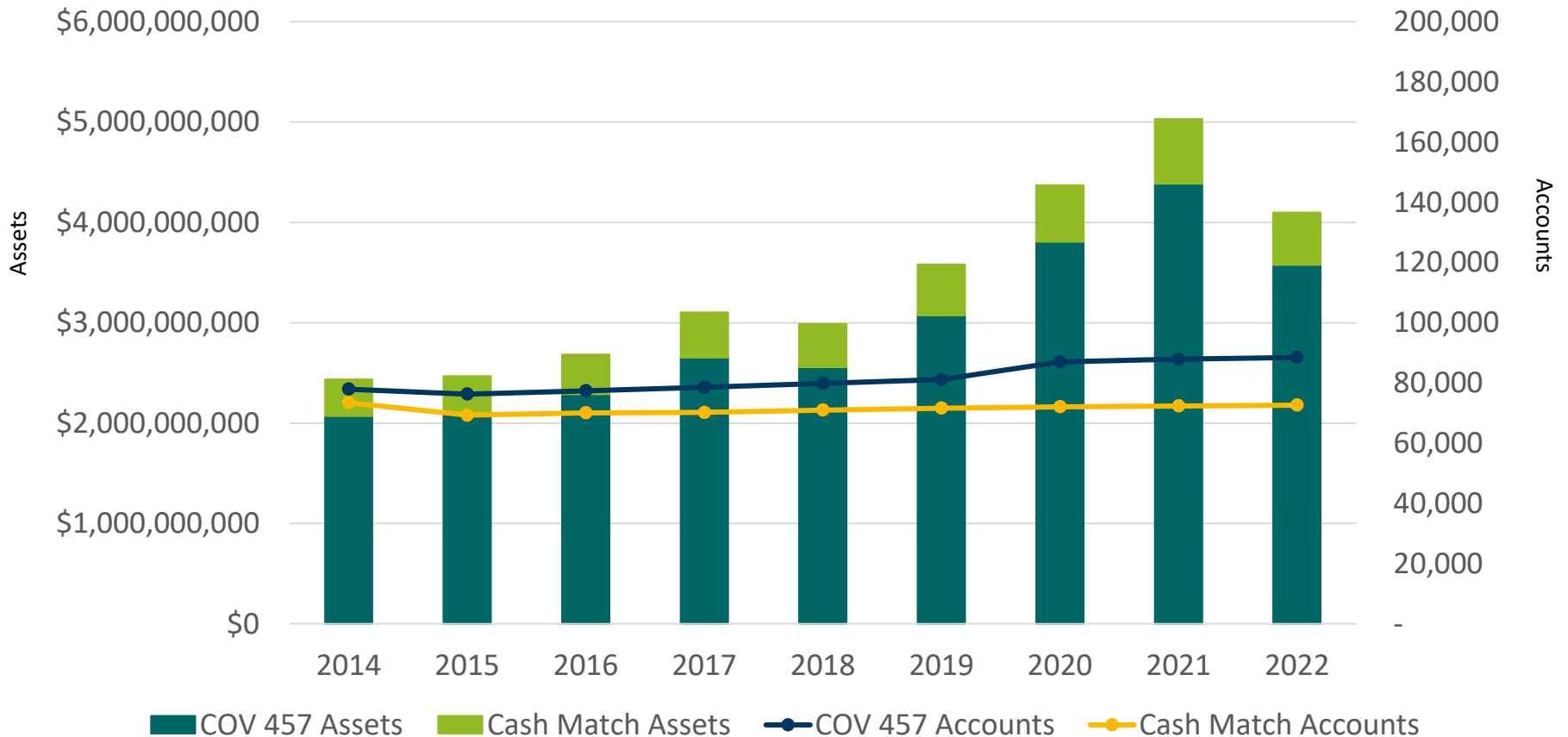
— PALASH GHOSH

COV 457/Cash Match Plan Assets and Accounts



| Totals as of 9/30/2022 | Assets | Accounts |
|------------------------|-----------------|----------|
| COV 457 | \$3,577,545,665 | 88,477 |
| Cash Match | \$520,738,081 | 72,648 |

Assets ↓ 4% since June 30, 2022



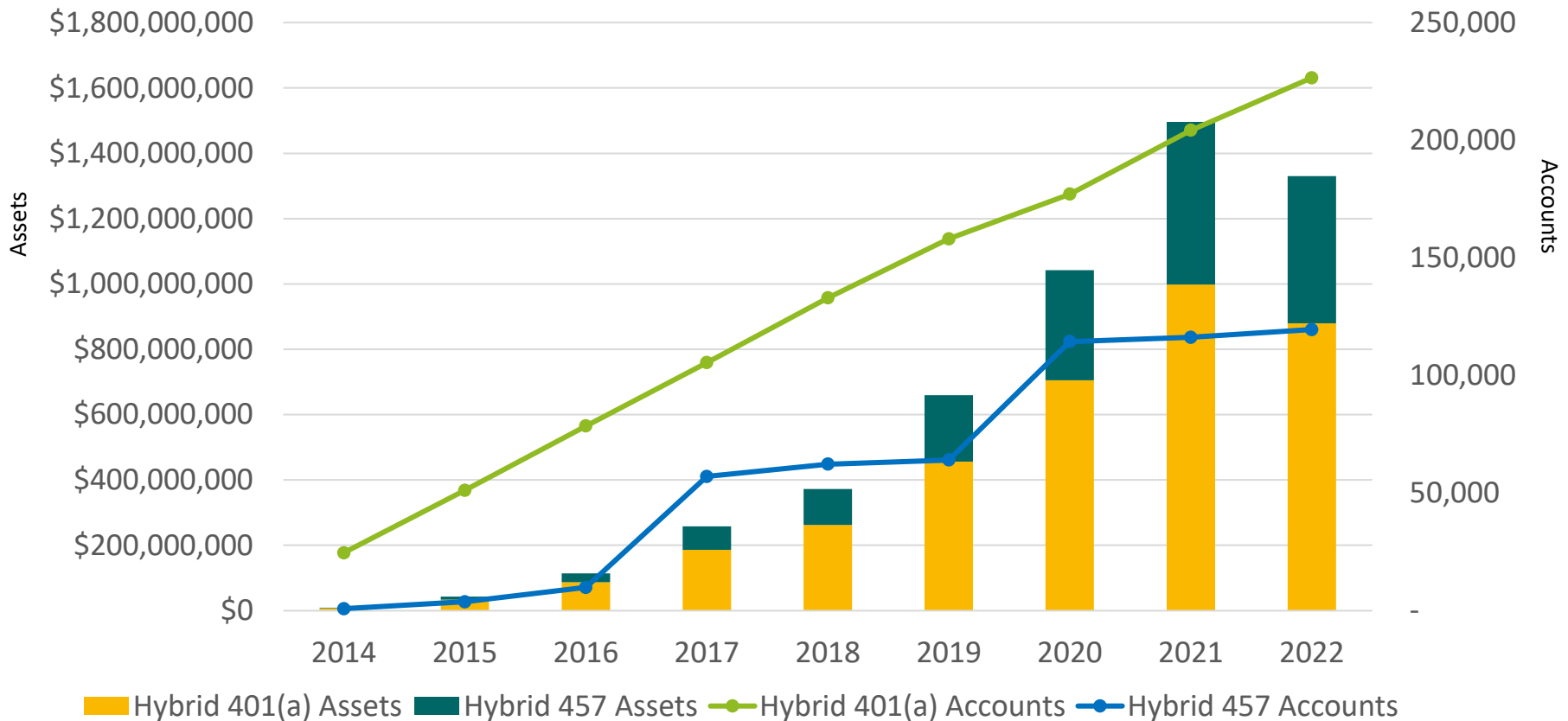
Note: Except for current quarter, data reflects totals as of calendar year end and includes MissionSquare participant, beneficiary & reserve accounts. 2022 data is as of 9/30/2022.

Hybrid Retirement Plan Assets and Accounts (DC only)



| Totals as of 9/30/2022 | Assets | Accounts |
|------------------------|---------------|----------|
| Hybrid 401(a) | \$879,319,885 | 226,521 |
| Hybrid 457 | \$451,241,751 | 119,521 |

Assets ↓ 2%
Accounts ↑ 4%
since June 30, 2022



Note: Except for current quarter, data reflects totals as of calendar year end and includes MissionSquare participant, beneficiary & forfeiture accounts. 2022 data is as of 9/30/2022.

Hybrid Retirement Plan Participation Highlights

Overall participation in
Hybrid Voluntary
Contributions – 57%

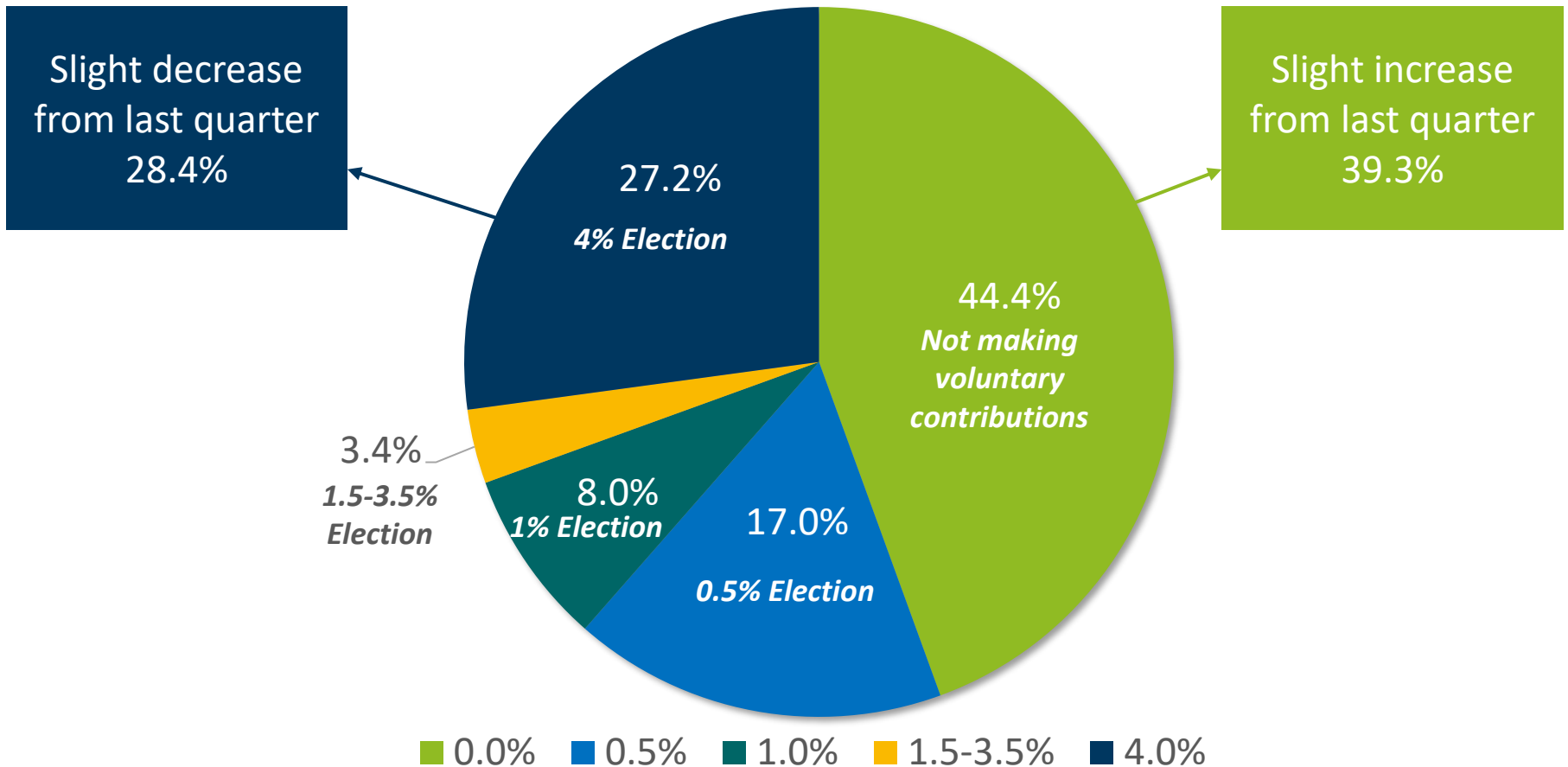
**Active Election
Participation – 32%**

Of members
making voluntary
contributions

**49% are maximizing at 4%
45% are at 1% or less**

Hybrid Retirement Plan Voluntary Contribution Elections

Voluntary contribution percentages for active hybrid plan members effective September 30, 2022



2023 Auto-Escalation Status

Cumulative Counts as of November 8, 2022

| | |
|---|-------|
| Elected SmartStep | 45 |
| Accepted .05% increase | 154 |
| Active Control (elected a different %) | 1,594 |
| Opted Out | 468 |

Cumulative Rates as of November 8, 2022

| | |
|--|------|
| Active Control Rate | 1.4% |
| Active Control and elected 4% Rate | 1.1% |
| Opt-Out Rate | 0.4% |

Eligible* population for auto escalation:

110,333



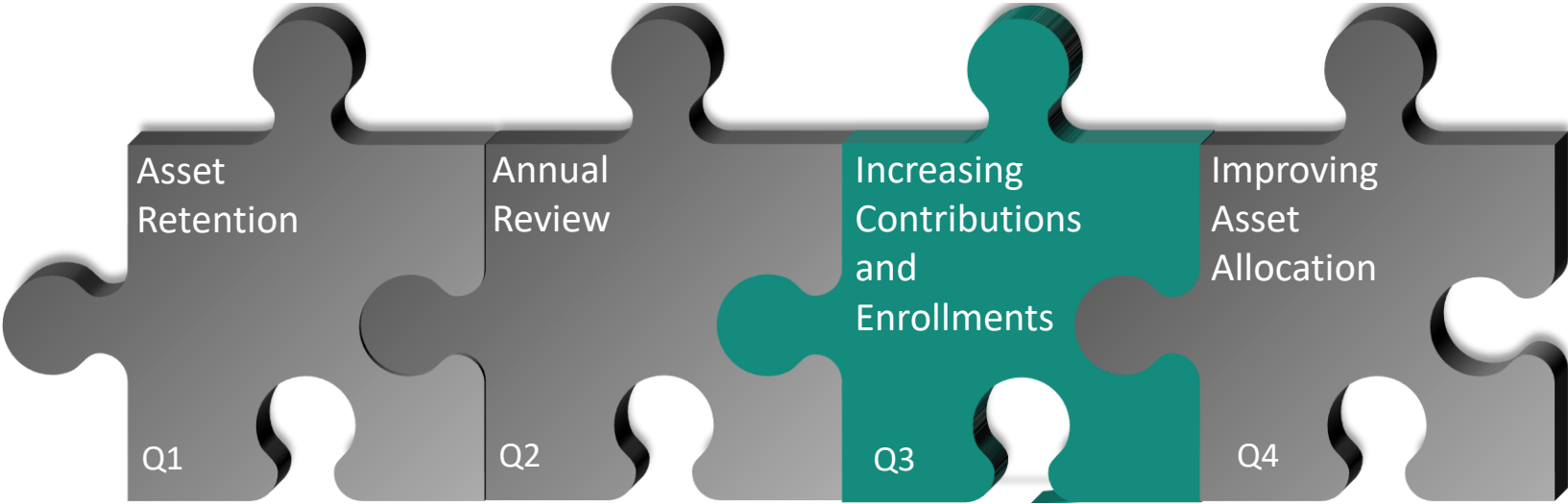
Auto Escalation Historical Rates

| | 2020 | 2017 |
|----------------|------|------|
| Active Control | 2.5% | 2.1% |
| Opt-Out | 1.0% | 3.1% |

*To be eligible, Hybrid members must be hired on or before September 1, 2022 and have a voluntary contribution of less than 4 percent.

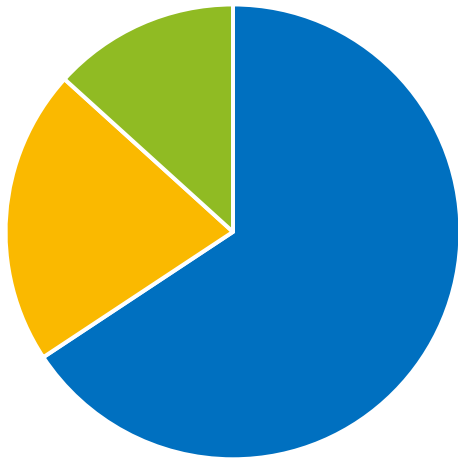
Note: Opt-out period is September 16, 2022 through December 15, 2022.

Increasing Contributions and Enrollments

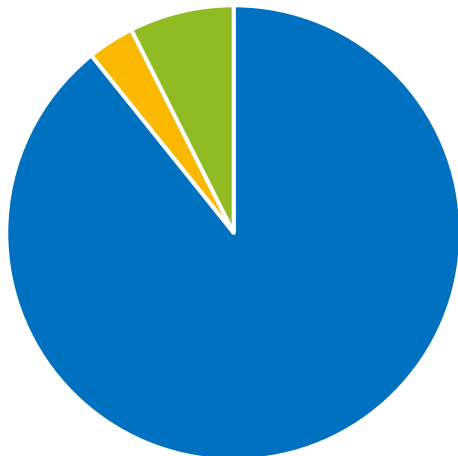


COV 457 Plan Participation

Eligible Participants



Participants with a Deferral



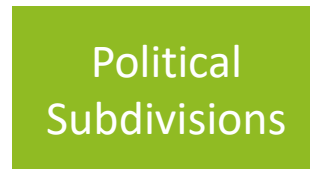
Participation Rate



40%



5%



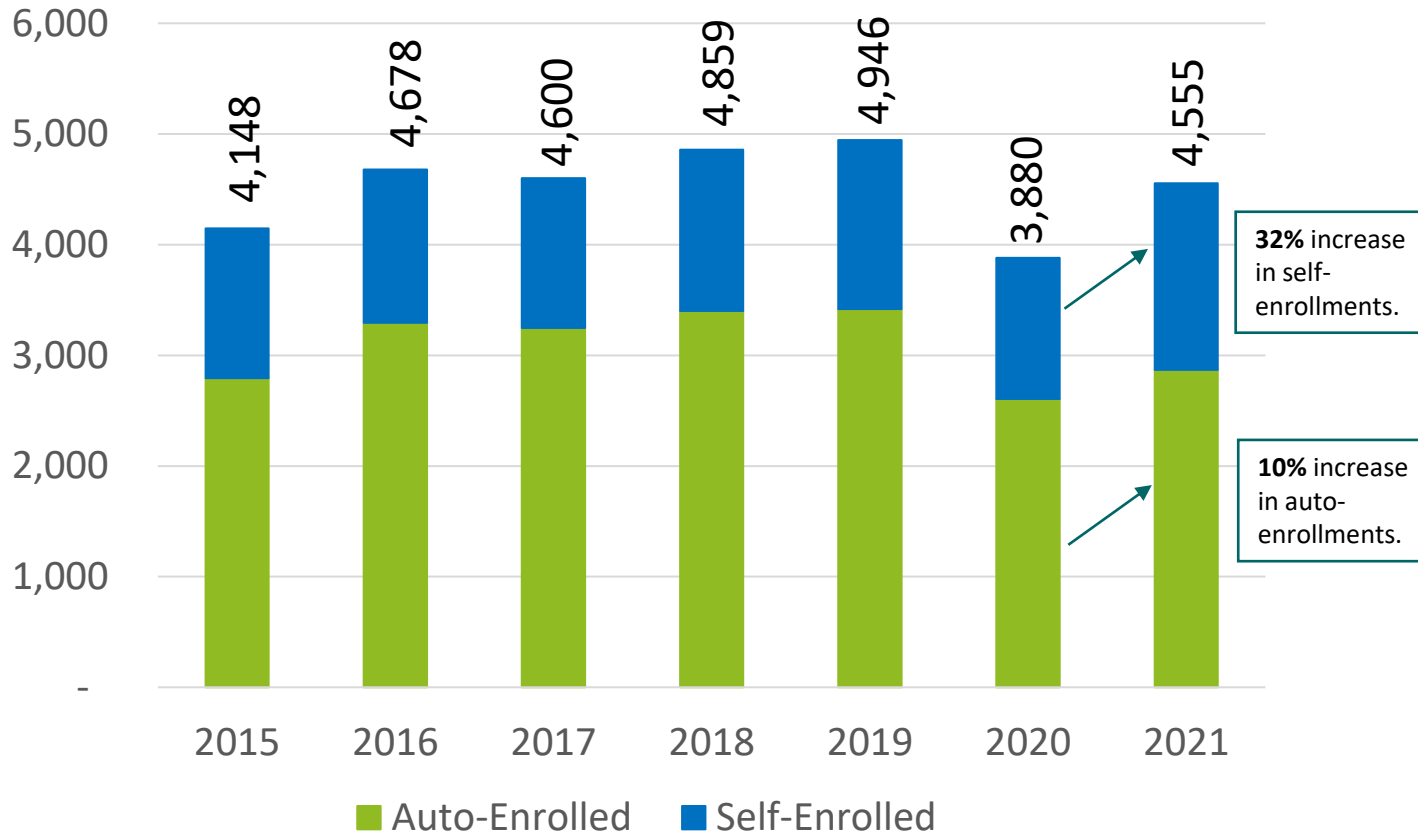
16%

COV 457 participation rates are impacted by a variety of factors.

- Higher education and school divisions have competing plans.
- Depending on employer type between 30% and 45% of eligible employees are also covered by the Hybrid Retirement Plan

COV 457 Plan New Enrollments

Increase enrollments in 2021 due to increased hiring, decreased auto-enroll opt-outs, and a significant increase in self-enrollments.

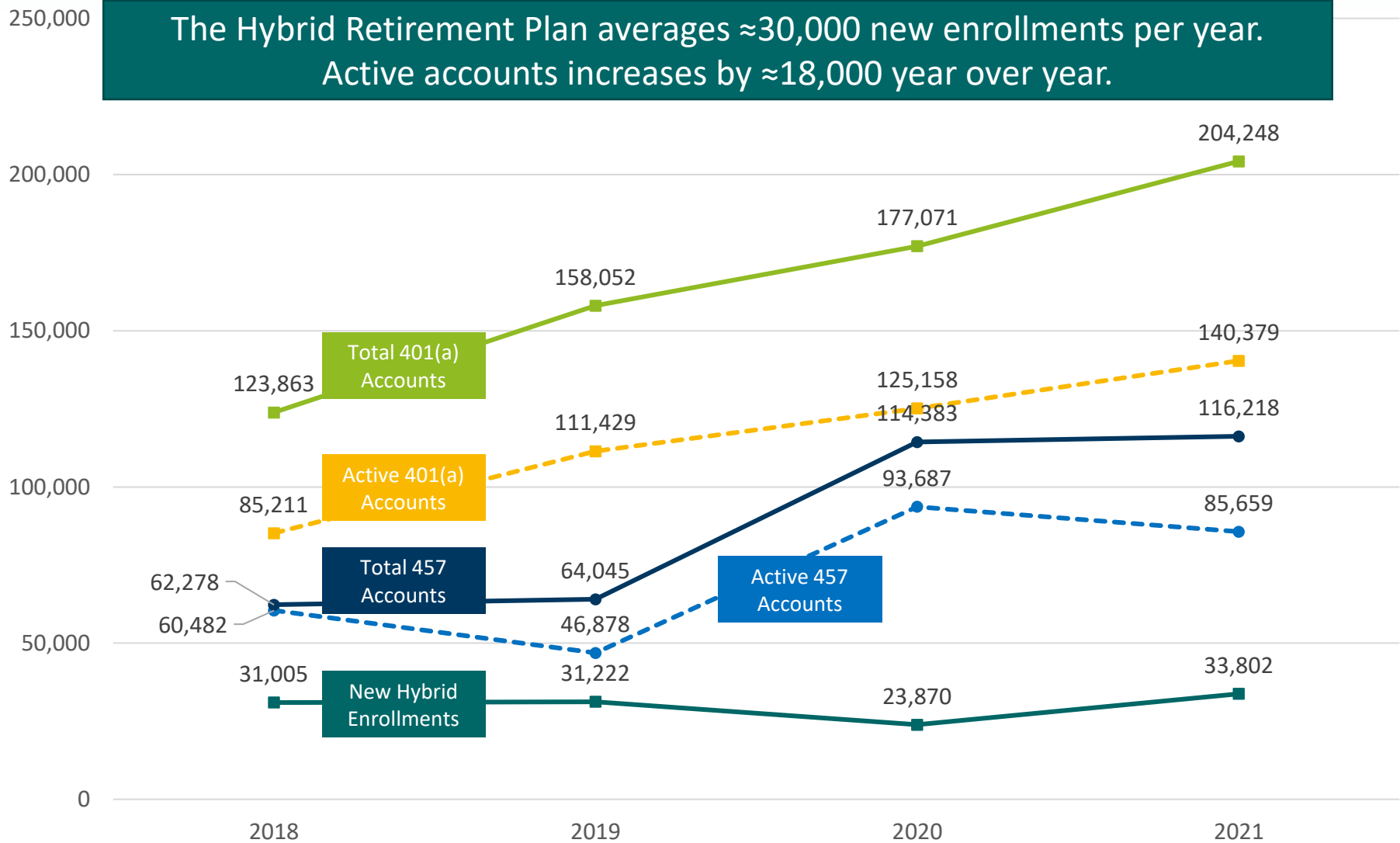


The auto-enroll opt-out rate increased steadily from approximately 7% in 2016 to 9.4% at the beginning of 2021.

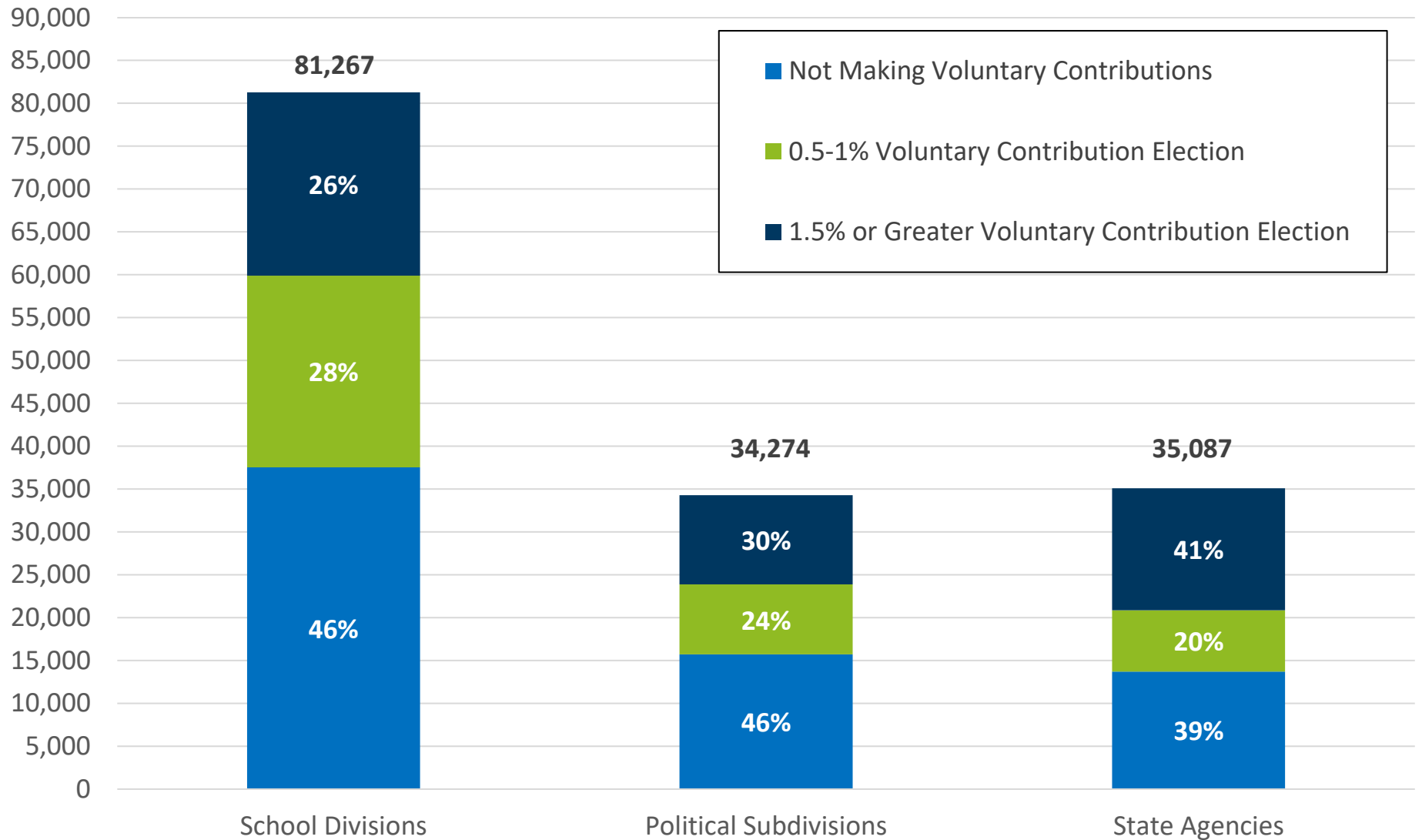
As of September 30, 2022, it has decreased to 7%.

Hybrid Enrollments and Accounts

The Hybrid Retirement Plan averages $\approx 30,000$ new enrollments per year. Active accounts increases by $\approx 18,000$ year over year.

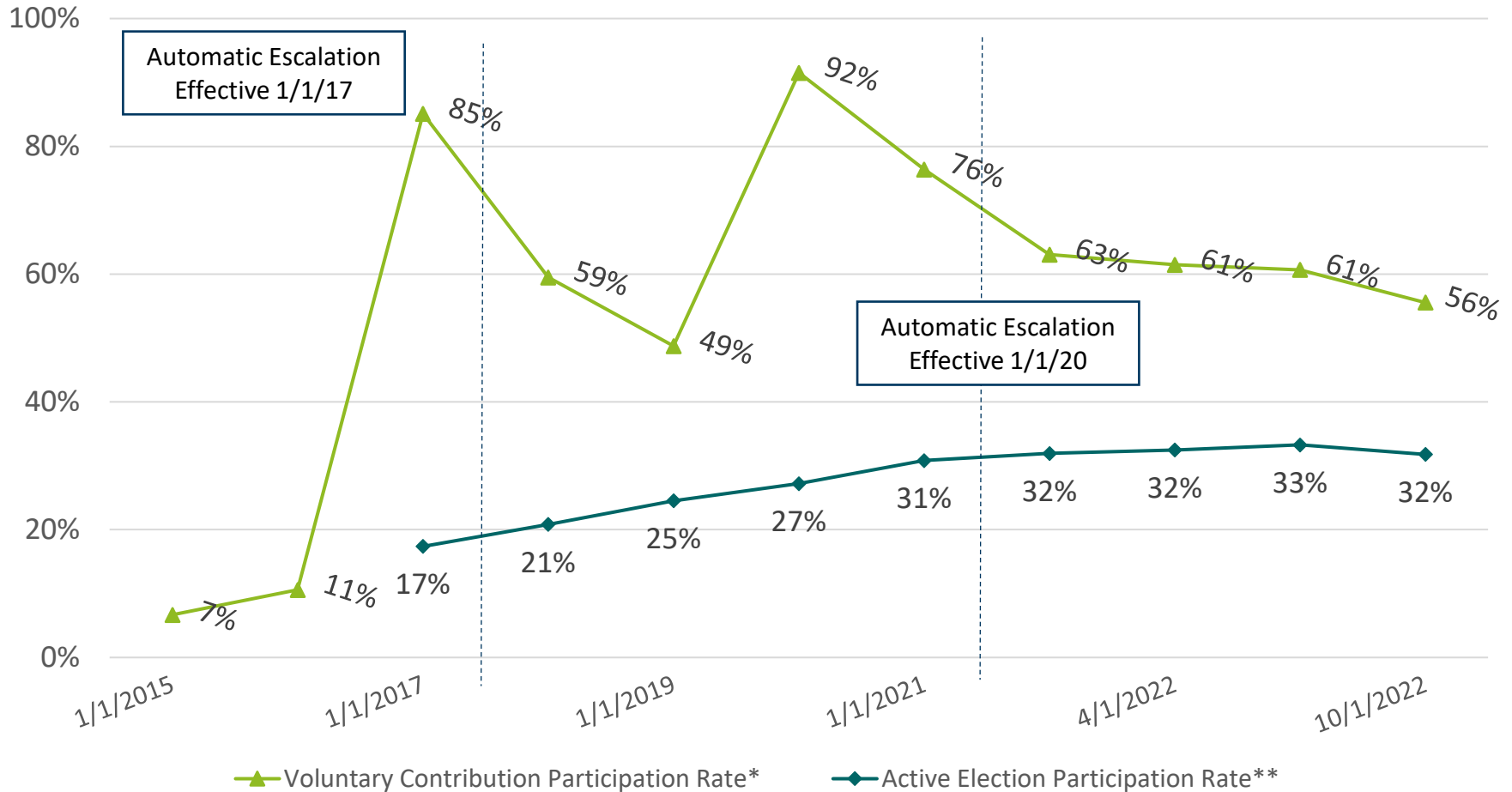


Hybrid Retirement Plan Members by Employer Type



Hybrid 457 Plan – Voluntary Participation Rate*

As of 10/1/2022, 56% of hybrid plan members (83,690 out of 150,628) have a voluntary contribution percentage with MissionSquare Retirement. 32% made an Active Election**.



*Except for current quarter, all data is as of 1/1 and represents elections made during Q4 of the prior year. Elections effective 10/1/22 were made during Q3.

**Includes members who had a self-selected voluntary election on file prior to the automatic escalation that occurred on 12/16/2019.

SmartStep

Participant-directed annual increases allow participants to save more automatically over time.



COV 457 Plan

- Launched 2018
- Approximately 2,800 participants have signed up
- Average Pre-tax step is \$57
- Average Roth step is \$18

Hybrid 457 Plan

- Launched 2017
- Approximately 3,700 members have signed up
- Average election is 1.09%

COV 457 Splash Screen

Be a savings superhero

The Commonwealth of Virginia 457 Deferred Compensation Plan makes it easy to be a savings superhero. Increase your contribution now and choose SmartStep to automatically increase your contribution each year, with less impact to your paycheck.



Select One:

I'm ready to increase my contribution to help improve my future savings outlook.

Save more now

I want to increase my contributions by a set amount each year automatically.

Choose a SmartStep month and amount

I am not interested in saving more for my future at this time.

Wait to save

8,459 participants*
took action after
seeing the screen
through September
30, 2022.

84% increased
contributions.

*Implemented 2/26/2021 and viewable by COV 457 eligible participants. If participant is also covered by the Hybrid Retirement Plan, the splash screen is only viewable if Hybrid contributions have already been maximized.

Hybrid Splash Screen

13,362 members* took action after seeing the screen through September 30, 2022.


97% increased contributions.

Take Action With Voluntary Contributions!

As a Hybrid Retirement Plan member, you are eligible for an employer match on your voluntary contributions. When you contribute 4 percent, your employer contributes 2.5 percent. The sooner you start saving, the better prepared you'll be for your future.

To take full advantage of the employer match, make the maximum 4 percent voluntary contribution to your Hybrid 457 Deferred Compensation Plan before contributing to the Commonwealth of Virginia 457 Deferred Compensation Plan or any other supplemental retirement plan offered by your employer. Also, contributions to multiple 457 plans count toward the IRS annual contribution limit.

MEET YOUR MATCH
Contribute **4%** for a **2.5%** savings match!

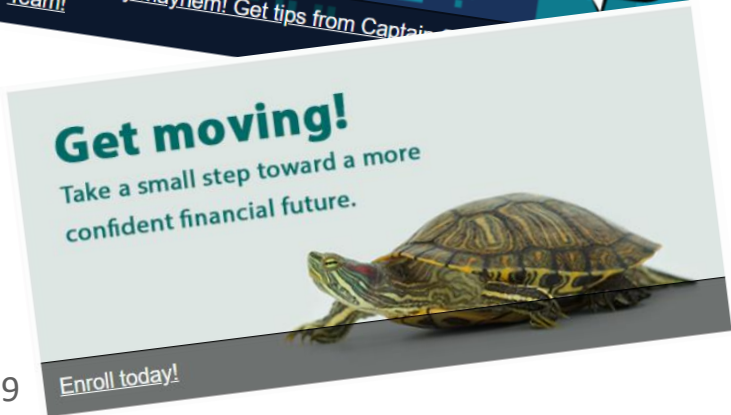


Select One:

| | | |
|---|---|--|
| I'm ready to save 4 percent and maximize my hybrid voluntary contributions. | I want to increase my hybrid voluntary contributions by a different amount. | I am not interested in saving more for my future at this time. |
| Save 4 percent now | Choose an amount to save | Wait to save |

Communication Efforts

- Videos, flyers, splash screens, web sliders, National Retirement Security Month, postcards, etc.



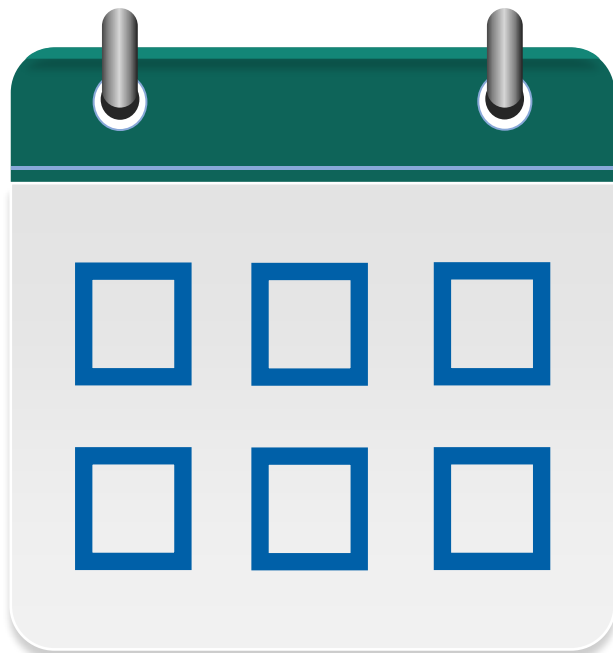
DCP Retirement Education Center

Search [] Filter by Topic [] Filter by Type [] Reset [] Help []

| | | | |
|---|--|--|---|
| Do-It-For-Me ▶ Watch to learn more about the Do-It-For-Me investment path . | Do-It-Myself ▶ Watch to learn more about the Do-It-Myself investment path. | Help-Me-Do-It ▶ Watch to learn more about the Help-Me-Do-It investment path . | Investing in Volatile Markets ▶ Watch to learn how to control your reactions when investing in volatile ma... |
| Investing Made Simple ▶ Watch to learn how DCP makes investing for your retirement easier. | Reach Your Retirement Goals ▶ Watch for tips to help make reaching your retirement goals a reality. | Cost of Delay in Your COV 457 Plan [] See why saving early in your COV 457 Plan matters. | Hybrid Paycheck Calculator [] Visualize the impact of contributions and other deductions on your paychec... |
| myVRS Benefit Estimator [] Estimate your retirement benefit for the defined benefit component of your... | myVRS Retirement Planner [] Use this interactive planner to estimate income and future expenses in ret... | Paycheck Calculator [] Use this calculator to visualize the impact of contributions and other deductions... | Required Minimum Distribution (RMD) [] See your current RMD and estimate future ones. |

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Upcoming Events



December 2022

- Recordkeeper RFP closes Dec. 2, 2022

January 2023

- Auto-escalated Hybrid contributions begin
- Participant QDIA* Notifications – 4th quarter statements

March 2023

- MissionSquare SS&C Transition (*tentative*)

Participant Reminders and Notifications

- Security Guarantee reminder
- MissionSquare Privacy Policy reminder
- Keep Your personal information current reminder
- QDIA* participant notifications
- Target Date Funds Update (targeted messaging)
- Financial checklist and contribution limit notifications

*Qualified Default Investment Alternative (QDIA) notifications are provided to all participants that have not made an active investment election. The Target Date Portfolios serve as the default investment for these plans.

Administrative Summary

ORPHE

| ORPHE Totals* | | | |
|-----------------|-----------------|------------------------|----------|
| | 6/30/2022 | 9/30/2022 | % Change |
| Assets | \$1,086,882,207 | \$1,041,303,699 | -4% |
| Participants | 10,520 | 10,597 | 1% |
| Average Balance | \$103,316 | \$98,264 | -5% |



| DCP | |
|-----------------|----------------------|
| | 9/30/2022 |
| Assets | \$128,533,891 |
| Participants | 2,302 |
| Average Balance | \$55,836 |

24% of new hires YTD have elected DCP as their provider.

| TIAA** | |
|-----------------|----------------------|
| | 9/30/2022 |
| Assets | \$912,769,808 |
| Participants | 8,295 |
| Average Balance | \$110,039 |

76% of new hires YTD have elected TIAA as their provider.

*Excludes deselected providers. Fidelity became a deselected provider effective 1/1/2020.

**Includes assets in GRA/RA and RC contracts.

2022 Open Enrollment: October

Only 5 provider changes were made – all changes to TIAA.



Annual Employer Update

21 unique employers were represented, including all four-year universities.

Topics covered

- Overview of plan assets, accounts, provider elections, annual fee disclosure.
- Administrative updates on open enrollment, compensation limits, employer and participant resources

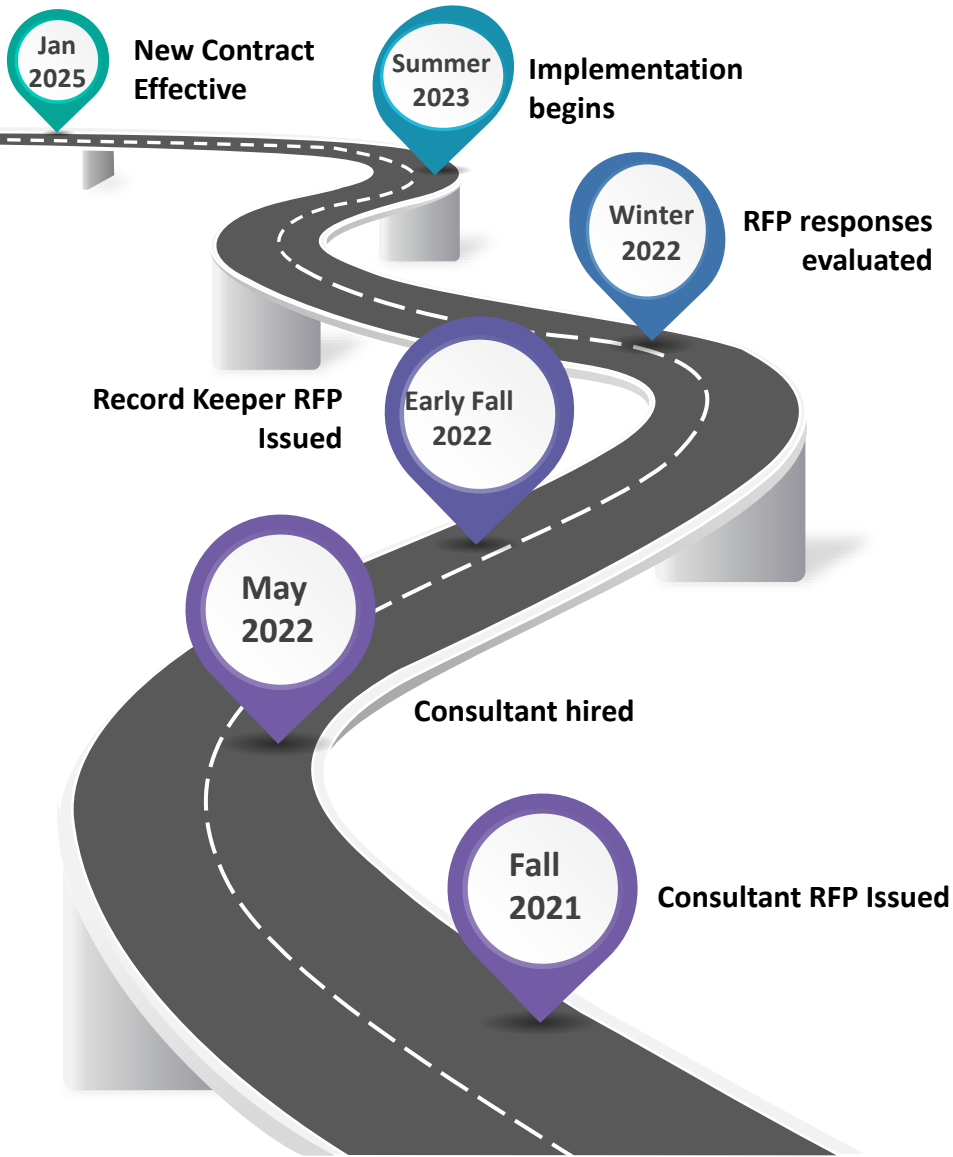
100% of survey respondents either agreed or strongly agreed that:

- **The information presented was important and useful.**
- **The webinar improved their knowledge of the topics presented.**

DC Plans Unbundled Recordkeeper Project Status



Unbundled Record Keeper Contract



Project Status

- RFP was issued on September 23, 2022

Posting included the following:

- Purpose and Background
 - Statement of Need Questionnaire
 - Proposal Preparation and Submission
 - Evaluation Criteria and Award
 - Terms and Conditions
 - Payment – Method and Schedule
 - Various attachments
- Responses are required by close of business on December 2, 2022.
 - Formal evaluation process will begin in January 2023.

Thank You!

The VRS Defined Contribution Plans team hosted the Optional Retirement Plan for Higher Education (ORPHE) Annual Employer Update for employers on Thursday, September 29, 2022.

The following agenda items were covered:

- Brandon Bell, VRS Board member and DCPAC Chair, welcomed participants and offered opening remarks.
- Kelly Hiers, Plan Administrator for the VRS Defined Contribution Plans, provided an overview of assets and accounts under management in the ORPHE in comparison to total plan assets and accounts across all of the unbundled plans. She also shared total assets and number of participants for the period ending June 30, 2022, including an overview of changes in asset size and number of participant accounts for the period 2014 through June 30, 2022. Ms. Hiers provided an update of ORPHE election data for DCP and TIAA, including the percentage of elections across all VRS ORPHE participating employers, current participants and recent new hires for the second quarter of 2022.

Ms. Hiers shared with employers an update on the distribution of the annual fee disclosure for ORPHE participants.

- Steve Cerreto, ORPHE Plan Officer for the VRS Defined Contribution Plans, presented an administrative update, including an overview of the open enrollment process in myVRS for participants, the application of the 401(a)(17) compensation limits, and various resources available to employers and participants.
- Rick Larson, Defined Contribution Plans Advisory Committee Member, provided closing remarks and adjourned the session.

Attendance

Representatives from 21 unique institutions from across the Commonwealth participated via webinar. A survey sent to participants following the webinar indicated that 100% of respondents either agreed or strongly agreed that the information presented was important and useful. Those who attended also received plan-related information via email following the webinar.

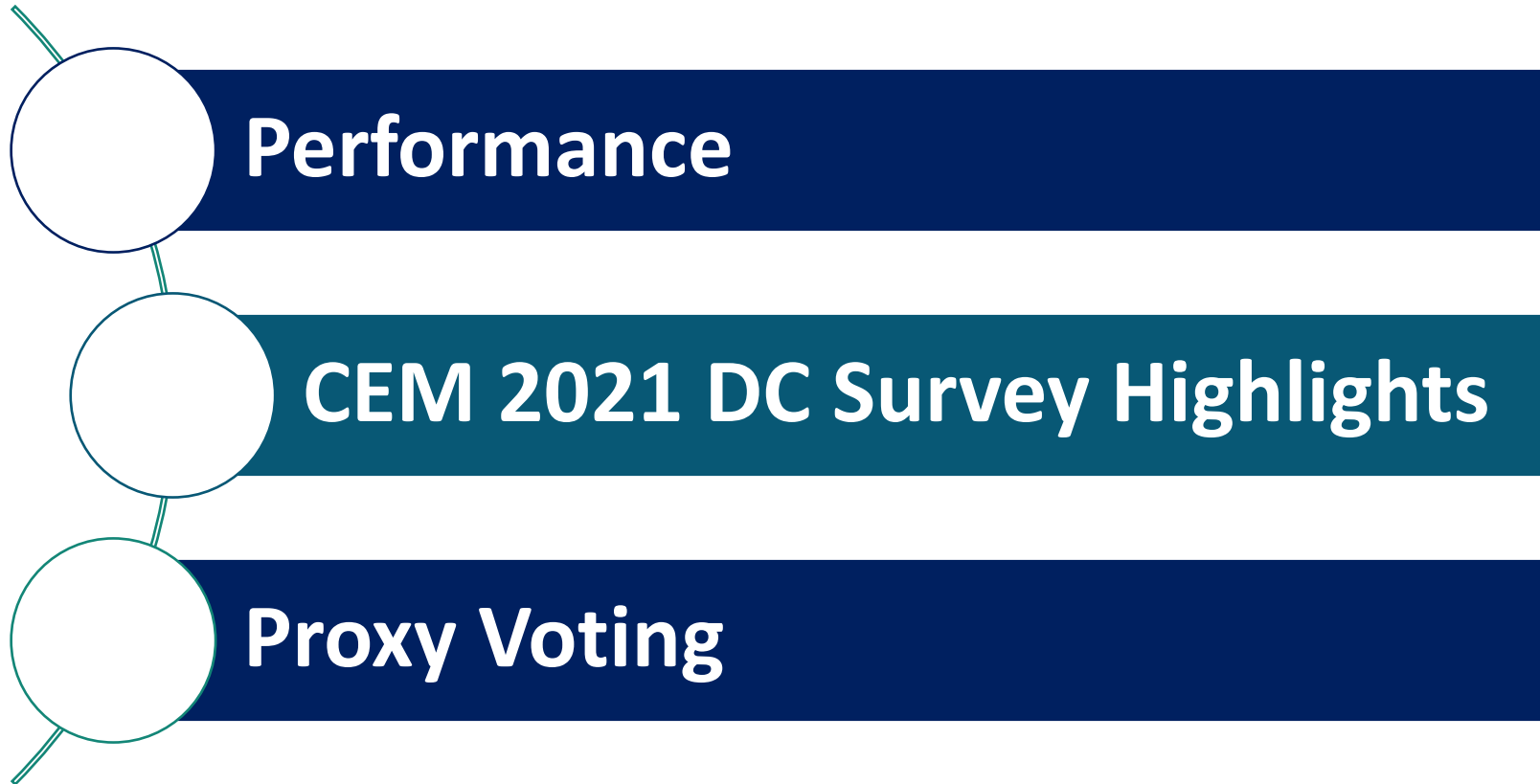
That concludes my report on the ORPHE Annual Employer Update.

Rick Larson, SPHR, SHRM-SCP
Member, VRS Defined Contribution Plans Advisory
Committee

DC Plans Investments

December 1, 2022



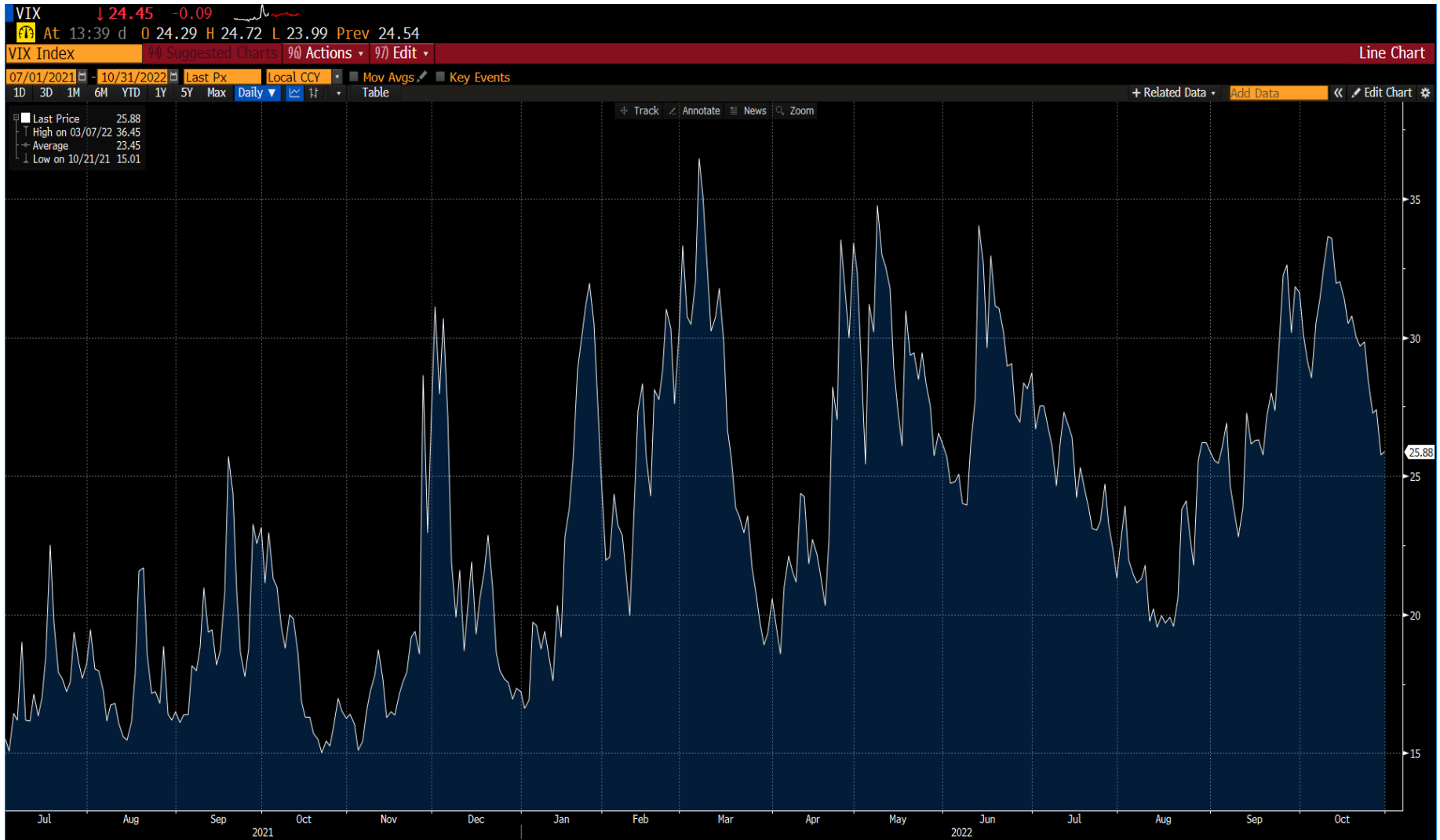




Performance



Volatility Index



Markets Ending 10/31/2022*

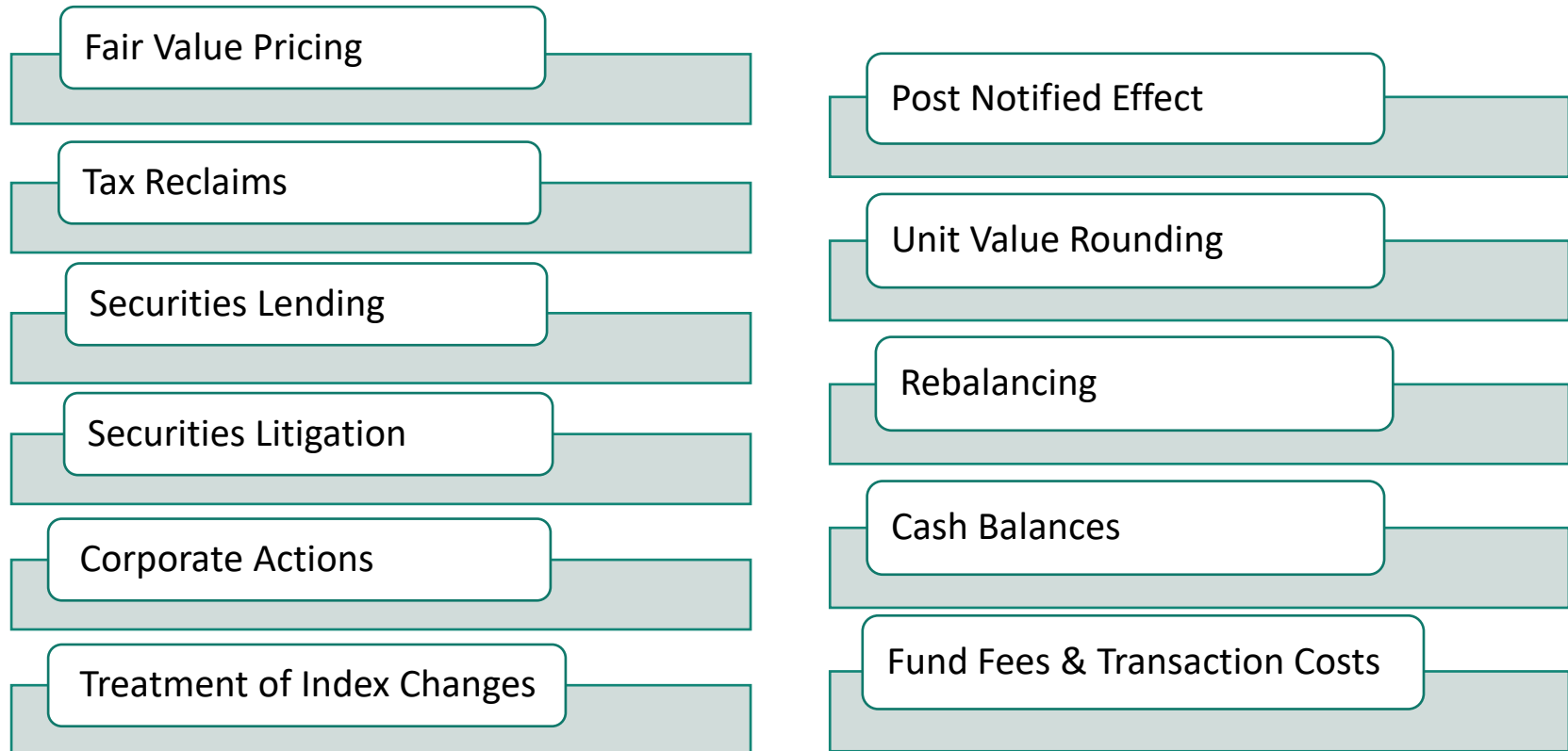
| Benchmark | YTD | 1 Year | 3 Years | 5 Years | 10 Years |
|---|---------|---------|---------|---------|----------|
| FTSE 3 Month Treasury Bill Index | 0.87% | 0.88% | 0.60% | 1.16% | 0.68% |
| Bloomberg U.S. Aggregate Bond Index | -15.72% | -15.68% | -3.77% | -0.54% | 0.74% |
| Bloomberg U.S. TIPS Index | -12.54% | -11.47% | 1.12% | 2.16% | 1.02% |
| ICE BofA U.S. HY BB-B Constrained Index | -11.73% | -10.94% | 0.11% | 2.03% | 4.02% |
| S&P 500 Index | -17.70% | -14.61% | 10.22% | 10.44% | 12.79% |
| Russell 2500 Index | -16.72% | -17.58% | 7.94% | 7.07% | 10.70% |
| MSCI ACWI ex-U.S. IMI Index | -24.71% | -25.17% | -1.44% | -0.56% | 3.46% |
| MSCI ACWI IMI Index | -21.15% | -20.22% | 4.77% | 4.99% | 7.96% |
| FTSE EPRA/NAREIT Developed Index | -27.80% | -24.95% | -6.32% | -0.17% | 3.09% |

Sources: MissionSquare, BNY Mellon and MSCI

* Returns greater than one year are annualized.

Major Sources of Differences Between Fund and Benchmark Index Performance

Performance Headwinds and Tailwinds



Defined Contribution Plans Advisory Committee Report
Unbundled Plans Investment Performance

Below are the totals for the period ending October 31, 2022. Returns greater than one year are annualized.

| Investment Options | 1 Month | 3 Months | YTD | 1 Yr | 3 Yrs | 5 Yrs | 10 Yrs / Since Inception ¹ | Fund Expense Ratio ² | Inception Date | Market Value | % of Market Value ²⁵ | % of Participants Selecting an Option ²⁶ |
|--|---------|----------|--------|--------|-------|-------|---------------------------------------|---------------------------------|----------------|------------------------------------|---------------------------------|---|
| | % | % | % | % | % | % | % | % | | \$ | % | % |
| Do-It-For-Me: Target Date Portfolios^{3,4} | | | | | | | | | | | | |
| Retirement Portfolio | 1.78 | -7.97 | -17.01 | -16.63 | 0.57 | 2.44 | 3.82 | 0.08 | 8/1/05 | 345,495,952 | 5.9 | 5.0 |
| Custom Benchmark | 1.73 | -7.91 | -17.00 | -16.56 | 0.54 | 2.42 | 3.79 | | | | | |
| Target Date 2025 Portfolio | 2.18 | -8.25 | -17.74 | -17.24 | 1.25 | 3.05 | 5.17 | 0.08 | 7/5/06 | 302,941,709 | 5.2 | 6.0 |
| Custom Benchmark | 2.12 | -8.17 | -17.74 | -17.19 | 1.23 | 3.02 | 5.11 | | | | | |
| Target Date 2030 Portfolio | 3.08 | -8.37 | -18.63 | -17.97 | 2.08 | 3.68 | 5.88 | 0.08 | 8/1/05 | 314,937,624 | 5.4 | 7.9 |
| Custom Benchmark | 3.00 | -8.27 | -18.62 | -17.93 | 2.05 | 3.64 | 5.80 | | | | | |
| Target Date 2035 Portfolio | 3.93 | -8.41 | -19.43 | -18.64 | 2.89 | 4.29 | 6.55 | 0.08 | 7/5/06 | 328,168,725 ²² | 5.6 | 9.1 |
| Custom Benchmark | 3.81 | -8.29 | -19.44 | -18.62 | 2.85 | 4.23 | 6.45 | | | | | |
| Target Date 2040 Portfolio | 4.76 | -8.43 | -20.21 | -19.28 | 3.58 | 4.80 | 7.12 | 0.08 | 8/1/05 | 282,545,361 | 4.9 | 9.2 |
| Custom Benchmark | 4.60 | -8.29 | -20.23 | -19.29 | 3.52 | 4.73 | 7.02 | | | | | |
| Target Date 2045 Portfolio | 5.51 | -8.36 | -20.81 | -19.80 | 4.18 | 5.21 | 7.59 | 0.08 | 7/5/06 | 270,227,234 | 4.6 | 10.4 |
| Custom Benchmark | 5.33 | -8.21 | -20.85 | -19.83 | 4.10 | 5.12 | 7.46 | | | | | |
| Target Date 2050 Portfolio | 5.97 | -8.17 | -21.10 | -20.04 | 4.50 | 5.42 | 7.86 | 0.08 | 9/30/07 | 272,901,310 | 4.7 | 12.0 |
| Custom Benchmark | 5.79 | -8.00 | -21.13 | -20.07 | 4.43 | 5.33 | 7.74 | | | | | |
| Target Date 2055 Portfolio | 6.11 | -8.08 | -21.13 | -20.07 | 4.58 | 5.46 | 8.01 | 0.08 | 5/19/10 | 321,278,683 | 5.5 | 15.8 |
| Custom Benchmark | 5.94 | -7.89 | -21.17 | -20.10 | 4.51 | 5.38 | 7.89 | | | | | |
| Target Date 2060 Portfolio | 6.11 | -8.08 | -21.14 | -20.08 | 4.56 | 5.45 | 6.25 | 0.08 | 11/17/14 | 160,090,442 | 2.8 | 12.6 |
| Custom Benchmark | 5.94 | -7.89 | -21.18 | -20.11 | 4.50 | 5.37 | 6.12 | | | | | |
| Target Date 2065 Portfolio | 6.07 | -8.10 | -21.18 | -20.11 | 4.46 | n/a | 5.00 | 0.08 | 9/23/19 | 15,763,159 | 0.3 | 3.4 |
| Custom Benchmark | 5.93 | -7.90 | -21.20 | -20.13 | 4.49 | n/a | 5.03 | | | | | |
| Help-Me-Do-It: Individual Options | | | | | | | | | | | | |
| Money Market Fund ^{5,6} | 0.28 | 0.72 | 1.18 | 1.21 | 0.77 | 1.35 | 0.82 | 0.08 | 11/1/99 | 108,827,651 | 1.9 | 1.9 |
| FTSE 3 Month Treasury Bill Index | 0.25 | 0.59 | 0.87 | 0.88 | 0.60 | 1.16 | 0.68 | | | | | |
| Yield as of 10/31/22: 3.30% ⁷ | | | | | | | | | | | | |
| Stable Value Fund ^{8,9} | 0.12 | 0.36 | 1.20 | 1.45 | 1.80 | 2.00 | 1.84 | 0.23 | 2/1/95 | 669,634,142 | 11.5 | 6.8 |
| Custom Benchmark ¹⁰ | 0.38 | 1.01 | 2.50 | 2.67 | 1.36 | 1.83 | 1.60 | | | | | |
| Yield as of 10/30/22: 1.58% ¹¹ | | | | | | | | | | | | |
| Bond Fund ¹² | -1.29 | -8.21 | -15.59 | -15.62 | -3.71 | -0.50 | 0.81 | 0.03 | 11/1/99 | 141,631,419 | 2.4 | 3.2 |
| Bloomberg U.S. Aggregate Bond Index | -1.30 | -8.23 | -15.72 | -15.68 | -3.77 | -0.54 | 0.74 | | | | | |
| Inflation-Protected Bond Fund ¹³ | 1.26 | -7.96 | -12.48 | -11.46 | 1.20 | 2.24 | 1.10 | 0.03 | 7/30/02 | 53,651,388 | 0.9 | 1.4 |
| Bloomberg U.S. TIPS Index | 1.24 | -7.97 | -12.54 | -11.47 | 1.12 | 2.16 | 1.02 | | | | | |
| High-Yield Bond Fund ¹⁴ | 2.59 | -3.25 | -10.02 | -9.43 | 1.36 | 2.86 | 4.48 | 0.39 | 5/31/04 | 46,557,200 | 0.8 | 1.7 |
| ICE BofA U.S. High-Yield BB-B Constrained Index | 2.98 | -3.71 | -11.73 | -10.94 | 0.11 | 2.03 | 4.02 | | | | | |
| Stock Fund ¹⁵ | 8.09 | -5.86 | -17.70 | -14.61 | 10.24 | 10.48 | 12.82 | 0.01 | 11/1/99 | 1,397,929,132 | 24.0 | 9.8 |
| S&P 500 Index | 8.10 | -5.86 | -17.70 | -14.61 | 10.22 | 10.44 | 12.79 | | | | | |
| Small/Mid-Cap Stock Fund ¹⁶ | 9.60 | -3.45 | -16.68 | -17.51 | 7.98 | 7.11 | 10.79 | 0.02 | 11/1/99 | 394,774,162 | 6.8 | 5.5 |
| Russell 2500 Index | 9.59 | -3.48 | -16.72 | -17.58 | 7.94 | 7.07 | 10.70 | | | | | |
| International Stock Fund ¹⁷ | 3.56 | -10.74 | -24.55 | -25.02 | -1.24 | -0.33 | 4.05 | 0.06 | 11/1/99 | 168,328,012 | 2.9 | 4.5 |
| MSCI ACWI ex-U.S. IMI Index ¹⁸ | 3.03 | -10.32 | -24.71 | -25.17 | -1.44 | -0.56 | 3.79 | | | | | |
| Global Real Estate Fund ¹⁹ | 3.15 | -15.56 | -27.27 | -24.34 | -5.59 | 0.52 | 3.86 | 0.08 | 10/1/02 | 86,516,833 | 1.5 | 2.9 |
| FTSE EPRA/NAREIT Developed Index | 2.99 | -15.66 | -27.80 | -24.95 | -6.32 | -0.17 | 3.09 | | | | | |
| VRSIP ²⁰ | -4.03 | -3.13 | -8.89 | -5.02 | 7.52 | 6.99 | 7.94 | 0.59 | 7/1/08 | 54,143,044 ²³ | 0.9 | 0.5 |
| VRS Custom Benchmark ²¹ | -5.97 | -5.20 | -14.26 | -11.59 | 3.77 | 4.82 | 6.58 | | | | | |
| VRSIP and benchmark returns are reported with a one month lag. [Return information shown is as of September 30, 2022.] [Market value as of September 2022 was 54,104,787.] | | | | | | | | | | | | |
| Do-It-Myself: Self-Directed Brokerage Account | | | | | | | | | | | | |
| TD Ameritrade | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | 85,098,623 | 1.5 | 0.2 |
| Total | | | | | | | | | | \$5,821,441,805⁴ | | |

- 1 If the fund was not in existence for 10 years, fund and corresponding benchmark returns shown represent performance from the since inception date.
- 2 Fund investment advisers may voluntarily agree to waive expenses. Expense waivers may be terminated at any time.
- 3 The Target Date Portfolios invest in units of BlackRock's LifePath Index Funds O. The LifePath Index Funds O invest in the master LifePath Index Funds F. The inception dates shown reflect the inception dates of the master LifePath Funds F. The inception dates for most LifePath Funds O were 12/9/11. The 2055 Fund's O inception date was 12/12/11, the 2060 Fund's O inception date was 1/2/15, and the 2065 Fund's O inception date was 9/23/2019. Returns prior to Funds' O inception dates are those of the Funds F with deductions taken for Funds O investment management fees.
- 4 Benchmarks are calculated using blended returns of third-party indices that proportionately reflect the respective weightings of the Portfolios' asset classes. Weightings are adjusted quarterly to reflect the Portfolios' asset allocation shifts over time. Indices currently used to calculate the custom benchmarks are: Russell 1000 Index, Russell 2000 Index, MSCI ACWI ex-U.S. IMI Net Dividend Return Index, Bloomberg U.S. Long Credit Bond Index, Bloomberg U.S. Intermediate Credit Bond Index, Bloomberg U.S. Long Government Bond Index, Bloomberg U.S. Intermediate Government Bond Index, Bloomberg U.S. Securitized: MBS, ABS, and CMBS Index, Bloomberg U.S. TIPS Index, FTSE EPRA/NAREIT Developed Index and the Bloomberg Commodity Index Total Return.
- 5 The Money Market Fund invests in units of BlackRock's Short-Term Investment Fund W. The inception data shown reflects the VRS Defined Contribution Plan's investment strategy inception date. Returns of the Fund from July 2012 through July 2016 represent performance of other BlackRock funds. Performance returns are linked.
- 6 An investment in a money market fund is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. Although the Fund seeks to preserve the value of your investment it is possible to lose money by investing in the Fund.
- 7 The current yield more closely reflects the earnings of the Fund than the total net return information. There is no guarantee that the Fund will earn the current yield in the future.
- 8 The inception date shown reflects the VRS Defined Contribution Plans investment strategy inception date.
- 9 Direct transfers from the Stable Value Fund to the Money Market Fund (considered a "competing fund") are not permitted. Before transferring to the Money Market Fund, participants must first transfer to a "non-competing" fund for 90 days. Optional Retirement Plan for Higher Education (ORPHE) participants who want to make a direct exchange to another ORPHE provider, must first exchange to a "non-competing" fund on the MissionSquare Retirement investment platform for 90 days.
- 10 Effective August 2016, the benchmark represents a hypothetical return generated by the monthly yields of actively traded U.S. Treasuries based on [50% 2- year maturity + 50% 3- year maturity] plus an annualized spread of 0.25% and is representative of the Fund's expected return profile, given how the Fund is managed and book value accounting treatment. Prior to August 2016 the custom benchmark was based on the monthly yield of actively traded U.S Treasuries with a 3-year maturity plus an annualized spread of 0.50%. The benchmark returns are linked.
- 11 The current yield more closely reflects the earnings of the Fund than the total net return information. There is no guarantee that the Fund will earn the current yield in the future.
- 12 The Bond Fund invests in units of BlackRock's U.S. Debt Index Fund M. The U.S. Debt Index Fund M invests in the master Fund F. The inception date shown reflects the VRS Defined Contribution Plans strategy inception date.
- 13 The Inflation-Protected Bond Fund invests in units of BlackRock's U.S. Treasury-Inflation Protected Securities Fund M. The U.S. Treasury Inflation-Protected Securities Fund M invests in the master Fund F. The inception date shown reflects the inception date of the master Fund F.
- 14 The High-Yield Bond Fund invests in units of JPMorgan's Corporate High-Yield Fund-Investment Class. The inception date shown reflects the date the current investment team at JPMorgan commenced management responsibility of the Fund.
- 15 The Stock Fund invests in units of BlackRock's Equity Index Fund F. Performance represents BlackRock's returns for the master Fund F with deductions taken for management fees negotiated by VRS and fund administrative expenses. The inception date shown reflects the VRS Defined Contribution Plans investment strategy inception date.
- 16 The Small/Mid-Cap Stock Fund invests in units of BlackRock's Russell 2500 Index Fund F. Performance represents BlackRock's returns for the master Fund F with deductions taken for investment management fees negotiated by VRS and fund administrative expenses. The inception date shown reflects the VRS Defined Contribution Plans investment strategy date.
- 17 The International Stock Fund invests in units of BlackRock's MSCI ACWI ex-U.S. IMI Index Fund F. Performance represents BlackRock's returns for the master Fund F with deductions taken for investment management fees negotiated by VRS and fund administrative expenses. The inception date shown reflects the VRS Defined Contribution Plan's investment strategy inception date. Returns from July 2012 through July 2016 represent performance of another BlackRock Fund. Performance returns are linked.
- 18 Effective August 2016, the performance benchmark is the MSCI ACWI ex.-U.S. IMI Index. It was the MSCI World ex-U.S Index from July 2012 through July 2016. The benchmark returns are linked.
- 19 The Global Real Estate Fund invests in units of BlackRock's Developed Real Estate Index Fund F. Performance represents BlackRock's returns for the master Fund F with deductions taken for investment management fees negotiated by VRS and fund administrative expenses. The inception date shown reflects the VRS Defined Contribution Plans investment strategy inception date.
- 20 The inception date shown reflects the date the VRS Investment Portfolio (VRSIP) was unitized.
- 21 The VRS Custom Benchmark is a blend of the asset class benchmarks at policy weights.
- 22 Includes Pending Account VRSIP amount of \$305,435.
- 23 Includes Preliminary Investment Portfolio Account - PIP amount of \$0.
- 24 Includes \$6,803,520 held in the administrative Special Accounts.
- 25 May not equal 100% due to rounding.
- 26 The data reflects the percentage of participants who selected a particular investment option as of September 30, 2022. There were 509,943 participant accounts as of September 30, 2022 across all unbundled DC plans.

All fund performance returns shown reflect all fund management fees and expenses, but do not reflect the Plan administrative fee charged by MissionSquare Retirement which would further reduce the returns shown.

All calculations assume reinvestment of dividends and capital gains. All returns are calculated in U.S. dollars. Performance returns are provided by BlackRock, Galliard Capital Management, JPMorgan, Bank of New York Mellon, and MissionSquare Retirement. Benchmark returns are provided by BlackRock, Russell/Mellon Analytical Services, Galliard, and MissionSquare Retirement. Although data is gathered from sources believed to be reliable, we cannot guarantee completeness or accuracy.

Plan Administrative Fee: An annual record keeping and communication services fee of \$30.50 is deducted from participant accounts on a monthly basis (approximately \$2.54 per month). Only one annual fee of \$30.50 is deducted from participant accounts for those participants participating in more than one Commonwealth of Virginia defined contribution plan.

Defined Contribution Plans Advisory Committee Report

TIAA RC Contract Investment Performance

Below are the totals for the period ending October 31, 2022. Returns greater than one year are annualized.

| Investment Options | 1 Month | 3 Months | YTD | 1 Yr | 3 Yrs | 5 Yrs | 10 Yrs / Since Inception ¹ | Fund Expense Ratio ² | Inception Date | Market Value | % of Market Value ¹⁹ | % of Participants Selecting an Option ²⁰ |
|---|---------|----------|--------|--------|-------|-------|---------------------------------------|---------------------------------|----------------|---------------|---------------------------------|---|
| | % | % | % | % | % | % | % | % | | \$ | % | % |
| Target Date Portfolios^{3,4} | | | | | | | | | | | | |
| BlackRock LifePath Index Retirement Fund O | 1.78 | -7.97 | -17.01 | -16.63 | 0.57 | 2.44 | 3.82 | 0.08 | 8/1/05 | 22,169,028 | 7.0 | 8.3 |
| Custom Benchmark | 1.73 | -7.91 | -17.00 | -16.56 | 0.54 | 2.42 | 3.79 | | | | | |
| BlackRock LifePath Index 2025 Fund O | 2.18 | -8.25 | -17.74 | -17.24 | 1.25 | 3.05 | 5.17 | 0.08 | 7/5/06 | 18,515,306 | 5.9 | 7.0 |
| Custom Benchmark | 2.12 | -8.17 | -17.74 | -17.19 | 1.23 | 3.02 | 5.11 | | | | | |
| BlackRock LifePath Index 2030 Fund O | 3.08 | -8.37 | -18.63 | -17.97 | 2.08 | 3.68 | 5.88 | 0.08 | 8/1/05 | 27,237,173 | 8.6 | 8.5 |
| Custom Benchmark | 3.00 | -8.27 | -18.62 | -17.93 | 2.05 | 3.64 | 5.80 | | | | | |
| BlackRock LifePath Index 2035 Fund O | 3.93 | -8.41 | -19.43 | -18.64 | 2.89 | 4.29 | 6.55 | 0.08 | 7/5/06 | 21,519,479 | 6.8 | 9.1 |
| Custom Benchmark | 3.81 | -8.29 | -19.44 | -18.62 | 2.85 | 4.23 | 6.45 | | | | | |
| BlackRock LifePath Index 2040 Fund O | 4.76 | -8.43 | -20.21 | -19.28 | 3.58 | 4.80 | 7.12 | 0.08 | 8/1/05 | 23,993,941 | 7.6 | 9.7 |
| Custom Benchmark | 4.60 | -8.29 | -20.23 | -19.29 | 3.52 | 4.73 | 7.02 | | | | | |
| BlackRock LifePath Index 2045 Fund O | 5.51 | -8.36 | -20.81 | -19.80 | 4.18 | 5.21 | 7.59 | 0.08 | 7/5/06 | 20,469,831 | 6.5 | 10.1 |
| Custom Benchmark | 5.33 | -8.21 | -20.85 | -19.83 | 4.10 | 5.12 | 7.46 | | | | | |
| BlackRock LifePath Index 2050 Fund O | 5.97 | -8.17 | -21.10 | -20.04 | 4.50 | 5.42 | 7.86 | 0.08 | 9/30/07 | 12,234,894 | 3.9 | 8.1 |
| Custom Benchmark | 5.79 | -8.00 | -21.13 | -20.07 | 4.43 | 5.33 | 7.74 | | | | | |
| BlackRock LifePath Index 2055 Fund O | 6.11 | -8.08 | -21.13 | -20.07 | 4.58 | 5.46 | 8.01 | 0.08 | 5/19/10 | 5,891,639 | 1.9 | 6.3 |
| Custom Benchmark | 5.94 | -7.89 | -21.17 | -20.10 | 4.51 | 5.38 | 7.89 | | | | | |
| BlackRock LifePath Index 2060 Fund O | 6.11 | -8.08 | -21.14 | -20.08 | 4.56 | 5.45 | 6.25 | 0.08 | 11/17/14 | 1,323,937 | 0.4 | 2.9 |
| Custom Benchmark | 5.94 | -7.89 | -21.18 | -20.11 | 4.50 | 5.37 | 6.12 | | | | | |
| BlackRock LifePath Index 2065 Fund O | 6.07 | -8.10 | -21.18 | -20.11 | 4.46 | n/a | 5.00 | 0.08 | 9/23/19 | 1,997,693 | 0.6 | 1.6 |
| Custom Benchmark | 5.93 | -7.90 | -21.20 | -20.13 | 4.49 | n/a | 5.03 | | | | | |
| Individual Options | | | | | | | | | | | | |
| BlackRock Short-Term Investment Fund W ⁵ | 0.28 | 0.72 | 1.18 | 1.21 | 0.77 | 1.35 | 0.89 | 0.08 | 7/1/03 | 5,990,749 | 1.9 | 7.5 |
| FTSE 3 Month Treasury Bill Index | 0.25 | 0.59 | 0.87 | 0.88 | 0.60 | 1.16 | 0.68 | | | | | |
| Yield as of 10/31/22: 3.30% ⁶ | | | | | | | | | | | | |
| BlackRock U.S. Debt Index Fund M ⁷ | -1.29 | -8.21 | -15.59 | -15.62 | -3.71 | -0.50 | 0.81 | 0.03 | 6/6/96 | 8,739,104 | 2.8 | 18.1 |
| Bloomberg U.S. Aggregate Bond Index | -1.30 | -8.23 | -15.72 | -15.68 | -3.77 | -0.54 | 0.74 | | | | | |
| BlackRock U.S. TIPS Fund M ⁸ | 1.26 | -7.96 | -12.48 | -11.46 | 1.20 | 2.24 | 1.10 | 0.03 | 7/30/02 | 4,779,720 | 1.5 | 12.4 |
| Bloomberg U.S. TIPS Index | 1.24 | -7.97 | -12.54 | -11.47 | 1.12 | 2.16 | 1.02 | | | | | |
| BlackRock Equity Index Fund J ⁹ | 8.09 | -5.87 | -17.70 | -14.61 | 10.24 | 10.48 | 12.82 | 0.01 | 3/5/97 | 35,080,039 | 11.1 | 24.4 |
| S&P 500 Index | 8.10 | -5.86 | -17.70 | -14.61 | 10.22 | 10.44 | 12.79 | | | | | |
| BlackRock Russell 2500 Index Fund M ¹⁰ | 9.60 | -3.46 | -16.69 | -17.52 | 7.97 | 7.10 | 10.78 | 0.03 | 9/30/08 | 7,878,176 | 2.5 | 4.7 |
| Russell 2500 Index | 9.59 | -3.48 | -16.72 | -17.58 | 7.94 | 7.07 | 10.70 | | | | | |
| BlackRock MSCI ACWI ex-U.S. IMI Index Fund M ¹¹ | 3.55 | -10.76 | -24.59 | -25.06 | -1.29 | -0.38 | 3.64 | 0.11 | 2/28/11 | 13,350,402 | 4.2 | 17.9 |
| MSCI ACWI ex-U.S. IMI Index | 3.03 | -10.32 | -24.71 | -25.17 | -1.44 | -0.56 | 3.46 | | | | | |
| BlackRock MSCI ACWI IMI Index Non-Lendable Fund M ¹² | 6.39 | -7.56 | -20.88 | -19.97 | 5.00 | 5.29 | 7.42 | 0.05 | 4/12/13 | 40,175,330 | 12.8 | 31.7 |
| MSCI ACWI IMI Index | 6.15 | -7.50 | -21.15 | -20.22 | 4.77 | 4.99 | 7.07 | | | | | |
| TIAA Real Estate Account ¹³ | -0.22 | 0.40 | 11.86 | 16.36 | 9.60 | 7.84 | 7.92 | 0.77 | 10/2/95 | 12,363,329 | 3.9 | 26.8 |
| Custom Composite Benchmark ¹⁴ | n/a | n/a | n/a | n/a | n/a | n/a | n/a | | | | | |
| TIAA Traditional Annuity RC ^{15,16,17,18} | 0.36 | 1.07 | 3.43 | 4.02 | 3.88 | 3.96 | 4.14 | --- | 8/1/05 | 27,017,126 | 8.6 | 28.3 |
| Self-Directed Brokerage Account | | | | | | | | | | | | |
| TIAA - Self-Directed Account | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | 4,367,070 | 1.4 | 0.9 |
| Total | | | | | | | | | | \$315,093,966 | | |

Footnotes >

- 1 If the fund was not in existence for 10 years, fund and corresponding benchmark returns shown represent performance from the since inception date.
- 2 Fund investment advisers may voluntarily agree to waive expenses. Expense waivers may be terminated at any time.
- 3 The BlackRock LifePath Index Funds O invest in the master LifePath Index Funds F. The inception dates shown reflect the inception date of the master LifePath Funds F. The inception dates for most LifePath Funds O were 12/9/11. The 2055 Fund's O inception date was 12/12/11, the 2060 Fund's O inception date was 1/2/15 and the 2065 Fund's O inception date was 9/23/19. Returns prior to Funds' O inception dates are those of Funds F with deductions taken for Funds O investment management fees.
- 4 Benchmarks are calculated using blended returns of third-party indices that proportionately reflect the respective weightings of the Portfolios' asset classes. Weightings are adjusted quarterly to reflect the Portfolios' asset allocation shifts over time. Indices currently used to calculate the custom benchmarks are: Russell 1000 Index, Russell 2000 Index, MSCI ACWI Ex-U.S. IMI Net Dividend Return Index, Bloomberg U.S. Long Credit Bond Index, Bloomberg U.S. Intermediate Credit Bond Index, Bloomberg U.S. Long Government Bond Index, Bloomberg U.S. Intermediate Government Bond Index, Bloomberg U.S. Securitized: MBS, ABS, and CMBS Index, Bloomberg U.S. TIPS Index, FTSE EPRA/NAREIT Developed Index and the Bloomberg Commodity Index Total Return.
- 5 An investment in a money market fund is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. Although the Fund seeks to preserve the value of your investment it is possible to lose money by investing in the Fund.
- 6 The current yield more closely reflects the earnings of the Fund than the total net return information.
- 7 The BlackRock U.S. Debt Fund M invests in the master Fund F. The inception date shown reflects the inception of the master Fund F. The inception date of Fund M was 7/20/12. Returns prior to Fund M's inception date are those of Fund F with deductions taken for Fund M's investment management fees.
- 8 The BlackRock U.S. Treasury Inflation-Protected Securities Fund M invests in the master Fund F. The inception date shown reflects the inception of the master Fund F. The inception date of Fund M was 7/20/12. Returns prior to Fund M's inception date are those of Fund F with deductions taken for Fund M' investment management fees.
- 9 The BlackRock Equity Index Fund J invests in the master Fund F. The inception date shown reflects the inception of the master Fund F. The inception date of Fund J was 3/20/17. Returns prior to Fund J's inception date are those of Fund F with deductions taken for Fund J's investment management fees.
- 10 The BlackRock Russell 2500 Fund M invests in the master Fund F. The inception date shown reflects the inception of the master Fund F. The inception date of Fund M was 1/30/13. Returns prior to Fund M's inception date are those of Fund F with deductions taken for Fund M's investment management fees.
- 11 The BlackRock MSCI ACWI ex-U.S. IMI Index Fund M invests in the master Fund F. The inception date shown reflects the inception of the master Fund F. The inception date of Fund M was 12/31/12. Returns prior to Fund M's inception date are those of Fund F with deductions taken for Fund M's investment management fees.
- 12 The BlackRock MSCI ACWI IMI Index Fund M invests in the master Fund F. Inception dates for the master Fund F and Fund M are both 4/12/13.
- 13 Transfers out of the TIAA Real Estate Account (REA) are limited to one per quarter. Currently, these transfers do not require a minimum transaction amount; however, in the future TIAA reserves the right, in its sole discretion, to impose minimum transaction levels, which levels will generally be at least \$1,000 (except for systematic transfers, which must be at least \$100) or your entire accumulation, if less. Participants may not make a lump-sum transfer into the REA if their aggregated balances across all contracts is greater than \$150,000. Systematic transfers and recurring contributions are not subject to this limitation.
- 14 Effective January 2014, the Custom Composite Index is 70% NCREIF Open End Diversified Core Equity (ODCE) Net Index, 20% Bloomberg 3-Month Treasury Bill Index, and 10% Dow Jones U.S. Select REIT Index. Prior periods include other representative indices. TIAA's investment management team does not manage its real estate portfolio to a specific published index benchmark. The Custom Composite Index represents a reasonable proxy of how TIAA allocates assets among real property, short-term investments, and REITs over time. The Virginia Retirement System anticipates that Fund returns may vary greatly from those of the Custom Composite Index. Benchmark returns are not available for months that do not end on a calendar quarter due to the fact that NCREIF ODCE Index returns are only published each calendar quarter.
- 15 Upon separation from service or retirement participants can convert their TIAA Traditional accumulation dollars amount to a lifetime income option or withdraw funds through a fixed period annuity ranging from five to 30 years or a Transfer Payout Annuity, which enables participants to move funds out of the TIAA Traditional Annuity in 7 annual installments for the Retirement Choice (RC) contract. Each installment includes a portion of principal and interest, based on the rate in effect when transfer or withdrawal funds are made. However, there are two exceptions to the payout installment. First, if the TIAA Traditional account balance is less than \$5,000, participants can transfer the total amount at any time following termination of employment, but only once during the life of the contract. Second, TIAA Traditional can be withdrawn or transferred to another company up to the full balance within 120 days following termination of employment, subject to 2.5% surrender charge. After the 120-day period, participants can withdraw funds only through a fixed period annuity ranging from five to 30 years or the Transfer Payout Annuity.
- 16 The TIAA Traditional Annuity RC contract has minimum guaranteed rate during the accumulation phase of 1% to 3% . The current minimum rate for the RC contract is 1%. Further, the TIAA Traditional Annuity RC contract applies to premiums deposited during the applicable calendar year and is guaranteed for 10 years, at which point the minimum rate for these premiums will be reset.
- 17 TIAA's annual credited rate on new money for the RC contract for the month of October was 6.00%.
- 18 The TIAA Traditional Annuity is not an investment for purposes of federal securities laws; it is a guaranteed insurance contract. Therefore, unlike a variable annuity or mutual fund, the TIAA Traditional Annuity does not include an identifiable expense ratio. Each premium allocated to the TIAA Traditional Annuity buys a definite amount of lifetime income for participants based on the rate schedule in effect at the time the premium is paid. In addition, the TIAA Traditional Annuity provides a guarantee of principle, a guaranteed minimum rate of interest and the potential for additional amounts of interest when declared by TIAA's Board of Trustees. Additional amounts, when declared, remain in effect for the "declaration year" that begins each March for the accumulating annuities and January for lifetime payout annuities. Additional amounts are not guaranteed for future years.
- 19 May not equal 100% due to rounding
- 20 The data reflects the percentage of participants who selected a particular investment option as of September 30, 2022. There were 5,297 (RC contract) participants as of September 30, 2022.
- 21 Effective July 2022, TIAA no longer provides an estimated expense ratio for its TIAA Traditional Annuity product.

Performance returns shown reflect all fund management fees and other investment related expenses, but do not reflect the TIAA annual administrative fee of \$28 (deducted at \$7.00 per quarter) which would further reduce the returns shown. Performance returns do not reflect redemption fees and/or surrender charges, if applicable.

All calculations assume reinvestment of dividends and capital gains. All returns are calculated in U.S dollars. Fund and benchmark returns are provided by TIAA and BlackRock. Although data is gathered from sources to be reliable, the Virginia Retirement System cannot guarantee completeness or accuracy.

CEM 2021 DC Survey Highlights



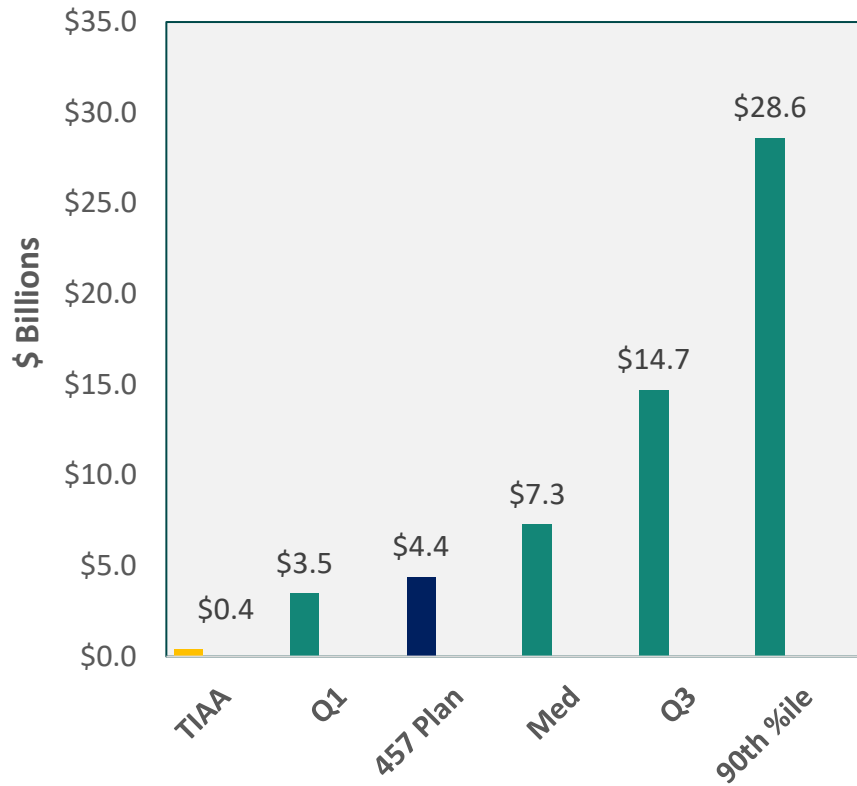
- CEM has benchmarked performance of DC plans since 1997
- 2021 survey comprised of 99 corporate plans and 24 public plans representing \$1.4 trillion in assets
- VRS participated in CEM's free DC cost and performance report survey and received a complimentary trial of CEM's Dashboard
 - 457 Deferred Compensation Plan: supplemental (unbundled)
 - TIAA ORPHE*: primary (bundled)
- CEM's free DC survey reports are included in the Appendix
 - CEM figures may not foot due to rounding

*Information based solely on TIAA's RC contract investment options

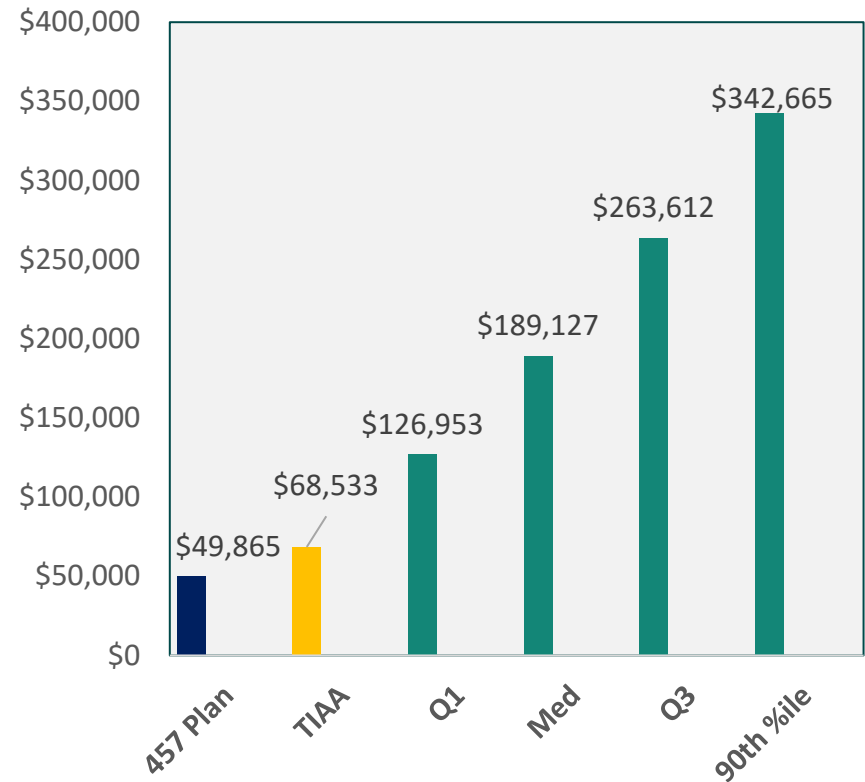
- Differences in plan size and participant account balances due to many factors including:
 - Whether a plan is a primary or a supplemental plan, contribution & matching rates, participant demographics, and plan design
- Comparing a plan's total plan costs to other plans provides limited insight because of differences in economies of scale and types of investments offered

CEM 2021 DC Survey Highlights

Plan Size

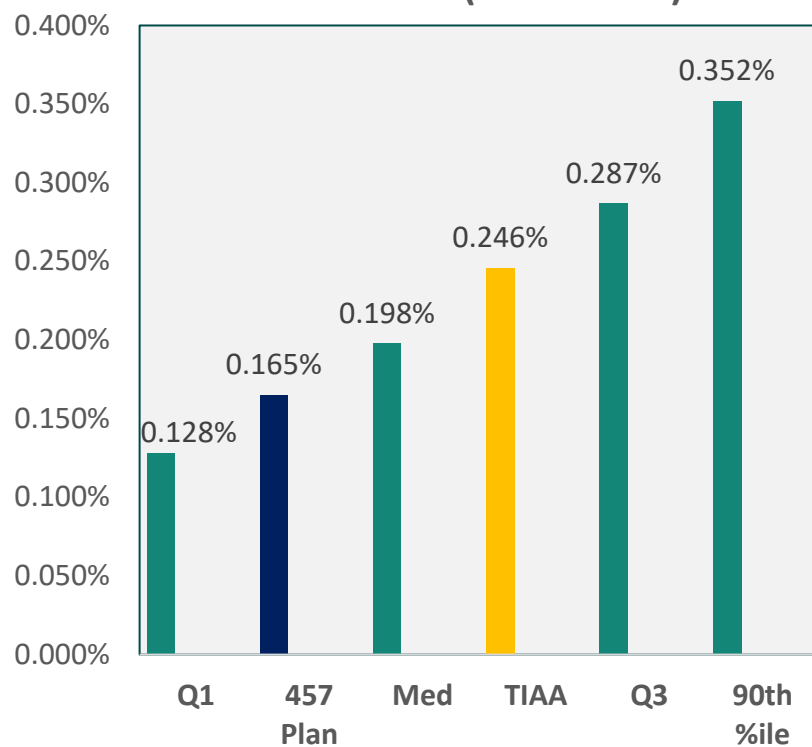


Average Account Balance

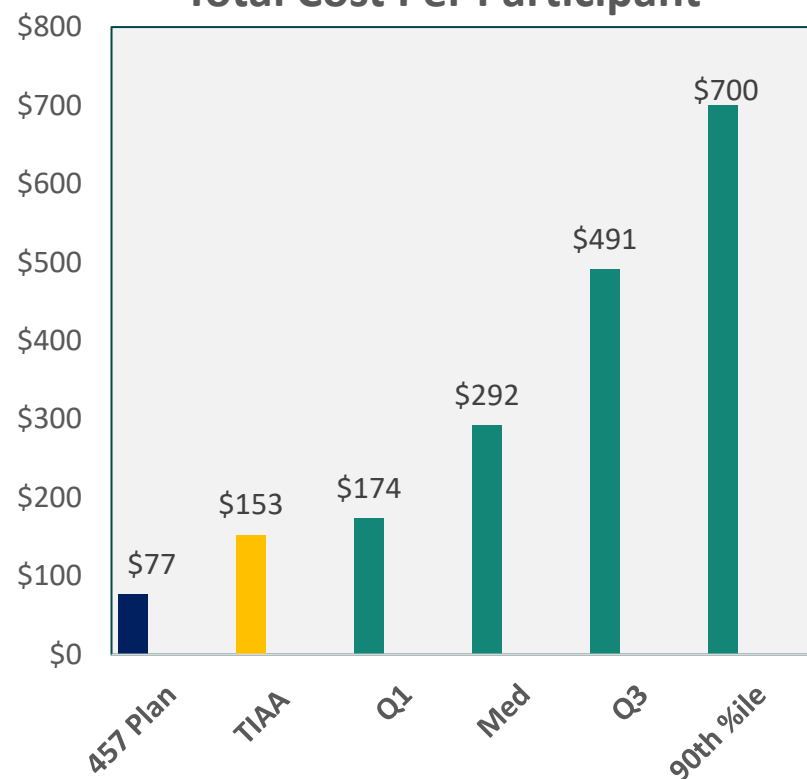


CEM 2021 DC Survey Highlights

Total Plan Cost (% of assets)



Total Cost Per Participant



CEM 2021 DC Survey Highlights



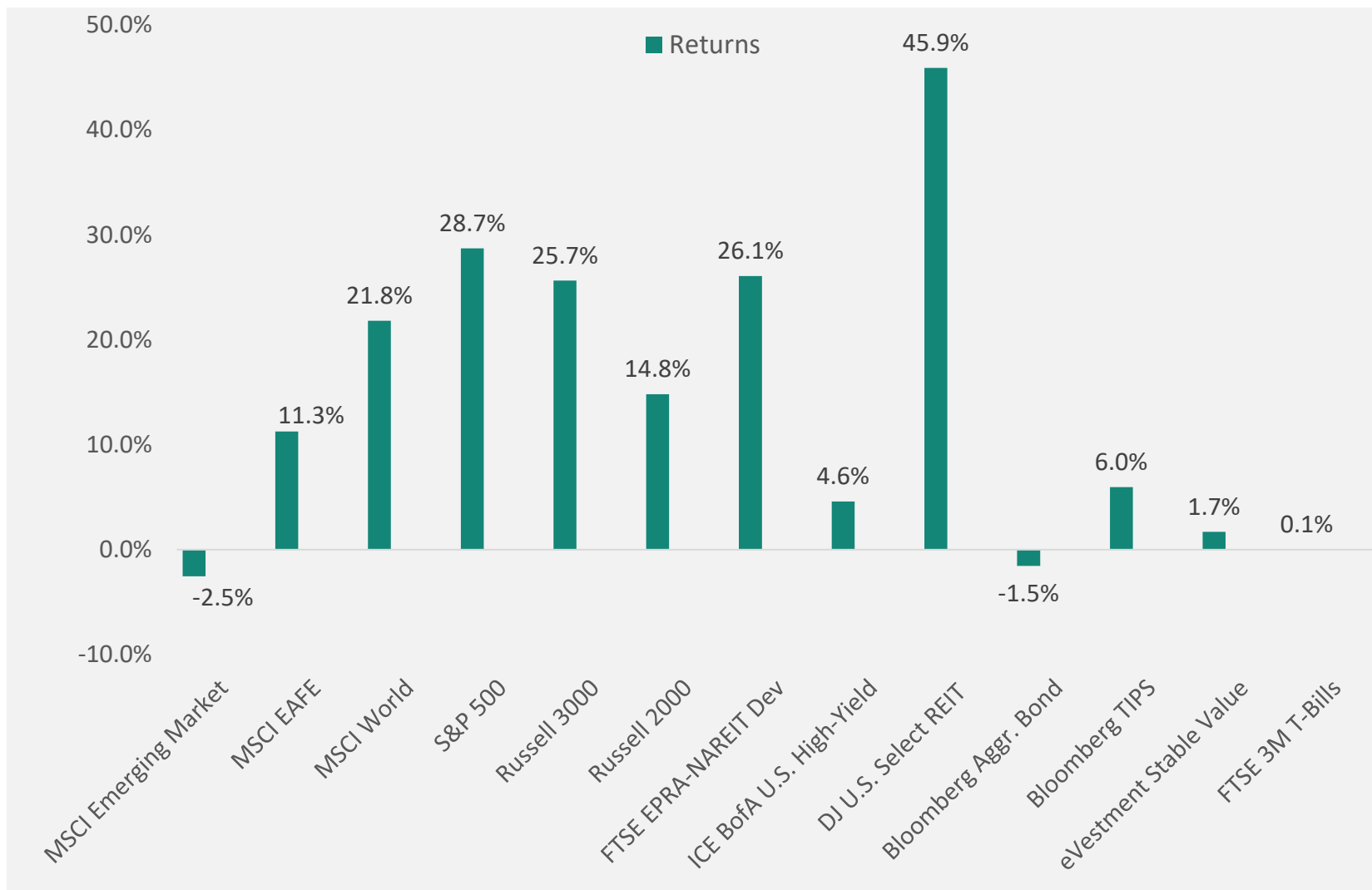
| Costs | 457 Plan | TIAA ORPHE |
|---|---------------------|-----------------------|
| Investment | 7.6 bps or \$3.1 M | 9.5 bps or \$311,000 |
| Record-Keeping & Administration | 7.2 bps or \$2.9 M | 11.1 bps or \$363,000 |
| Internal Oversight | 1.7 bps or \$0.7 M | 5.5 bps or \$180,000 |
| Less Record-Keeping Rebates to Participants | n/a | -1.6 bps or -\$53,000 |
| Total Record-Keeping; Administration; Oversight After Rebates | 8.9 bps or \$3.6 M | 15.0 bps or \$490,000 |
| Total Plan Costs (Investments & Administration) | 16.5 bps or \$6.7 M | 24.6 bps or \$800,000 |
| Cost Per Participant | \$77 | \$153 |

Figures may not foot due to rounding

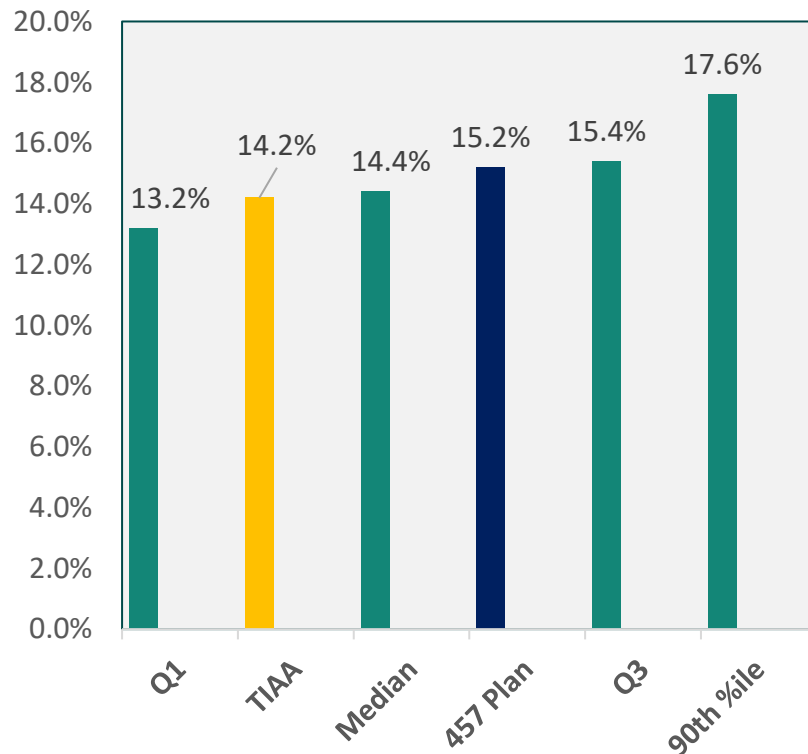
- CEM universe median investment options offered: 14
 - VRS 457 Plan: 12
 - TIAA ORPHE: 11

(Self-Directed Brokerage Accounts and target date series counted as one option)
- A plan's asset mix is a function of investments offered and participants' investment option choices
- A plan's asset mix is often the biggest reason for differences in total returns of plan participants

Asset Class Returns 1-Year Ending December 31, 2021



Average Total Return of Plan Participants



Average total return measures the change in the average participant's account balance as a result of net investment returns earned by their investments weighted by their holdings

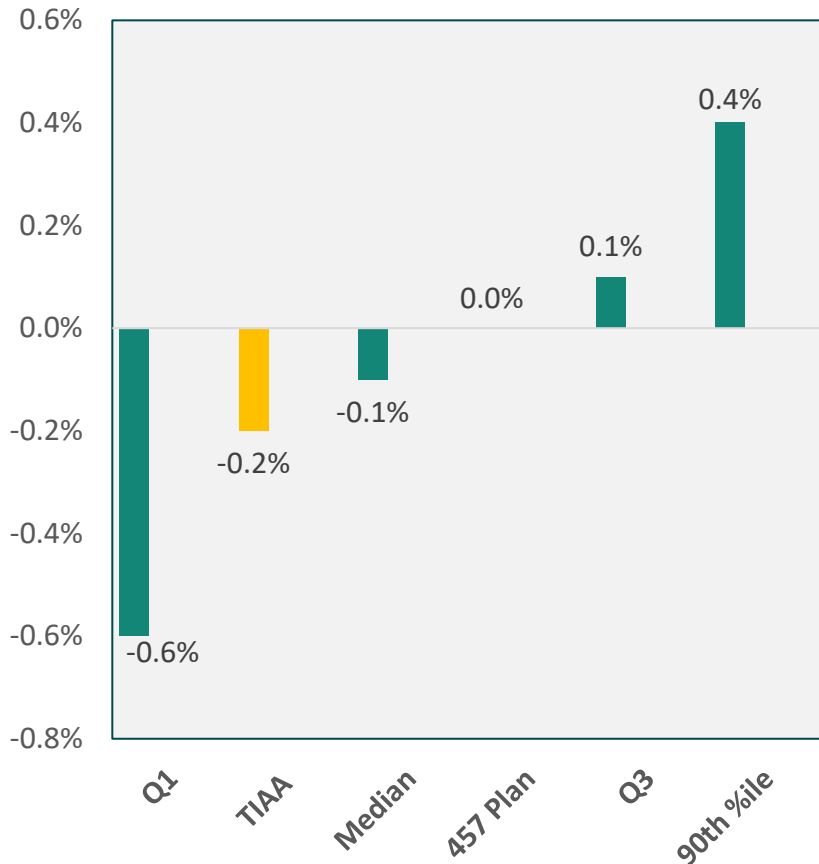
Primary causes of differences in plan participants' average net total return:

- Participants' selected asset mixes
- Value added performance (amount investment options outperformed their benchmark indices)

- CEM's research has shown consistently there is no relationship between what plans spend and what they received
 - The more you pay (cost) does not necessarily translate into the more you get (value added)
- Low value added = on average, a plan's investment options are underperforming their benchmark indices (net of costs)
 - Note that where indexed investment options are offered, net value added is not expected to be significant since the goal of an indexed option is to track the return of the underlying index
- High value added = on average, a plan's investment options are outperforming their benchmark indices (net of costs)

CEM 2021 DC Survey Highlights

Average Total Plan Value Added



Average total plan value added = weighted net investment returns minus administration costs (after rebates) minus weighted benchmark returns

A positive figure indicates, on average, investments are outperforming benchmarks and a negative figure indicates underperformance

Net value added for funds that are indexed investment options (track benchmarks) typically are low value added (benchmark returns – fund expense ratios)

CEM DC Survey Highlights



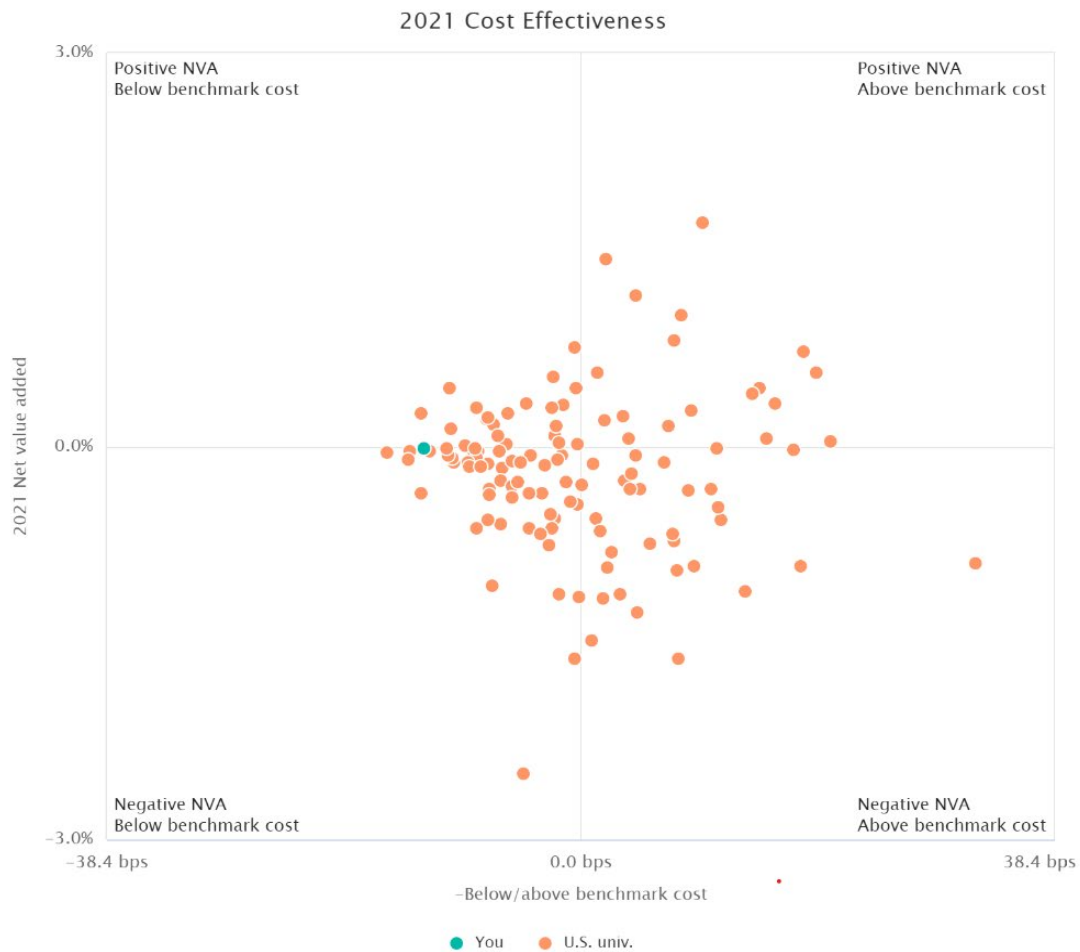
| 457 Plan | 2021 | 2020 | 2019 |
|---|---------------|---------------|----------------------------|
| Plan Assets | \$4.4 billion | \$3.8 billion | \$3.1 billion |
| Investment Costs | 7.6 bps | 8 bps | 9 bps |
| Administrative Costs | 8.9 bps | 9.3 bps | 11 bps |
| Total Plan Costs | 16.5 bps | 17.3 bps | 20 bps |
| CEM's 457 Plan Benchmark Cost | Not Available | Not Available | 35 bps |
| 457 Plan's Excess Cost | Not Available | Not Available | - 15 bps |
| Cost Per Participant | \$77 | \$69 | \$69 |
| Average Total Return of Plan Participants | 15.2% | 12.4% | 20.3% |
| Average Total Plan Value Added | 0.0% | 0.2% | 0.0% |
| CEM Cost Effectiveness Ranking | Not Available | Not Available | High value added, low cost |

CEM DC Survey Highlights

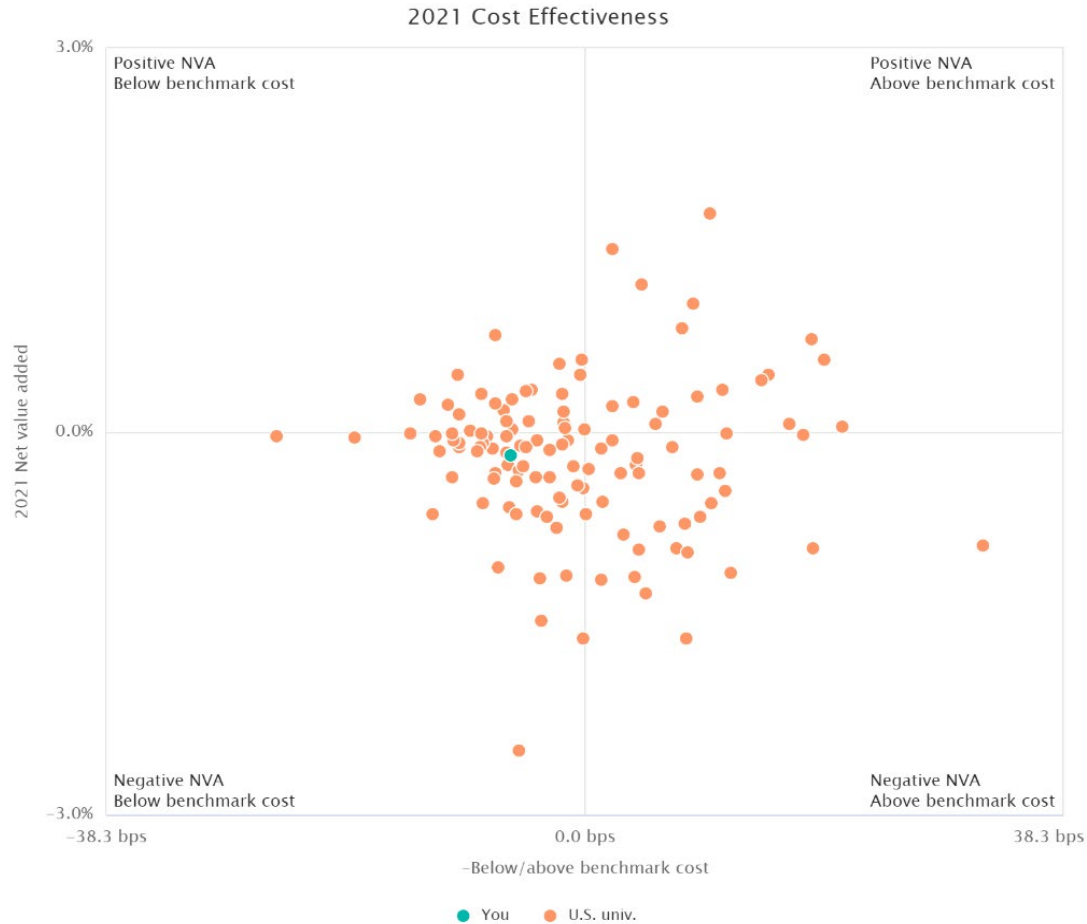


| TIAA ORPHE | 2021 | 2020 | 2019 |
|---|---------------|------------------------------|-------------------------------|
| Plan Assets | \$357 million | \$294 million | \$811 million |
| Investment Costs | 9.5 bps | 9.9 bps | 21 bps |
| Administrative Costs (after any rebates) | 15.0 bps | 23.7 bps | 20 bps |
| Total Plan Costs | 24.6 bps | 33.7 bps | 41 bps |
| CEM's TIAA Benchmark Cost | Not Available | Not Available | 34 bps |
| TIAA Excess Cost | Not Available | Not Available | 7 bps |
| Cost Per Participant | \$153 | \$157 (revised from \$98) | \$391 |
| Average Total Return of Plan Participants | 14.2% | 12.2% | 16.7% |
| Average Total Plan Value Added | -0.2% | -0.1% | -0.1% |
| CEM Cost Effectiveness Ranking | Not Available | Not Available | Low value added, high cost |

CEM Dashboard – 457 Plan



CEM Dashboard – TIAA ORPHE





**Approve Additional Methods of Proxy Voting
for the Defined Contribution Plans**

Requested Action

The VRS Board of Trustees approves additional proxy voting methods used for the defined contribution (DC) plans and delegates to the Chief Investment Officer which method(s) to select. In addition to the current method whereby the Board has delegated full authority and responsibility to the investment managers to vote all securities held in the plans, the Board approves additional voting choice options, where feasible, to include voting proxies by selecting from a menu of third-party proxy voting policies offered by an investment manager or voting proxies according to VRS' own policies.

Description/Background

Currently, most investment options offered through the VRS-administered DC plans are via collective investment trusts (CITs). Like mutual funds, investors in CITs invest and own units or shares of a fund and do not own a fund's underlying securities directly. Standard practice regarding proxy voting for CITs and mutual funds is to have the investment manager vote proxies on behalf of the fund investors.

One of the VRS DC investment managers, BlackRock, approached VRS with an expanded proxy voting choice option for their institutional clients investing in certain index strategies in addition to the current method of BlackRock voting proxies on behalf of their clients.

Additionally, recent news reports indicated other investment managers are exploring ways for fund investors at the institutional and retail level to vote proxies.

Rationale for Requested Action

Proxy voting optionality provides VRS the opportunity to potentially have more influence on how publicly traded companies are managed and vote its pro-rata share of a fund's securities that are more in-line with VRS investment strategies and beliefs.

Authority for Requested Action

Section 51.1-124.22(8) of the *Code of Virginia* authorizes the VRS Board of Trustees to adopt procedures and make determinations necessary to carry out the provisions of Title 51.1.

The above action is approved.

A. Scott Andrews, Chairman
VRS Board of Trustees

Date



Appointment of DCPAC member.

Requested Action

The Board appoints C. Matt Harris to the Defined Contribution Plans Advisory Committee (DCPAC) to fill the unexpired term of Edward N. (Ned) Smither, which expires June 20, 2024.

Rationale for Requested Action

Mr. Harris was appointed Deputy County Administrator for Finance and Administration at Chesterfield County in March 2018. He supervises and coordinates the operations of the County Administrator's Office and the Clerk to the Board of Supervisor's Office to ensure integrated support and interaction with the County Administrator, Board of Supervisors, employees and residents of the County. He also coordinates special events and serves as Liaison with the Committee on the Future, Registrar, Commissioner of the Revenue and Treasurer. Mr. Harris oversees the following County departments: Accounting; Budget and Management; Clerk to the Board of Supervisor's Office; Committee on the Future; Communications and Media; County Administrator's Office; Finance; Intergovernmental Relations; Learning and Performance Center; Procurement; Real Estate Assessment; and Special Events.

Prior to being appointed Deputy, Mr. Harris served as the County's Budget and Management director where he led the department and served as a key advisor to the County Administrator and the Board of Supervisors.

Mr. Harris earned an undergraduate degree in Economics from Virginia Tech and a Master's degree from the University of North Carolina – Chapel Hill.

Mr. Harris is highly qualified and willing to be appointed to the DCPAC, and it is the Board's pleasure to appoint him to the Committee.

Authority for Requested Action

Code of Virginia § 51.1-124.26 authorizes the Board to appoint such other advisory committees as it deems necessary. Each member appointment requires a two-thirds vote of the Board, and advisory committee members serve at the pleasure of the Board.

The above action is approved.

A. Scott Andrews, Chair
VRS Board of Trustees

Date

Matt Harris, Deputy County Administrator for Finance and Administration

Matt Harris was appointed Deputy County Administrator for Finance and Administration in March 2018. He supervises and coordinates the operations of the County Administrator's Office and the Office of Constituent Services to help ensure integrated support and interaction with the County Administrator, Board of Supervisors, employees and residents of the County. Mr. Harris also provides strategic direction and supervision to major county functions such as Intergovernmental Relations (the liaison function with state and Federal officials), the Learning and Performance Center, Communications and Media and Finance (Accounting, Budget and Management, Purchasing, Real Estate Assessment). He coordinates special events and serves as liaison with the Registrar, Commissioner of the Revenue and Treasurer. Mr. Harris also serves on the Board of Directors for the Riverside Regional Jail, the finance committee for the Greater Richmond Convention Center Authority, the Board of Directors for the VML-VACo OPEB Trust, the Board of Directors for the Chesterfield County SRP Trust, the Board of Directors for the Chesterfield County Schools SRP Trust, and is a member of the VACo Finance Steering Committee.

Prior to being appointed Deputy, Mr. Harris served as the county's Budget and Management Director where he led the department and served as a key advisor to the County Administrator and the Board of Supervisors.

Mr. Harris received a Bachelor's degree in Economics from Virginia Tech and a Master's degree from the University of North Carolina – Chapel Hill. He lives in Midlothian with his wife, Meghan, and five children.

Quarterly Review

VRS Defined Contribution Plans

July 1, 2022 – September 30, 2022

DCP
Virginia Retirement System

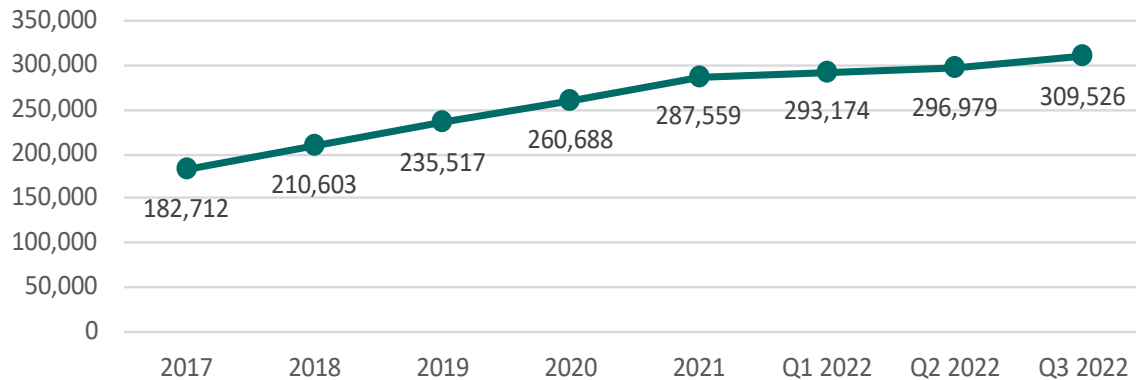


VRS Defined Contribution Plans¹

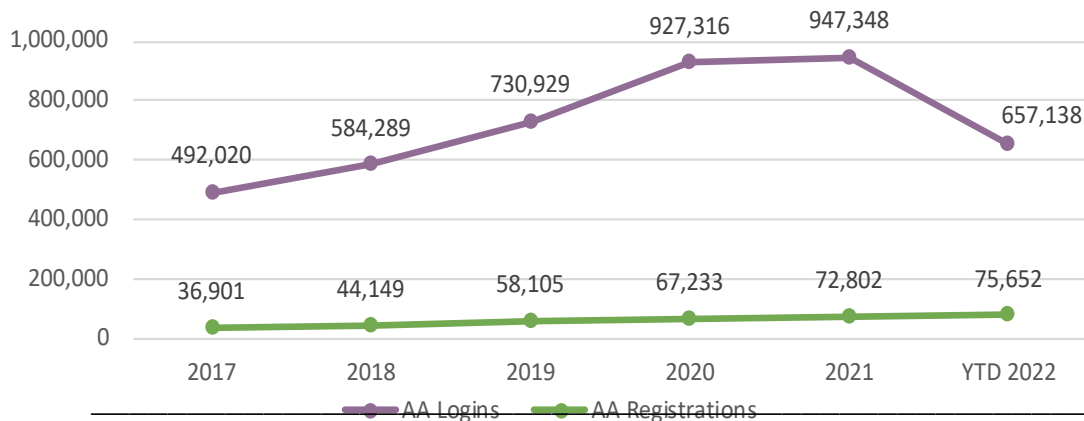
3rd Quarter 2022 – DC Plans Metrics

Total Assets²: \$5,538,745,801.42 Total Accounts²: 509,125

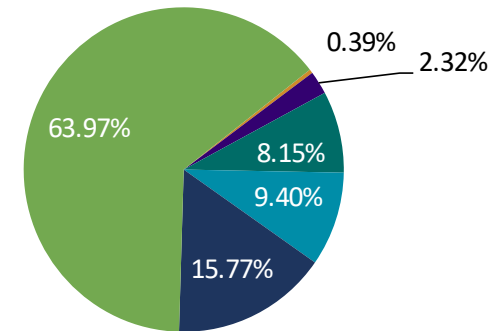
Unique Participants



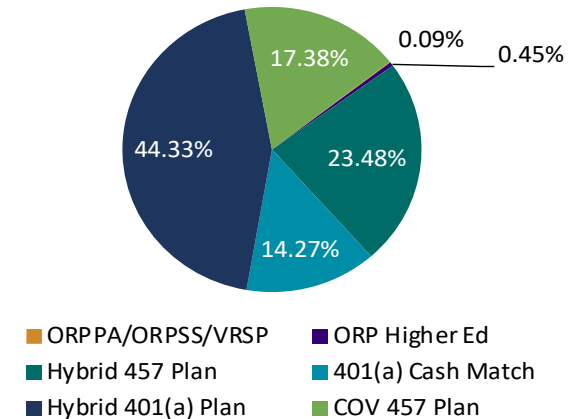
Account Access Registrations & Logins



Assets Under Management



Accounts Under Management



Top 10 Visited Pages³

1. Hybrid Retirement Plan Landing Page
2. COV 457 Retirement Plan Landing Page
3. Hybrid 457 Voluntary Contributions
4. Hybrid Plan Group Life Insurance
5. Hybrid Plan Education
6. COV 457 Overview
7. Hybrid Plan Info
8. Virginia Cash Match Landing Page
9. COV 457 Plan Info
10. Hybrid Maximizing Your Contributions

VRS Defined Contribution Plans

3rd Quarter 2022 – DC Plans Participant Engagement

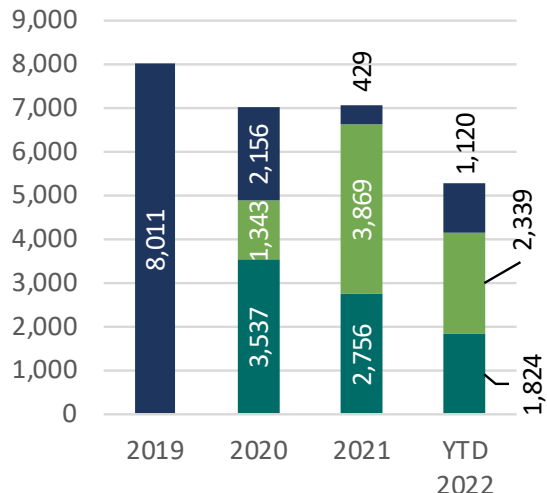
Call Center – Participant Services

- 41,007 calls received YTD in 2022
- 55,311 calls received in 2021
- 63,953 calls received in 2020
- 56,612 calls received in 2019

Current call trends:

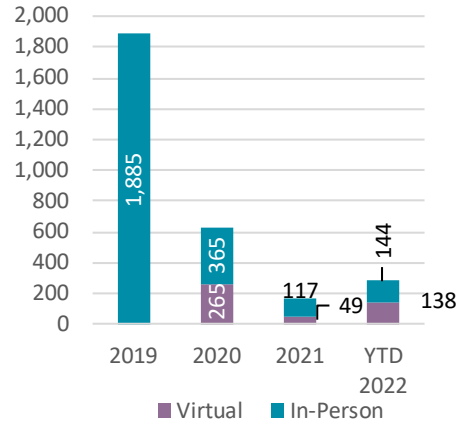
1. Withdrawals
2. General inquiries
3. Deferrals
4. Internet assistance
5. Indicative data

Individual Account Reviews

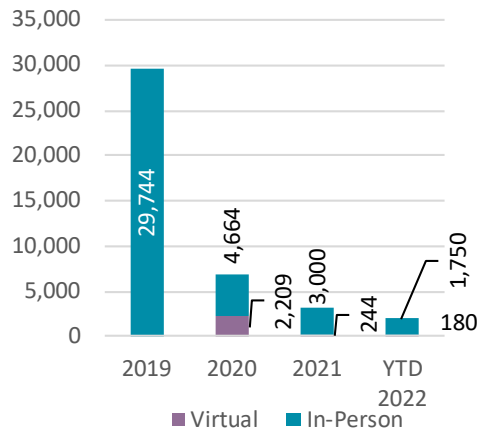


Participant Sessions

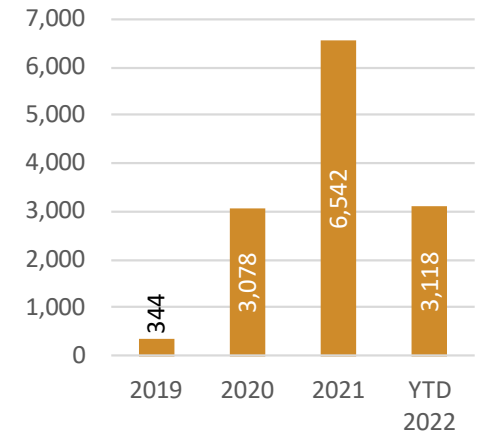
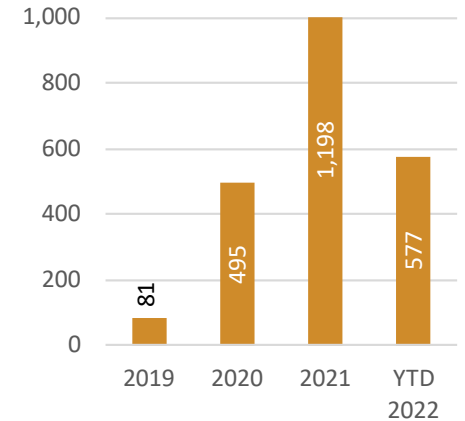
Group Meetings



Participant Attendance



Webinars



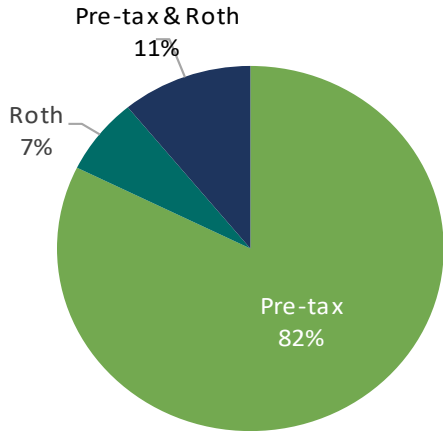
VRS Defined Contribution Plans

3rd Quarter 2022 – COV 457 Plan, Virginia Cash Match Plan

COV 457 Participation Rates

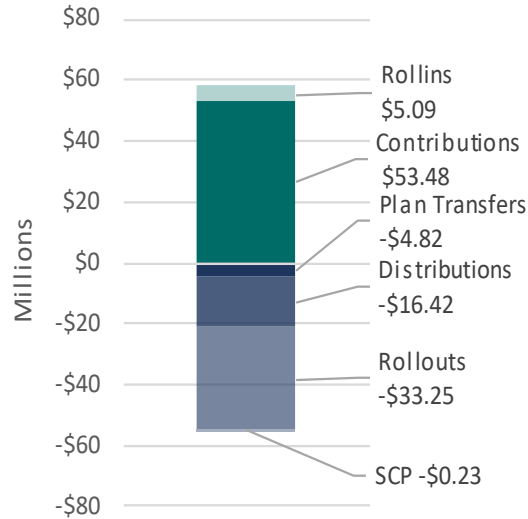
- State⁴ 35.06%
- Non-state 9.19%

Deferral Type



Average pre-tax deferral per pay = \$172.97
Average Roth deferral per pay = \$174.78

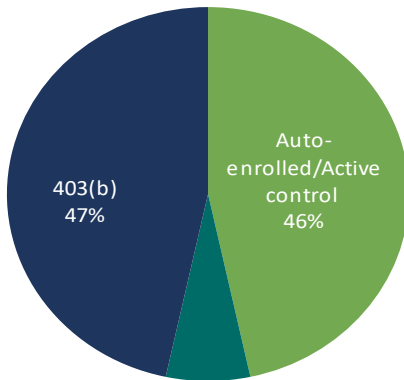
Contributions/Distributions⁵



Top 10 Fund Holdings

1. Stock \$1,218,722,077
2. Target Date Portfolios \$1,150,251,417
3. Stable Value \$644,746,800
4. Small/Mid-Cap Stock \$334,296,942
5. International Stock \$151,703,378
6. Bond \$138,195,593
7. Money Market \$92,793,950
8. Global Real Estate \$78,558,634
9. TD Ameritrade \$75,242,995
10. VRS Investment Portfolio \$54,310,567

Auto Enrollment



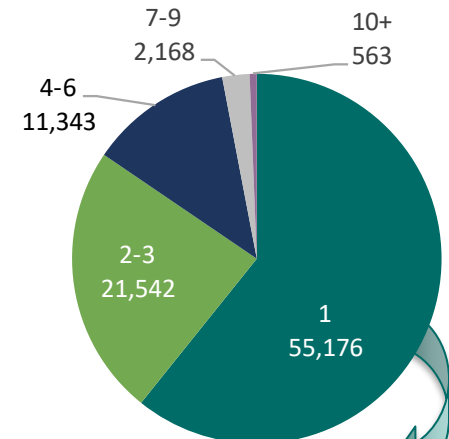
Participant Status Overview⁶

160,455 total accounts

56% Active
44% Separated

\$1,812m assets at-risk

of Funds Held by Participants

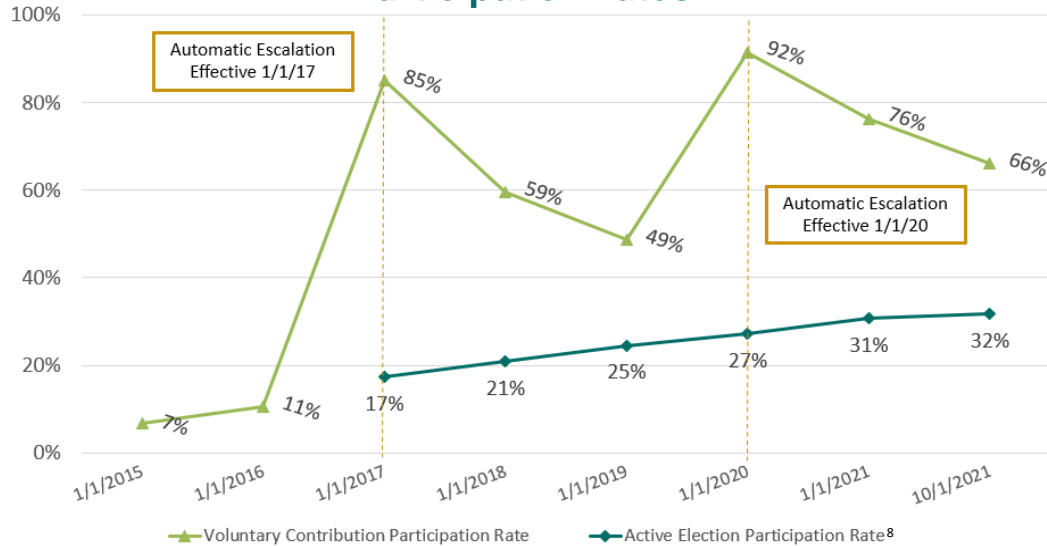


81% of this population is invested in a single TDP

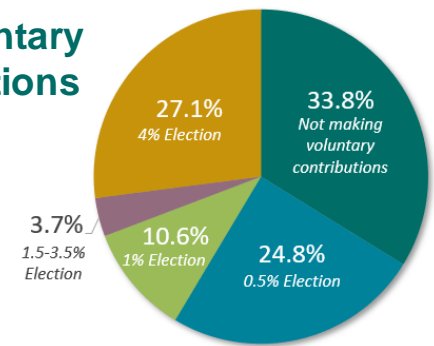
VRS Defined Contribution Plans

3rd Quarter 2022 – Hybrid Retirement Plan – 401(a) & 457(b)

Participation Rates⁷



Voluntary Elections



Top 10 Fund Holdings

| | |
|---------------------------|-----------------|
| 1. Target Date Portfolios | \$1,228,934,937 |
| 2. Stock | \$46,922,686 |
| 3. Small/Mid-Cap Stock | \$14,612,961 |
| 4. Money Market | \$9,851,617 |
| 5. Stable Value | \$8,822,040 |
| 6. International Stock | \$6,705,257 |
| 7. Global Real Estate | \$3,382,335 |
| 8. High-Yield Bond | \$3,123,097 |
| 9. Bond | \$2,752,304 |
| 10. TD Ameritrade | \$2,701,118 |

Participant Status Overview³

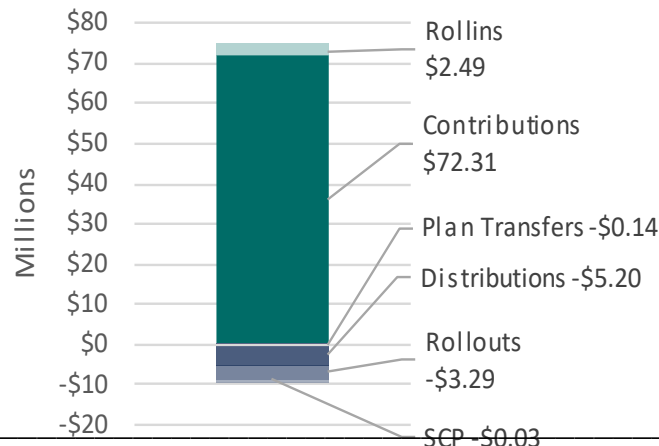
345,191 total accounts

71% Active

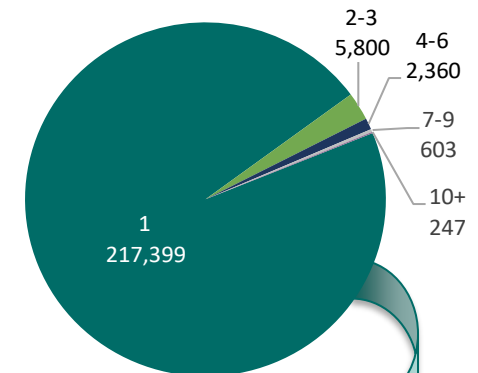
29% Separated

\$254m assets at-risk

Contributions/Distributions



of Funds Held by Participants



99.5% of this population is invested in a single TDP

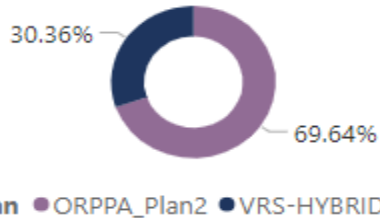
VRS Defined Contribution Plans

3rd Quarter 2022 – ORPHE* and ORPPA

ORPPA Participation

Participant Accounts: 469
 Assets: \$21,322,356
 Provider: MissionSquare

ORPPA-Eligible Plan Coverage

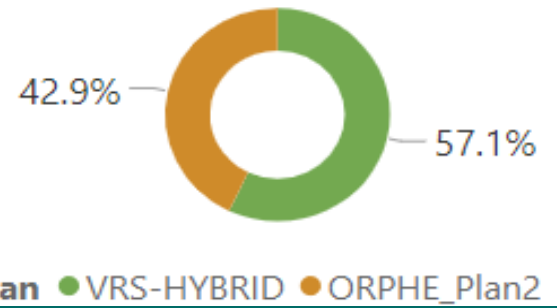


ORPHE Participation

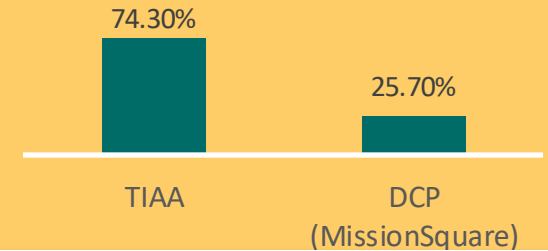
Participant Accounts: 10,597
 Assets: \$1,041,303,699
 Provider: MissionSquare, TIAA

Deselected Providers: Fidelity, T. Rowe Price, Empower, AIG-VALIC, MetLife, Participants: 1,395 Assets: \$123,154,511

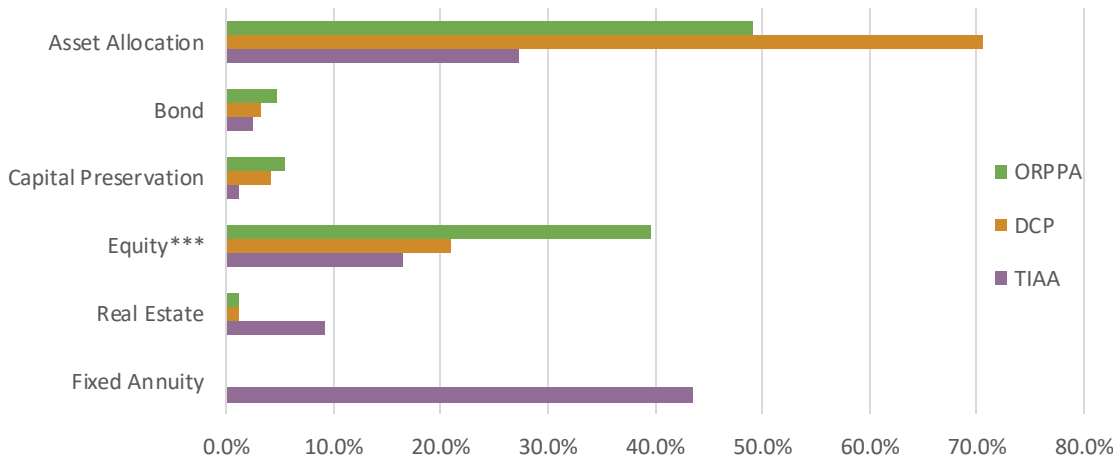
ORPHE-Eligible Plan Coverage



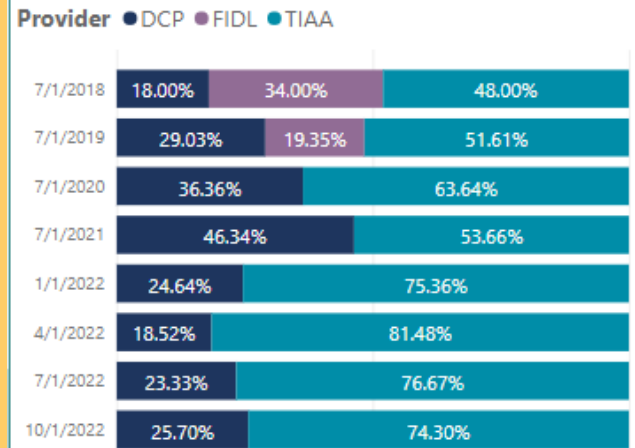
ORPHE Current Provider Election



Participant Holdings** by Plan and Asset Class



ORPHE Provider Election Rates Over Time



*Excludes opt-out higher ed institutions. **Excludes deselected investments. Some currently selected funds on the TIAA platform may include assets across the RC, RA, and GRA contracts. ***Includes both international and domestic equity.

VRS Defined Contribution Plans

3rd Quarter 2022 – DC Plans Metrics

Source Information/Additional Footnotes

All data unless noted otherwise was provided by MissionSquare Retirement and is as of 9/30/2022.

1. Includes DC plans record kept by MissionSquare Retirement.
2. Total assets and accounts include beneficiaries and excludes forfeiture and reserve accounts.
3. Web statistics provided by Google Analytics.
4. Includes employees at higher education institutions who are also eligible for a 403(b).
5. Cash Flow Definitions
 - Rollins – Contributions into a participant’s account from a retirement plan or IRA.
 - Contributions – Payroll contributions from a participant’s paycheck.
 - Plan Transfers – Transfer of funds between VRS retirement plans.
 - Distributions – Consists of auto enrollment refunds, required minimum distributions (RMDs) unforeseen emergency withdrawals and full, partial, installment and de minimis requests
 - Rollouts – Withdrawal request sent to another retirement plan or IRA
 - SCP – A request to transfer employee contribution funds from the plan to VRS to purchase service credit. Please note, SCP is not permitted from the H401 plan.
6. Active Participants do not have a termination date on file and may not have made a contribution during the quarter. Terminated Participants have a termination date on file.
7. Source: 10/1/21 Active Hybrid Member Demographics Report.
8. Active Election participation rate includes members who had a self-selected voluntary election on file prior to the automatic escalation that occurred on 12/16/19.

CEM Defined Contribution Survey Results

2021 Investment Benchmarking Analysis for Virginia Retirement System

Thank you for participating in CEM's annual Defined Contribution survey. Your results are only provided to you. Confidentiality of your data is strictly maintained.



CEM presents your 2021 benchmarking results!

We are pleased to present the 25th edition of the annual CEM Benchmarking results for defined contribution plans. In this complimentary PDF report, you will find a basic set of comparisons of your plan's 2021 investment option returns and costs to the U.S. universe.

In 2021 we introduced an improved benchmark cost calculation through the CEM Dashboard, our interactive online benchmarking service. The Dashboard includes your benchmark cost, calculated based on a custom selected group of similar-sized peers, adjusted for factors that impact fees. The CEM Dashboard contains our highest standard of fee and performance benchmarking analysis provided through a cost-effective, self-service channel. In addition, the Dashboard provides multi-year views and deeper insights into the cost and performance of your options, administrative and participant expenses, target date funds, and the line up. Please refer to page 13 for more details and access to a complimentary trial of this dashboard.

Feel free to contact us, if you have any questions, comments, or want to discuss your results. Our team is here to help you get the most out of benchmarking.

Thank you for your participation. We look forward to working with you again next year.

CEM Investment Benchmarking Team.

Copyright ©2022 by CEM Benchmarking Inc. (CEM). Although the information in this report has been based upon and obtained from sources we believe to be reliable, CEM does not guarantee its accuracy or completeness. The information contained herein is proprietary and confidential and may not be disclosed to third parties without the express written mutual consent of both CEM and Virginia Retirement System.

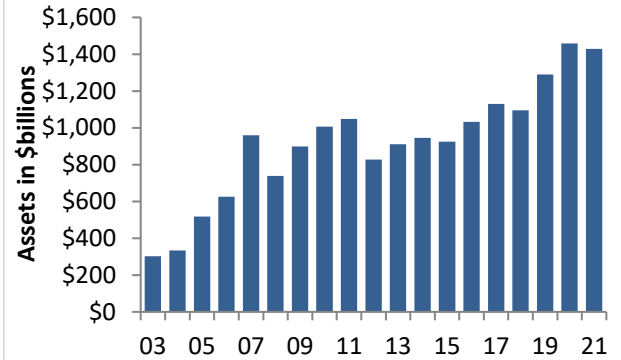
CEM U.S. defined contribution database

Database participation

CEM has been benchmarking the costs and performance of U.S. defined contribution plans, in a uniform basis, since 1997. In this free report, our thank you for participating in our database, your costs and performance are compared to the 2021 CEM universe, which consists of:

- 123 defined contribution plans aggregating \$1,428 billion.
- 99 corporate plans and 24 public plans.

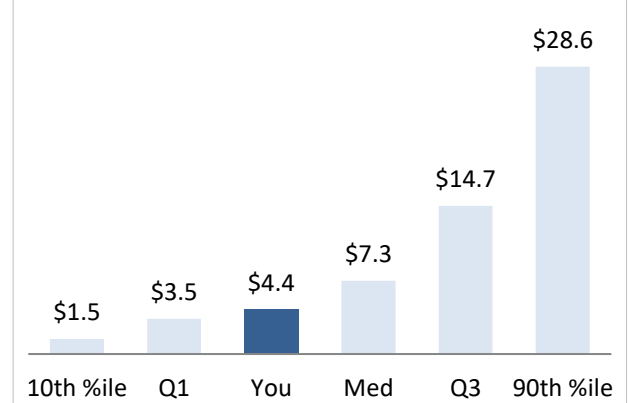
U.S. defined contribution universe: Total participating assets



Plan size

Your plan had \$4.4 billion in total assets (measured as the sum of option holdings) at the end of 2021. This was below the U.S. universe median of \$7.3 billion.

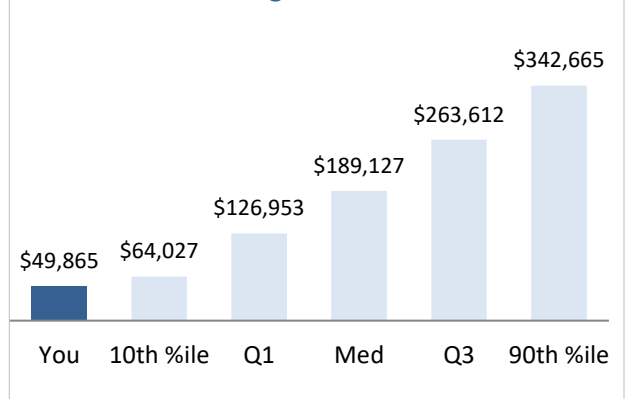
2021 Plan size, bln



Average account balance

The average account balance of your plan participants was \$49,865 in 2021. This compares to the U.S. universe median of \$189,127. Differences in average account balance reflect many factors including contribution rates, participant demographics and matching rates.

2021 Average account balance



Your 2021 total plan costs

Calculating your costs

Your plan's total cost in 2021, excluding individual participant expenses, was \$6.8 million which equals 16.5 bps on total assets or \$77 per participant.

1. Costs in dollars were estimated as 'basis point cost provided' x 'option average holdings', where [average holdings=(beginning of year + end of year)/2]. If beginning of year holdings were not available (you did not participate last year), then we estimated it as [beginning of year holdings=end of year holdings / (1 + return on holdings)].

2. Total expense ratio (7.6 bps) = average of option expense ratios weighted by option assets avg. Total \$ expense ratio (3,128) = plan total avg. assets (4,095) x expense ratio (7.6 bps). Plan total average assets (4,095) = (total assets eoy 2021 (4,383) + total assets eoy 2020 (3,807)) / 2.

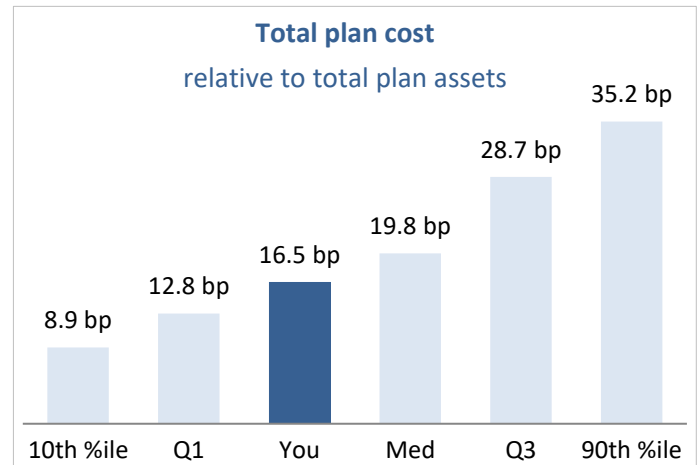
3. Defaults were applied if you were unable to provide cost for recordkeeping or internal oversight.

| Investment options | Expense ratio in bp | Assets Avg | Inv. Costs \$000s ¹ |
|--|---------------------|----------------|--------------------------------|
| BlackRock - Stock Fund | 1.0 bp | 1,302 | |
| BlackRock - Small/Mid-Cap Stock Fund | 2.0 bp | 377 | |
| BlackRock - International Stock Fund | 6.0 bp | 188 | |
| BlackRock - Bond Fund | 3.0 bp | 160 | |
| BlackRock - Inflation-Protected Bond Fund | 3.0 bp | 48 | |
| JPMorgan - High-Yield Bond Fund | 40.0 bp | 42 | |
| Galliard - Stable Value Fund | 24.0 bp | 531 | |
| BlackRock - Money Market Fund | 8.0 bp | 79 | |
| BlackRock - Retirement Portfolio | 8.0 bp | 315 | |
| BlackRock - Target Date 2025 Portfolio | 8.0 bp | 217 | |
| BlackRock - Target Date 2030 Portfolio | 8.0 bp | 177 | |
| BlackRock - Target Date 2035 Portfolio | 8.0 bp | 153 | |
| BlackRock - Target Date 2040 Portfolio | 8.0 bp | 110 | |
| BlackRock - Target Date 2045 Portfolio | 8.0 bp | 82 | |
| BlackRock - Target Date 2050 Portfolio | 8.0 bp | 56 | |
| BlackRock - Target Date 2055 Portfolio | 8.0 bp | 33 | |
| BlackRock - Target Date 2060 Portfolio | 8.0 bp | 9 | |
| BlackRock - Target Date 2065 Portfolio | 8.0 bp | 2 | |
| BlackRock - Global Real Estate Fund | 8.0 bp | 88 | |
| VRS - VRSIP | 60.0 bp | 42 | |
| Ameritrade - Self Directed Brokerage | n/a | n/a | |
| Total expense ratio, investment manager (A)² | 7.6 bp | \$4,095 | \$3,128 |
| Administrative expenses³ | | | |
| Recordkeeping and administration | 7.2 bp | | \$2,936 |
| Custodial and trustee | 0.0 bp | | \$0 |
| Internal oversight | 1.7 bp | | \$701 |
| Consulting | 0.0 bp | | \$0 |
| Other plan costs (legal, audit, etc) | 0.0 bp | | \$0 |
| Administrative costs (B) | 8.9 bp | | \$3,637 |
| Total plan costs (A + B) | 16.5 bp | | \$6,765 |
| Individual participant expenses | | | |
| Participant advice | 0.0 bp | | \$0 |
| Managed account fees | 0.0 bp | | \$0 |
| Other participant expenses (for loans, etc.) | 0.0 bp | | \$1 |
| Individual participant expenses | 0.0 bp | | \$1 |

Total plan cost comparisons

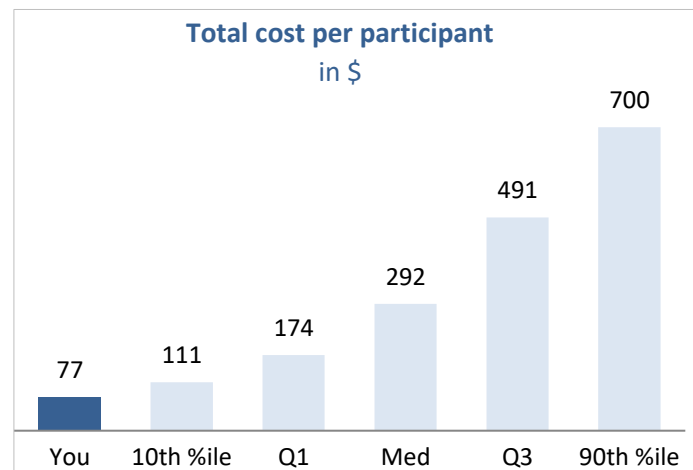
Total plan cost as a percentage of assets

Your total plan cost, excluding individual expenses, of 16.5 bps was below the U.S. universe median of 19.8 bps.



Total plan cost per participant

On a per participant basis, your total cost of \$77 was lower than the U.S. universe median of \$292.



As a fiduciary, it is very important that you assess whether your costs are reasonable. Comparing total plan cost provides limited insight because differences in total cost often reflect differences in the type of investment options offered. On the next few pages we compare costs and performance of each of the options your plan offers your participants against that of the total U.S. universe.

Option monitoring - Cost

Investment costs of your options are shown side by side with the median costs reported by the U.S. universe for similar options. (e.g. Your indexed Stock U.S. SMID Cap option (Small/Mid-Cap Stock Fund) is compared to indexed Stock U.S. SMID Cap options reported by others.)

Though the universe comparison is provided, it is inferior to peer-based analysis. Please refer to page 13 for more information.

Costs by investment option - 2021

| Investment option | | Cost Invest. Mgr. ¹ | | Option type | |
|-------------------|-------------------------------|--------------------------------|----------|-------------------------------|----------------------|
| Provider | Option name | Your | Univ med | Category | Indexed ² |
| BlackRock | Stock Fund | 1.0 bp | 1.3 bp | Stock U.S. Broad or Large Cap | ✓ |
| BlackRock | Small/Mid-Cap Stock Fund | 2.0 bp | 2.9 bp | Stock U.S. SMID Cap | ✓ |
| BlackRock | International Stock Fund | 6.0 bp | 6.0 bp | Stock Non U.S. | ✓ |
| BlackRock | Bond Fund | 3.0 bp | 3.0 bp | Bonds Broad | ✓ |
| BlackRock | Inflation-Protected Bond Fund | 3.0 bp | 3.0 bp | Bonds TIPS | ✓ |
| JPMorgan | High-Yield Bond Fund | 40.0 bp | 45.1 bp | Bonds High Yield | |
| Galliard | Stable Value Fund | 24.0 bp | 26.6 bp | Stable Value | |
| BlackRock | Money Market Fund | 8.0 bp | 9.5 bp | Cash, Money Market | |
| BlackRock | Retirement Portfolio | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | Target Date 2025 Portfolio | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | Target Date 2030 Portfolio | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | Target Date 2035 Portfolio | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | Target Date 2040 Portfolio | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | Target Date 2045 Portfolio | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | Target Date 2050 Portfolio | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | Target Date 2055 Portfolio | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | Target Date 2060 Portfolio | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | Target Date 2065 Portfolio | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | Global Real Estate Fund | 8.0 bp | 10.0 bp | REIT | ✓ |
| VRS | VRSIP | 60.0 bp | 41.0 bp | Other | |

1. Cost is the investment manager expense ratio of each investment option.

2. An option is indexed when the percent of passive management is greater than or equal to 80%.

Option monitoring - Performance

Similar to costs on the previous page, your performance is compared to the performance reported for similar options by the U.S. universe.

Returns and value added by investment option - 2021

| Investment option | | Net total return ¹ | | Net value added | | Option type | |
|-------------------|-------------------------------|-------------------------------|----------|-----------------|----------|-------------------------------|----------------------|
| Provider | Option name | Your | Univ med | Your | Univ med | Category | Indexed ² |
| BlackRock | Stock Fund | 28.7% | 28.7% | 0.0% | 0.0% | Stock U.S. Broad or Large Cap | ✓ |
| BlackRock | Small/Mid-Cap Stock Fund | 18.2% | 12.6% | 0.1% | 0.0% | Stock U.S. SMID Cap | ✓ |
| BlackRock | International Stock Fund | 8.6% | 8.7% | 0.1% | 0.1% | Stock Non U.S. | ✓ |
| BlackRock | Bond Fund | -1.6% | -1.7% | -0.1% | -0.1% | Bonds Broad | ✓ |
| BlackRock | Inflation-Protected Bond Fund | 5.9% | 5.8% | 0.0% | 0.0% | Bonds TIPS | ✓ |
| JPMorgan | High-Yield Bond Fund | 7.5% | 5.5% | 2.9% | 0.4% | Bonds High Yield | |
| Galliard | Stable Value Fund | 1.6% | 1.7% | 1.0% | 1.4% | Stable Value | |
| BlackRock | Money Market Fund | 0.2% | 0.0% | 0.1% | 0.0% | Cash, Money Market | |
| BlackRock | Retirement Portfolio | 7.0% | 8.3% | -0.1% | -0.1% | Target Date | ✓ |
| BlackRock | Target Date 2025 Portfolio | 9.1% | 8.3% | 0.1% | -0.1% | Target Date | ✓ |
| BlackRock | Target Date 2030 Portfolio | 11.4% | 12.8% | -0.1% | -0.1% | Target Date | ✓ |
| BlackRock | Target Date 2035 Portfolio | 13.8% | 12.8% | -0.1% | -0.1% | Target Date | ✓ |
| BlackRock | Target Date 2040 Portfolio | 16.0% | 16.0% | 0.0% | 0.0% | Target Date | ✓ |
| BlackRock | Target Date 2045 Portfolio | 17.7% | 16.0% | 0.0% | 0.0% | Target Date | ✓ |
| BlackRock | Target Date 2050 Portfolio | 18.7% | 17.0% | 0.1% | 0.0% | Target Date | ✓ |
| BlackRock | Target Date 2055 Portfolio | 18.8% | 17.0% | 0.0% | 0.0% | Target Date | ✓ |
| BlackRock | Target Date 2060 Portfolio | 18.8% | 17.0% | 0.0% | 0.0% | Target Date | ✓ |
| BlackRock | Target Date 2065 Portfolio | 18.8% | 17.0% | 0.0% | 0.0% | Target Date | ✓ |
| BlackRock | Global Real Estate Fund | 27.0% | 40.4% | 0.9% | -0.1% | REIT | ✓ |
| VRS | VRSIP | 18.6% | 17.9% | 5.0% | 1.1% | Other | |

1. Option net return = option provided return [returns provided are: net of investment and admin fees].

2. An option is indexed when the percent of passive management is greater than or equal to 80%.

Investment options and average total return

Investment options

Your plan offered 12 investment options in 2021. This was below the universe median of 14.

Offering more investment options to participants is not necessarily better. When there are too many choices, the process can be overwhelming to participants.

What is important is that you offer a diverse line-up with varying risk-return profiles and costs.

Type and number of investment options - 2021

| Option category | Your plan | Average | Median |
|-------------------------------|-----------|-------------|-----------|
| Stock Employer Discretionary | 0 | 0.5 | 0 |
| Stock U.S. | 2 | 4.9 | 4 |
| Stock Non U.S. & Global | 1 | 2.4 | 2 |
| Bonds | 3 | 2.6 | 2 |
| Balanced | 0 | 0.5 | 0 |
| Target Date ¹ | 1 | 0.9 | 1 |
| Stable Value & GIC | 1 | 0.7 | 1 |
| Cash, Money Market | 1 | 0.6 | 1 |
| Mutual Fund Window | 0 | 0.1 | 0 |
| Participant Brokerage Account | 1 | 0.4 | 0 |
| Real, Hedge, Other ex. Loans | 2 | 0.8 | 0 |
| Total (excl. Loans) | 12 | 14.6 | 14 |

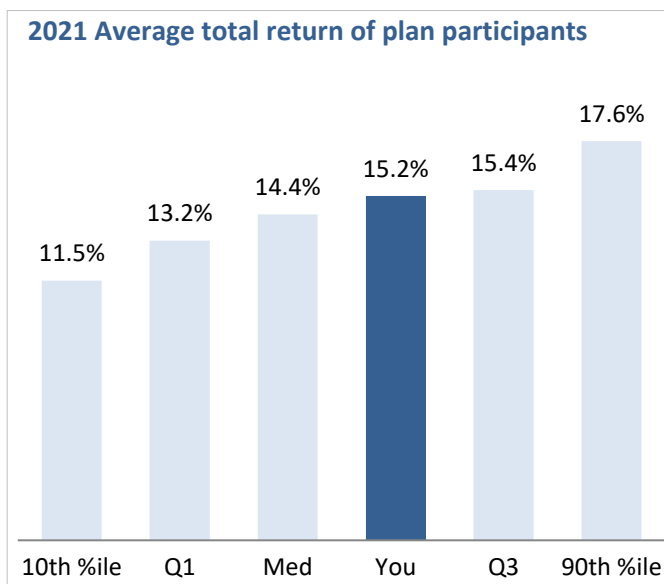
1. Target Date funds in one family are counted as one option.

Average total return of plan participants

Your plan participants' average net total return was 15.2% in 2021. This was above the U.S. universe median of 14.4%.

Average net total return measures the change in the average participant's account balance as a result of the net investment returns earned by their investment options weighted by their holdings.

There are two primary causes of differences in participants' average net total return: asset mix differences and value added performance. These are shown on the next page.



Asset mix and value added

Asset mix

As fiduciaries you should monitor asset mix because it is often the biggest reason for differences in the total returns of plan participants. Asset mix red-flags include high holdings of employer stock, cash, and stable value.

Asset mix is a function of the investment options offered and members' choices.

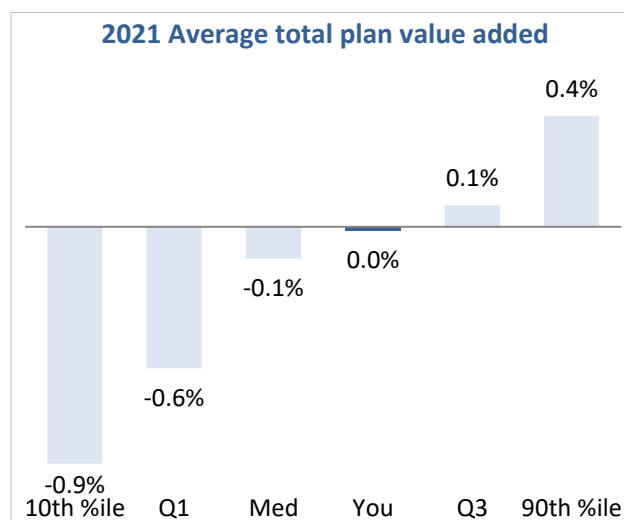
2021 Asset mix

| Option category | Your | | |
|-------------------------|------|---------|--------|
| | plan | Average | Median |
| Stock Employer | 0% | 7% | 2% |
| Stock U.S. | 42% | 35% | 36% |
| Stock Non U.S. & Global | 4% | 7% | 6% |
| Bonds | 6% | 6% | 6% |
| Target Date & Balanced | 28% | 32% | 29% |
| Stable Value & GIC | 12% | 8% | 6% |
| Cash, Money Market | 2% | 2% | 0% |
| MF & Brokerage Windows | 2% | 3% | 1% |
| Real, Hedge, Other | 3% | 1% | 1% |
| Total | 100% | 100% | |

Average total plan value added

The weighted average net value added earned across all of your plan's options was 0.0% in 2021. This was above the U.S. universe median of -0.1%.

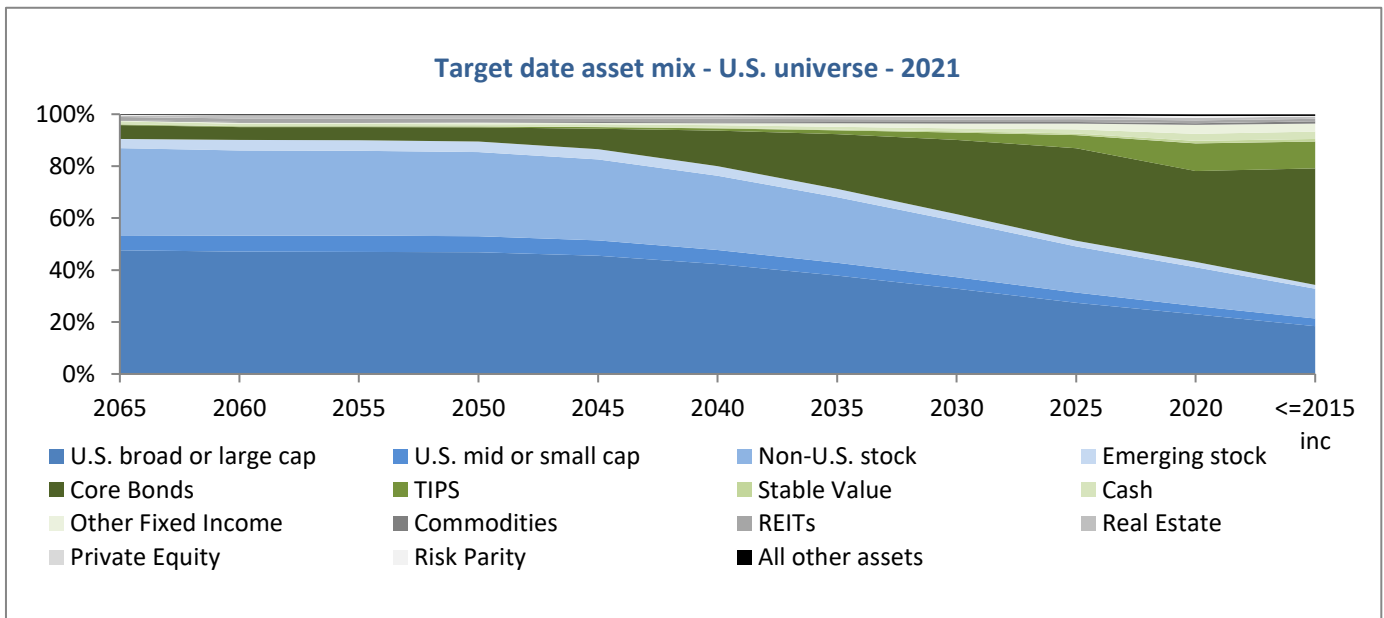
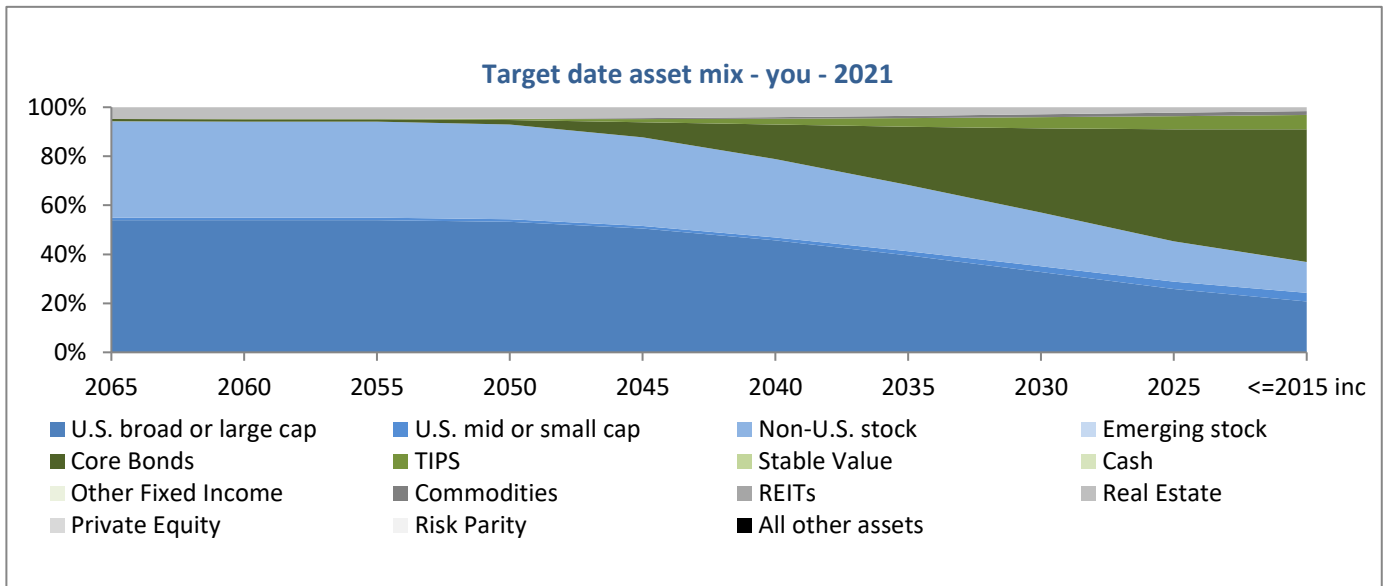
Positive value added indicates that, on average, your plan's investment options are outperforming their benchmark indices, whereas negative value added indicates that they are underperforming.



Asset mix of target date funds

Target date asset mix

The first graph is your target date asset allocation glide path. The one below is the U.S. average plan's glide path. On the next page, data is shown as percentages. Your plan offers a target date family and it is your default option.



Asset mix of target date funds

Target date asset mix - you - 2021

| Asset class | 2065 | 2060 | 2055 | 2050 | 2045 | 2040 | 2035 | 2030 | 2025 | 2020 | <=2015 inc |
|-------------------------|------|------|------|------|------|------|------|------|------|------|---------------|
| U.S. broad or large cap | 54% | 54% | 54% | 53% | 51% | 46% | 40% | 33% | 26% | -- | 21% |
| U.S. mid or small cap | 1% | 1% | 1% | 1% | 1% | 1% | 2% | 2% | 3% | -- | 4% |
| Non-U.S. stock | 39% | 39% | 39% | 39% | 36% | 32% | 27% | 22% | 16% | -- | 13% |
| Emerging stock | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | -- | 0% |
| Core Bonds | 1% | 1% | 1% | 2% | 6% | 14% | 24% | 34% | 46% | -- | 54% |
| TIPS | 0% | 0% | 0% | 0% | 1% | 2% | 4% | 5% | 5% | -- | 6% |
| Stable Value | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | -- | 0% |
| Cash | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | -- | 0% |
| Other Fixed Income | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | -- | 0% |
| Commodities | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | -- | 2% |
| REITs | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | -- | 0% |
| Real Estate | 5% | 5% | 5% | 5% | 4% | 4% | 3% | 3% | 2% | -- | 2% |
| Private Equity | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | -- | 0% |
| Risk Parity | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | -- | 0% |
| All other assets | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | -- | 0% |

Target date asset mix - U.S. universe - 2021

| Asset class | 2065 | 2060 | 2055 | 2050 | 2045 | 2040 | 2035 | 2030 | 2025 | 2020 | <=2015 inc |
|-------------------------|------|------|------|------|------|------|------|------|------|------|---------------|
| U.S. broad or large cap | 48% | 47% | 47% | 47% | 45% | 42% | 38% | 33% | 27% | 23% | 18% |
| U.S. mid or small cap | 6% | 6% | 6% | 6% | 6% | 5% | 5% | 4% | 4% | 3% | 3% |
| Non-U.S. stock | 34% | 33% | 33% | 32% | 31% | 29% | 25% | 22% | 18% | 15% | 11% |
| Emerging stock | 3% | 4% | 4% | 4% | 4% | 4% | 3% | 3% | 2% | 2% | 1% |
| Core Bonds | 5% | 5% | 5% | 5% | 8% | 14% | 21% | 29% | 36% | 35% | 45% |
| TIPS | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 3% | 5% | 11% | 10% |
| Stable Value | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% |
| Cash | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 2% | 3% | 3% |
| Other Fixed Income | 0% | 1% | 0% | 1% | 1% | 1% | 1% | 2% | 2% | 3% | 3% |
| Commodities | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% |
| REITs | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| Real Estate | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| Private Equity | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Risk Parity | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| All other assets | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% |

Cost effectiveness

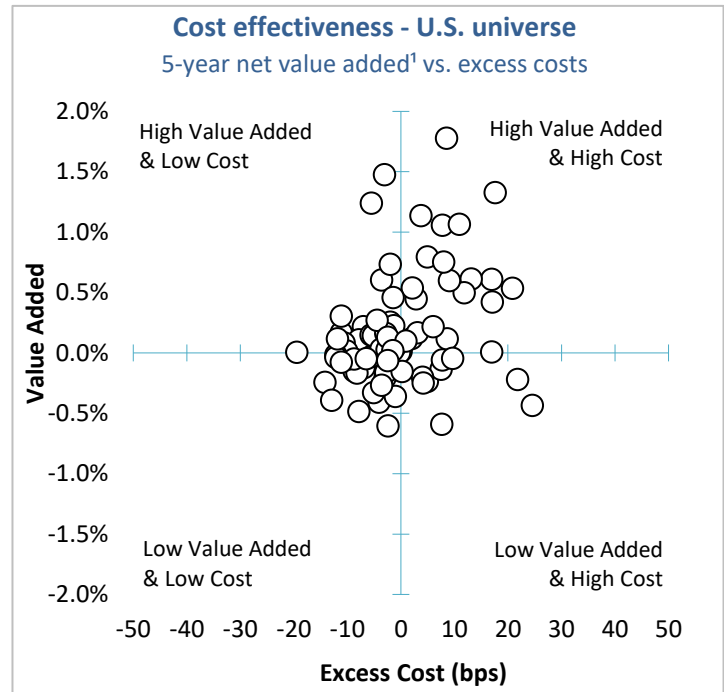
Cost effectiveness ranking

In an ideal world, the more you pay (i.e., the larger your excess cost) the more you get (i.e., the higher your value added). If this were true, you would see an upward sloping relationship in this graph. Clearly, this is not the case. CEM's research has shown consistently that there is no relationship between what plans spend and what they received.

It is however good to know where your plan places on the graph and, even more important, to understand the reasons why.

This report provides you with high-level insights of how your plan compared to the U.S. universe in 2021. CEM's new interactive online Dashboard provides much more insight, through a cost-effective channel. We invite you to review for yourself with a limited time free trial access. See next page for details.

Note that where indexed investment options are offered, net value added is not expected to be significant since the goal of an indexed option is to match the return of the underlying index.



1. Value added = net return - benchmark return. Value added from employer stock is neutralized by setting its benchmark return equal to its actual return. It is neutralized in this report so we can show the value added from diversified plan options. Similarly, value added for stable value options is neutralized because of concerns over the benchmarks used for these options.

Request a free trial of your CEM Dashboard to experience the benefits of upgrading to our premium benchmarking service

What is CEM Dashboard?

Our new interactive benchmarking service offered through our secure on-line portal. CEM's high standard of benchmarking analysis is provided through a cost-effective channel. It allows all fiduciaries or plan sponsors of DC plans the opportunity to perform their fee and performance review to the high standards required of them, thereby reducing litigation risks.

CEM Dashboard will provide you with:

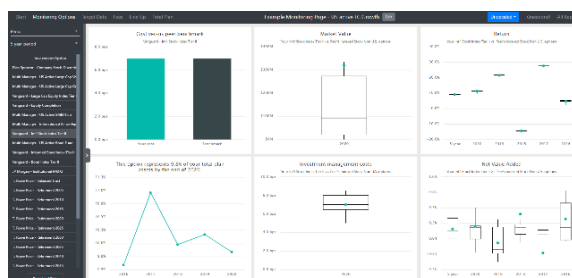
- A total plan benchmark cost using CEM's proprietary peer based analysis, which adjusts for all factors that impact fees. Peers are custom selected based on similarly sized plans, one of the factors that impacts fees. This analysis is superior to the total plan benchmark cost previously included in this PDF report.
- A benchmark cost for each investment option, as well as performance metrics, giving you the context and information you need to properly monitor your investment options. Universe based benchmarks (i.e. page 6 of this report) are inferior to peer-based, especially for outlier sized plans.
- Analysis of target date glide path and risk, and a benchmark cost estimate which adjusts for glide path and other fee drivers.
- Peer based analysis of recordkeeping, and other administrative and participant expenses (such as managed account fees).

You now have two upgrade options:

1. CEM Dashboard
2. BenchmarkDC, our comprehensive benchmarking report, which includes the Dashboard.

| | Dashboard | Comprehensive |
|--|-----------|---------------|
| Access to CEM Dashboard | ✓ | ✓ |
| CEM's proprietary peer based benchmark cost analysis | ✓ | ✓ |
| Comparisons against your choice of universe & peers | ✓ | ✓ |
| Comprehensive results and insights in an 80+ page PDF report | | ✓ |
| In-person meeting and presentation | | ✓ |
| Virtual access to CEM for research, questions and help | limited | unlimited |

To learn more click on the video below:



To request your 2-week trial contact:

Quentin Spehner
Quentin@cembenchmarking.com

Appendix: Your survey responses

Data quality

We recognize that the value of the information contained in these reports is only as good as the quality of the data we receive. Therefore, we work very hard at getting good data. Our procedures for checking and improving the data include:

- Improved Survey Clarity - 25 years of feedback from survey participants has led to improved definitions and survey clarity.
- Computer and Analyst Verification - We compare responses to norms for the survey universe and to each sponsor's prior year data when available. This typically results in questions that we send to each survey respondent and follow-up by email and/or phone.

In addition, the quality of our data continues to improve because of:

- Learning Curve - This is our 25th year of gathering this data and experience is teaching us and the participants how to do a better job.
- Growing Universe - As our universe of respondents continues to increase in size, so does our confidence in the results as unbiased errors tend to average themselves out. As a result of the above, data quality has improved dramatically over the twenty five year period we have been benchmarking. We feel there will always be room for improvement and we welcome any suggestions on how to further improve data quality.

Your survey responses

Your data is summarized on the following pages. As discussed with you (or the person who provided your plan's data) during the data confirmation process, your original survey responses may have changed for the following reasons:

- 1. Gross versus Net Returns** - We permit participants to report returns on either a net or gross basis. In order to ensure 'apples-to-apples' comparisons, we compare returns net of all costs, including administration costs.
- 2. Returns not available** - We request that you leave the return blank if a full year return was unavailable for an investment option. The default for an unavailable return is to exclude this investment option from the net value added calculations.
- 3. Costs not provided** - One of our key themes is that you must know your costs if you want to manage your plan effectively. We recognize, however, that some costs such as Fiduciary Oversight costs can be difficult to obtain. Therefore, if you were unable to provide us with your costs, or your best estimate of these costs, we imputed a figure using industry data.

Your survey responses

Virginia Retirement System

| General | 2021 | 2020 | 2019 | 2018 | 2017 |
|--|----------------|----------------|----------------|----------------|----------------|
| Contact | Laura Pugliese | Laura Pugliese | Laura Pugliese | Laura Pugliese | Laura Pugliese |
| Data provided by: | Michael Scott | Michael Scott | Michael Scott | Michael Scott | Michael Scott |
| Corporate, public, other? | Public | Public | Public | Public | Public |
| Market value of plan assets (\$ millions) | \$4,383 | \$3,807 | \$3,074 | \$2,558 | \$2,651 |
| Number of plan participants | 87,898 | 86,683 | 80,954 | 79,906 | 78,542 |
| % of eligible employees participating | 28% | 28% | 27% | 32% | 33% |
| Are some DC participants covered by a DB plan? | Yes Some | Yes Some | Yes Some | Yes Some | Yes Some |
| Administrative costs, plan expenses (\$000s) | 2021 | 2020 | 2019 | 2018 | 2017 |
| Recordkeeping ¹ | | | | | |
| paid from expense ratio of invest. options charged to individuals or participant accounts paid by plan sponsor | 2,936 | 2,433 | 2,291 | 2,298 | 2,290 |
| Custodial & trustee | | | | | |
| paid from expense ratio of invest. options charged to individuals or participant accounts paid by plan sponsor | | | | | |
| Oversight internal ² | | | | | |
| paid from expense ratio of invest. options charged to individuals or participant accounts paid by plan sponsor | 701 | 781 | 835 | 878 | 628 |
| Consulting | | | | | |
| paid from expense ratio of invest. options charged to individuals or participant accounts paid by plan sponsor | | | | | |
| Other | | | | | |
| paid from expense ratio of invest. options charged to individuals or participant accounts paid by plan sponsor | | | | | |
| less rebates to participants from reimburse. accounts | | | | | |
| Total Plan Expenses | 3,637 | 3,214 | 3,126 | 3,176 | 2,918 |
| Participant Expenses (\$000s) | 2021 | 2020 | 2019 | 2018 | 2017 |
| Participant advice | | | | | |
| paid from expense ratio of invest. options charged to individuals or participant accounts paid by plan sponsor | | | | | |
| Managed account fees | | | | | |
| paid from expense ratio of invest. options charged to individuals or participant accounts paid by plan sponsor | | | | | |
| Other participant expenses (for loans, QDROs, etc.) | | | | | |
| paid from expense ratio of invest. options charged to individuals or participant accounts paid by plan sponsor | 1 | 12 | 7 | 3 | 3 |
| Total Participant Expenses | 1 | 12 | 7 | 3 | 3 |

1. If you were unable to provide a breakdown of your administrative & fiduciary costs, the total was included in recordkeeping because it usually represents the bulk of administrative & fiduciary costs.

2. If you were unable to provide costs for Fiduciary oversight internal, we applied a default value. If the number of internal FTEs is available, default equals \$100,000 x FTE. Otherwise, it is 0.0001 x Market value of plan assets.

Your survey responses

Virginia Retirement System

| About your options | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|------------------------|------------------------|------------------------|------------------------|------------------------|
| Do you have a default investment option? | Yes | Yes | Yes | Yes | Yes |
| If yes, what is the default option? | Target / lifecycle | Target / lifecycle | Target / lifecycle | Target / lifecycle | Target / lifecycle |
| Option returns are: | Net mgmt & admin fees | Net mgmt fees | Net mgmt fees | Net mgmt fees | Net mgmt fees |
| Cost drivers and allocation | 2021 | 2020 | 2019 | 2018 | 2017 |
| FTE fulfilling fiduciary/oversight functions | 7.0 | 7.0 | 7.0 | 7.0 | 11.0 |
| Does the plan offer a managed account service? | No | No | No | No | No |
| Number with managed accounts | | | | | |
| Market value in managed accounts | | | | | |
| Do you receive revenue sharing from your providers? | No | No | No | No | No |
| Is it used to reduce management fee? | | | | | |
| Is it used to reduce admin. or fiduciary costs? | | | | | |
| How are the recordkeeping or admin costs allocated to participants (asset based, flat fee, both, or other)? | flat fee | flat fee | flat fee | flat fee | flat fee |
| If other, describe | | | | | |
| Contributions | 2021 | 2020 | 2019 | 2018 | 2017 |
| Employer contributions (\$ millions) | | 0 | 0 | 0 | 0 |
| Participant contributions (\$ millions) | 177 | 167 | 150 | 144 | 137 |
| % of participants making voluntary contributions? | | 100% | 100% | | |
| Stable Value Funds | 2021 | 2020 | 2019 | 2018 | 2017 |
| What percentage of stable value assets are wrapped? | | | | | 100% |
| What are your total wrap fees (in bps over wrapped amount) | | | | | |
| Loan features | 2021 | 2020 | 2019 | 2018 | 2017 |
| Does your plan allow loans? | No | No | No | No | No |
| Total number of outstanding loans | | | | | |
| Average loan balance, (\$) | | | | | |
| Does your plan allow for hardship withdrawals | Yes | Yes | Yes | Yes | Yes |
| Who pays the loan initiation fee? | | | | | |
| Is the fee a flat dollar amount or % of assets? | | | | | |
| Participant transaction rules and restrictions | 2021 | 2020 | 2019 | 2018 | 2017 |
| Limits on the number of transactions? | No | No | No | No | No |
| Limits on international funds? | No | No | No | No | No |
| Limits on any other funds (excl. international)? | | | | | |
| Excessive trading penalties? | | | | | |
| Describe other limits if any | 90 day equity wash for | 90 day equity wash for | 90 day equity wash for | 90 day equity wash for | 90 day equity wash for |
| Assumed retirement age for your target date funds | 65 | 65 | 65 | | 65 |
| Do you customize or use an off shelf target date fund? | Off shelf | Off shelf | Off shelf | Off shelf | Off shelf |
| Age at which target date retirement funds stop de-risking | 65 | 65 | 65 | 65 | |

Your survey responses

Virginia Retirement System

| Services Offered to Separated Employees | 2021 | 2020 | 2019 | 2018 | 2017 |
|--|-------------|-------------|-------------|-------------|-------------|
| Lump sum payouts | Yes | Yes | Yes | Yes | Yes |
| Required Minimum Distribution (RMD) payouts | Yes | Yes | Yes | Yes | Yes |
| Partial payouts | Yes | Yes | Yes | Yes | Yes |
| Installment payouts (e.g., monthly, quarterly, etc.) | Yes | Yes | Yes | Yes | Yes |
| Loan initiation | No | No | No | No | No |
| Loan maintenance (for loans made prior to separation) | No | No | No | No | No |
| Online advice service | No | No | No | No | No |
| Managed account advice service | No | No | No | No | No |
| One-on-one advice service with an advisor | No | No | No | No | No |
| Annuity platform (whether in-plan or out-of-plan) | Yes | Yes | Yes | Yes | Yes |
| Employee contributions (DC is primary, no DB) | 2021 | 2020 | 2019 | 2018 | 2017 |
| Can participants make: | | | | | |
| a. After-tax Roth 401(k) contributions? | Yes | Yes | Yes | Yes | Yes |
| b. After-tax non-Roth 401(k) contributions? | No | No | No | No | No |
| Is investment in employer stock required to some extent? | No | No | | | |
| Is there a mandatory fixed or minimum contribution rate for full-time employees? | No | No | No | No | No |
| If yes, what is the mandatory contribution rate as a % of salary ? | | | | | |
| Does the plan have automatic enrolment? | Yes | Yes | Yes | Yes | Yes |
| If yes: | | | | | |
| a. Initial automatic contribution as a % of salary | | | | | |
| b. What (if any) is the automatic annual increase in the contribution rate? | | | | | |
| c. Maximum rate achieved via automatic increases? | | | | | |
| Applied to all/new employees only when introduced? | Yes | Yes | Yes | Yes | Yes |
| Employee contributions (DC is suppl. to DB) | 2021 | 2020 | 2019 | 2018 | 2017 |
| Can participants make: | | | | | |
| a. After-tax Roth 401(k) contributions? | Yes | Yes | Yes | Yes | Yes |
| b. After-tax non-Roth 401(k) contributions? | No | No | No | No | No |
| Is investment in employer stock required to some extent? | No | No | | | |
| Is there a mandatory fixed or minimum contribution rate for full-time employees? | No | No | No | No | No |
| If yes, what is the mandatory contribution rate as a % of salary ? | | | | | |
| Does the plan have automatic enrolment? | Yes | Yes | Yes | Yes | Yes |
| If yes: | | | | | |
| a. Initial automatic contribution as a % of salary | | | | | |
| b. What (if any) is the automatic annual increase in the contribution rate? | | | | | |
| c. Maximum rate achieved via automatic increases? | | | | | |
| Applied to all employees or new only when introduced? | Yes | Yes | Yes | Yes | Yes |

Your survey responses

Virginia Retirement System

| Employer contributions (if DC is primary, no DB) | 2021 | 2020 | 2019 | 2018 | 2017 |
|--|------|------|------|------|------|
| Are employer contributions made in employer stock, cash or both? | | | | | |
| Is there a profit sharing component to employer contributions? | No | No | No | | |
| Is there an automatic fixed employer contribution rate? If yes, what is the automatic fixed employer contribution rate? | No | No | No | | |
| Is there an after-tax employer match? | | | | | |
| Is there a before-tax employer match? | | | | | |
| % of participants earning the maximum match | | | | | |
| Indicate the match terms below: | | | | | |
| Percentage match on the first: | | | | | |
| Percentage of salary contributed: | | | | | |
| Percentage on the next: | | | | | |
| Percentage of salary contributed: | | | | | |
| Or describe: | | | | | |

| Employer contributions (if DC is suppl. to DB) | 2021 | 2020 | 2019 | 2018 | 2017 |
|--|------|------|------|------|------|
| Are employer contributions made in employer stock, cash or both? | | | | | |
| Is there a profit sharing component to employer contributions? | No | No | No | | |
| Is there an automatic fixed employer contribution rate? If yes, what is the automatic fixed employer contribution rate? | No | No | No | | |
| Is there an after-tax employer match? | | | | | |
| Is there a before-tax employer match? | | | | | |
| % of participants earning the maximum match | | | | | |
| Indicate the match terms below: | | | | | |
| Percentage match on the first: | | | | | |
| Percentage of salary contributed: | | | | | |
| Percentage on the next: | | | | | |
| Percentage of salary contributed: | | | | | |
| Or describe: | | | | | |

Your survey responses

Virginia Retirement System

| Fiduciary | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|-------------|-------------|-------------|-------------|-------------|
| Named fiduciary? | Board | Board | Board | Board | Board |
| If named fiduciary is a committee: | | | | | |
| Number of committee members? | | | | | |
| Number of meetings in the past year? | | | | | |
| Are the meeting minutes documented? | | | | | |
| Are the named fiduciaries: | | | | | |
| Provided formal training? | Yes | Yes | Yes | Yes | Yes |
| Required to sign an acknowledgement form? | Yes | Yes | Yes | Yes | Yes |
| Have third parties been appointed as: | | | | | |
| • Investment manager with full discretionary powers for selecting, monitoring, replacing investment options | No | No | No | No | No |
| • Investment advisor to provide advice regarding the selection and retention of investment options? | No | No | No | No | No |
| • Plan administrator responsible for regulatory filings, disclosures to participants and hiring plan service providers if no other fiduciary has that responsibility? | Yes | Yes | Yes | No | No |
| Is there documentation that identifies the process for: | | | | | |
| • Selection and monitoring of third-party fiduciaries and other plan service providers? | Yes | Yes | Yes | Yes | Yes |
| • Investment policy | Yes | Yes | Yes | Yes | Yes |
| • Oversight of internal employees involved in operating the plan (i.e., internal fiduciaries, HR staff enrolling employees in the plan, posting deferrals, etc) | Yes | Yes | Yes | Yes | Yes |
| • Fulfilling administration responsibilities (regulatory filings, disclosures to participants) | Yes | Yes | Yes | Yes | Yes |
| Education and other | 2021 | 2020 | 2019 | 2018 | 2017 |
| Is individual investment counseling/advice offered to plan participants? | No | No | No | No | No |
| • Is it provided by advisor, computer, both? | | | | | |
| Does your plan offer financial education via: | | | | | |
| • Group meetings? | Yes | Yes | Yes | Yes | Yes |
| • One-on-one meetings? | Yes | Yes | Yes | Yes | Yes |
| Do plan participants receive projections of annual income in retirement: | | | | | |
| • In their participant statements? | Yes | Yes | Yes | Yes | Yes |
| • Online? | Yes | Yes | Yes | Yes | Yes |
| • Via separate communication? | No | No | No | No | No |
| Does your plan have marketing campaigns to: | | | | | |
| • Increase employee contribution/deferral rates? | Yes | Yes | Yes | Yes | Yes |
| • Increase participation by eligible non-participants? | Yes | Yes | Yes | Yes | Yes |
| • Educate on the savers tax credit for lower income participants? | Yes | Yes | | Yes | Yes |
| • Improve diversification from Employer Stock? | No | No | No | No | No |
| Does your plan offer: | | | | | |
| • Out-of-plan guaranteed lifetime income product? | Yes | Yes | Yes | Yes | Yes |
| • In-plan guaranteed lifetime income product? | No | No | No | No | No |
| Does your plan offer automatic rebalancing? | Yes | Yes | Yes | Yes | No |

Your survey responses

Virginia Retirement System

Your plan's 2021 investment options

| Provider & Option name | Type | % Inxd | \$ mils at 12/31/21 | Annual Return | Description | Benchmark | Cost | | | |
|---|----------------------------|--------|---------------------|---------------|--|-----------|--------|---------------|---------------|---------------|
| | | | | | | | Return | Invest | Admin | Total |
| BlackRock - Stock Fund | Stk U.S. Broad or LC | 100% | 1,454 | 28.7% | S&P 500 | | 28.7% | 1.0 bp | 0.0 bp | 1.0 bp |
| BlackRock - Small/Mid-Cap Stock Fund | Stk U.S. SMID Cap | 100% | 408 | 18.2% | Russell 2500 | | 18.2% | 2.0 bp | 0.0 bp | 2.0 bp |
| BlackRock - International Stock Fund | Stk Non U.S. | 100% | 195 | 8.6% | MSCI ACWI ex-U.S Index IMI Index Linked | | 8.5% | 6.0 bp | 0.0 bp | 6.0 bp |
| BlackRock - Bond Fund | Bonds Broad | 100% | 153 | -1.6% | Barclays Aggregate Bond Index | | -1.5% | 3.0 bp | 0.0 bp | 3.0 bp |
| BlackRock - Inflation-Protected Bond Fund | Bonds TIPS | 100% | 51 | 5.9% | Barclays U.S. Treasury TIPS Index | | 6.0% | 3.0 bp | 0.0 bp | 3.0 bp |
| JPMorgan - High-Yield Bond Fund | Bonds High Yield | 0% | 44 | 7.5% | ICE BofA Merrill Lynch U.S. High-Yield B | | 4.6% | 40.0 bp | 0.0 bp | 40.0 bp |
| Galliard - Stable Value Fund | Stable Value | 0% | 523 | 1.6% | [50% 2-Year CMT/50% 3-Year CMT] + 0.25%* | | 0.6% | 24.0 bp | 0.0 bp | 24.0 bp |
| BlackRock - Money Market Fund | Cash, Money Mrkt | 0% | 75 | 0.2% | Barclays 3-Month Treasury Bill Index | | 0.1% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - Retirement Portfolio | Target Date Short | 98% | 316 | 7.0% | Custom | | 7.0% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - Target Date 2025 Portfolio | Target Date Short | 99% | 233 | 9.1% | Custom | | 9.0% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - Target Date 2030 Portfolio | Target Date Medium | 99% | 191 | 11.4% | Custom | | 11.5% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - Target Date 2035 Portfolio | Target Date Medium | 99% | 170 | 13.8% | Custom | | 13.9% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - Target Date 2040 Portfolio | Target Date Long | 99% | 123 | 16.0% | Custom | | 16.0% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - Target Date 2045 Portfolio | Target Date Long | 100% | 92 | 17.7% | Custom | | 17.7% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - Target Date 2050 Portfolio | Target Date Very Long | 100% | 64 | 18.7% | Custom | | 18.6% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - Target Date 2055 Portfolio | Target Date Very Long | 100% | 38 | 18.8% | Custom | | 18.8% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - Target Date 2060 Portfolio | Target Date Very Long | 100% | 11 | 18.8% | Custom | | 18.8% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - Target Date 2065 Portfolio | Target Date Very Long | 100% | 3 | 18.8% | Custom | | 18.8% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - Global Real Estate Fund | REIT | 100% | 99 | 27.0% | Your REIT benchmark | | 26.1% | 8.0 bp | 0.0 bp | 8.0 bp |
| VRS - VRSIP | Other | 1% | 46 | 18.6% | CUSTOM | | 13.6% | 60.0 bp | 0.0 bp | 60.0 bp |
| Ameritrade - Self Directed Brokerage | Participant Broker Account | 0% | 94 | | | | | 0.0 bp | 0.0 bp | 0.0 bp |
| Total | | | 4,383 | | | | | 7.6 bp | 0.0 bp | 7.6 bp |

CEM Defined Contribution Survey Results

2021 Investment Benchmarking Analysis for
VA ORPHE – TIAA

Thank you for participating in CEM's annual Defined Contribution survey. Your results are only provided to you. Confidentiality of your data is strictly maintained.



CEM presents your 2021 benchmarking results!

We are pleased to present the 25th edition of the annual CEM Benchmarking results for defined contribution plans. In this complimentary PDF report, you will find a basic set of comparisons of your plan's 2021 investment option returns and costs to the U.S. universe.

In 2021 we introduced an improved benchmark cost calculation through the CEM Dashboard, our interactive online benchmarking service. The Dashboard includes your benchmark cost, calculated based on a custom selected group of similar-sized peers, adjusted for factors that impact fees. The CEM Dashboard contains our highest standard of fee and performance benchmarking analysis provided through a cost-effective, self-service channel. In addition, the Dashboard provides multi-year views and deeper insights into the cost and performance of your options, administrative and participant expenses, target date funds, and the line up. Please refer to page 13 for more details and access to a complimentary trial of this dashboard.

Feel free to contact us, if you have any questions, comments, or want to discuss your results. Our team is here to help you get the most out of benchmarking.

Thank you for your participation. We look forward to working with you again next year.

CEM Investment Benchmarking Team.

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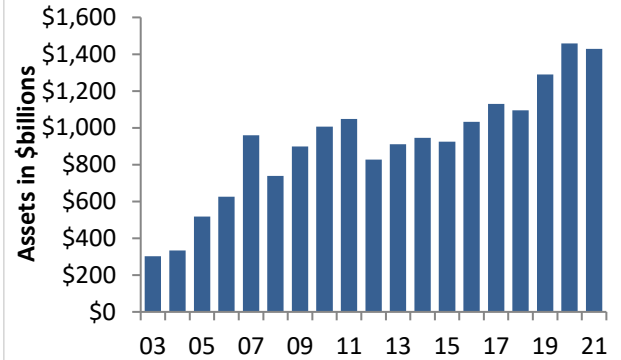
CEM U.S. defined contribution database

Database participation

CEM has been benchmarking the costs and performance of U.S. defined contribution plans, in a uniform basis, since 1997. In this free report, our thank you for participating in our database, your costs and performance are compared to the 2021 CEM universe, which consists of:

- 123 defined contribution plans aggregating \$1,428 billion.
- 99 corporate plans and 24 public plans.

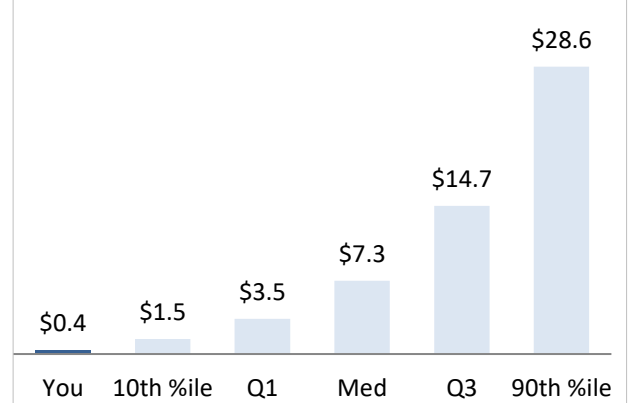
U.S. defined contribution universe: Total participating assets



Plan size

Your plan had \$0.4 billion in total assets (measured as the sum of option holdings) at the end of 2021. This was below the U.S. universe median of \$7.3 billion.

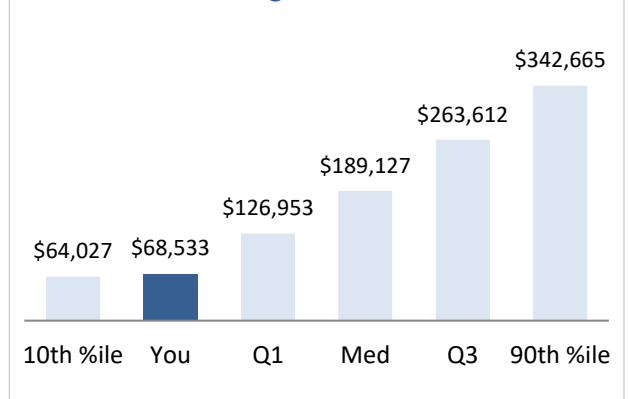
2021 Plan size, bln



Average account balance

The average account balance of your plan participants was \$68,533 in 2021. This compares to the U.S. universe median of \$189,127. Differences in average account balance reflect many factors including contribution rates, participant demographics and matching rates.

2021 Average account balance



Your 2021 total plan costs

Calculating your costs

Your plan's total cost in 2021, excluding individual participant expenses, was \$0.8 million which equals 24.6 bps on total assets or \$153 per participant.

1. Costs in dollars were estimated as 'basis point cost provided' x 'option average holdings', where [average holdings=(beginning of year + end of year)/2]. If beginning of year holdings were not available (you did not participate last year), then we estimated it as [beginning of year holdings=end of year holdings / (1 + return on holdings)].

2. Total expense ratio (9.5 bps) = average of option expense ratios weighted by option assets avg. Total \$ expense ratio (311) = plan total avg. assets (326) x expense ratio (9.5 bps). Plan total average assets (326) = (total assets eoy 2021 (357) + total assets eoy 2020 (294)) / 2.

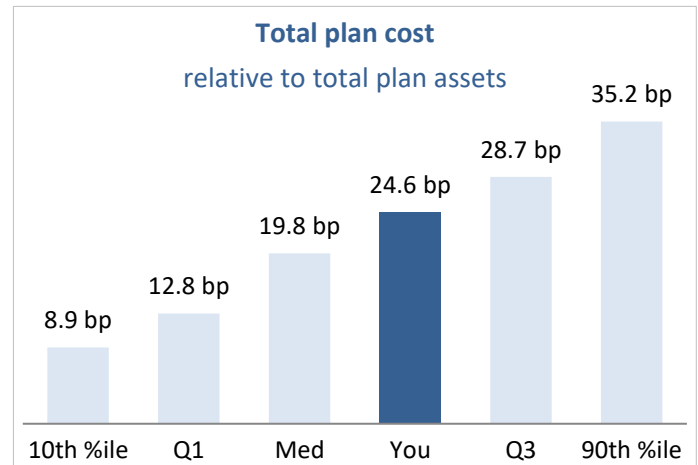
3. Defaults were applied if you were unable to provide cost for recordkeeping or internal oversight.

| Investment options | Expense ratio in bp | Assets Avg | Inv. Costs \$000s ¹ |
|---|---------------------|--------------|--------------------------------|
| BlackRock - BlackRock Equity Index Fund J | 1.0 bp | 34 | |
| BlackRock - BlackRock Russell 2500 Index Fund M | 4.0 bp | 9 | |
| BlackRock - BlackRock MSCI ACWI IMI Index Non-Lendable Fund M | 5.0 bp | 43 | |
| BlackRock - BlackRock MSCI ACWI ex-U.S. IMI Index Fund M | 11.0 bp | 17 | |
| BlackRock - BlackRock U.S. Debt Index Fund M | 3.0 bp | 9 | |
| BlackRock - BlackRock U.S. TIPS Fund M | 3.0 bp | 5 | |
| BlackRock - BlackRock Short-Term Investment Fund W | 8.0 bp | 6 | |
| BlackRock - BlackRock LifePath Index Retirement O | 8.0 bp | 29 | |
| BlackRock - BlackRock LifePath Index 2025 Fund O | 8.0 bp | 22 | |
| BlackRock - BlackRock LifePath Index 2030 Fund O | 8.0 bp | 29 | |
| BlackRock - BlackRock LifePath Index 2035 | 8.0 bp | 23 | |
| BlackRock - BlackRock LifePath Index 2040 Fund O | 8.0 bp | 25 | |
| BlackRock - BlackRock LifePath Index 2045 Fund O | 8.0 bp | 22 | |
| BlackRock - BlackRock LifePath Index 2050 Fund O | 8.0 bp | 12 | |
| BlackRock - BlackRock LifePath Index 2055 Index Fund O | 8.0 bp | 5 | |
| BlackRock - BlackRock LifePath Index 2060 Index Fund O | 8.0 bp | 1 | |
| BlackRock - BlackRock LifePath Index 2065 Fund O | 8.0 bp | 1 | |
| TIAA Real Estate Account - Real Estate Fund | 63.0 bp | 9 | |
| TIAA Traditional Annuity RC - Traditional Annuity Fund | 30.0 bp | 21 | |
| TIAA-CREF Self Directed Account - Participant Brokerage Account | n/a | n/a | |
| Total expense ratio, investment manager (A)² | 9.5 bp | \$326 | \$311 |
| Administrative expenses³ | | | |
| Recordkeeping and administration | 11.1 bp | | \$363 |
| Custodial and trustee | 0.0 bp | | \$0 |
| Internal oversight | 5.5 bp | | \$180 |
| Consulting | 0.0 bp | | \$0 |
| Other plan costs (legal, audit, etc) | 0.0 bp | | \$0 |
| less rebates to participants | 1.6 bp | | \$53 |
| Administrative costs after rebates (B) | 15.0 bp | | \$490 |
| Total plan costs (A + B) | 24.6 bp | | \$800 |
| Individual participant expenses | | | |
| Participant advice | 0.0 bp | | \$0 |
| Managed account fees | 0.0 bp | | \$0 |
| Other participant expenses (for loans, etc.) | 0.0 bp | | \$0 |
| Individual participant expenses | 0.0 bp | | \$0 |

Total plan cost comparisons

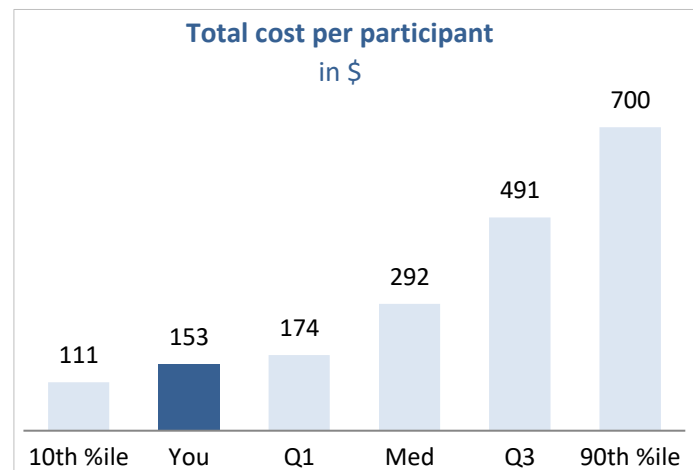
Total plan cost as a percentage of assets

Your total plan cost, excluding individual expenses, of 24.6 bps was above the U.S. universe median of 19.8 bps.



Total plan cost per participant

On a per participant basis, your total cost of \$153 was lower than the U.S. universe median of \$292.



As a fiduciary, it is very important that you assess whether your costs are reasonable. Comparing total plan cost provides limited insight because differences in total cost often reflect differences in the type of investment options offered. On the next few pages we compare costs and performance of each of the options your plan offers your participants against that of the total U.S. universe.

Option monitoring - Cost

Investment costs of your options are shown side by side with the median costs reported by the U.S. universe for similar options. (e.g. Your indexed Stock U.S. SMID Cap option (BlackRock Russell 2500 Index Fund M) is compared to indexed Stock U.S. SMID Cap options reported by others.)

Though the universe comparison is provided, it is inferior to peer-based analysis. Please refer to page 13 for more information.

Costs by investment option - 2021

| Investment option | | Cost Invest. Mgr. ¹ | | Option type | |
|-----------------------------|---|--------------------------------|----------|-------------------------------|----------------------|
| Provider | Option name | Your | Univ med | Category | Indexed ² |
| BlackRock | BlackRock Equity Index Fund J | 1.0 bp | 1.3 bp | Stock U.S. Broad or Large Cap | ✓ |
| BlackRock | BlackRock Russell 2500 Index Fund M | 4.0 bp | 2.9 bp | Stock U.S. SMID Cap | ✓ |
| BlackRock | BlackRock MSCI ACWI IMI Index Non-Lendable Fund M | 5.0 bp | 5.0 bp | Stock Global | ✓ |
| BlackRock | BlackRock MSCI ACWI ex-U.S. IMI Index Fund M | 11.0 bp | 6.0 bp | Stock Non U.S. | ✓ |
| BlackRock | BlackRock U.S. Debt Index Fund M | 3.0 bp | 3.0 bp | Bonds Broad | ✓ |
| BlackRock | BlackRock U.S. TIPS Fund M | 3.0 bp | 3.0 bp | Bonds TIPS | ✓ |
| BlackRock | BlackRock Short-Term Investment Fund W | 8.0 bp | 9.5 bp | Cash, Money Market | |
| BlackRock | BlackRock LifePath Index Retirement O | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2025 Fund O | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2030 Fund O | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2035 | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2040 Fund O | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2045 Fund O | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2050 Fund O | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2055 Index Fund O | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2060 Index Fund O | 8.0 bp | 6.0 bp | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2065 Fund O | 8.0 bp | 6.0 bp | Target Date | ✓ |
| TIAA Real Estate Account | Real Estate Fund | 63.0 bp | 64.0 bp | Real Estate | |
| TIAA Traditional Annuity RC | Traditional Annuity Fund | 30.0 bp | 30.0 bp | Annuity | |

1. Cost is the investment manager expense ratio of each investment option.

2. An option is indexed when the percent of passive management is greater than or equal to 80%.

Option monitoring - Performance

Similar to costs on the previous page, your performance is compared to the performance reported for similar options by the U.S. universe.

Returns and value added by investment option - 2021

| Investment option | | Net total return ¹ | | Net value added | | Option type | |
|-----------------------------|---|-------------------------------|----------|-----------------|----------|-------------------------------|----------------------|
| Provider | Option name | Your | Univ med | Your | Univ med | Category | Indexed ² |
| BlackRock | BlackRock Equity Index Fund J | 28.7% | 28.7% | 0.0% | 0.0% | Stock U.S. Broad or Large Cap | ✓ |
| BlackRock | BlackRock Russell 2500 Index Fund M | 18.2% | 12.6% | 0.0% | 0.0% | Stock U.S. SMID Cap | ✓ |
| BlackRock | BlackRock MSCI ACWI IMI Index Non-Lendable Fund M | 18.3% | 15.3% | 0.1% | 0.0% | Stock Global | ✓ |
| BlackRock | BlackRock MSCI ACWI ex-U.S. IMI Index Fund M | 8.6% | 8.7% | 0.0% | 0.1% | Stock Non U.S. | ✓ |
| BlackRock | BlackRock U.S. Debt Index Fund M | -1.6% | -1.7% | -0.1% | -0.1% | Bonds Broad | ✓ |
| BlackRock | BlackRock U.S. TIPS Fund M | 5.9% | 5.8% | 0.0% | 0.0% | Bonds TIPS | ✓ |
| BlackRock | BlackRock Short-Term Investment Fund W | 0.2% | 0.0% | 0.1% | 0.0% | Cash, Money Market | |
| BlackRock | BlackRock LifePath Index Retirement O | 7.0% | 8.3% | -0.1% | -0.1% | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2025 Fund O | 9.1% | 8.3% | 0.0% | -0.1% | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2030 Fund O | 11.4% | 12.8% | -0.1% | -0.1% | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2035 | 13.8% | 12.8% | -0.1% | -0.1% | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2040 Fund O | 16.0% | 16.0% | 0.0% | 0.0% | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2045 Fund O | 17.7% | 16.0% | 0.0% | 0.0% | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2050 Fund O | 18.7% | 17.0% | 0.1% | 0.0% | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2055 Index Fund O | 18.8% | 17.0% | 0.0% | 0.0% | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2060 Index Fund O | 18.8% | 17.0% | 0.0% | 0.0% | Target Date | ✓ |
| BlackRock | BlackRock LifePath Index 2065 Fund O | 18.8% | 17.0% | 0.0% | 0.0% | Target Date | ✓ |
| TIAA Real Estate Account | Real Estate Fund | 17.9% | 21.7% | -1.0% | -1.1% | Real Estate | |
| TIAA Traditional Annuity RC | Traditional Annuity Fund | n/a | 3.6% | n/a | -0.5% | Annuity | |

1. Option net return = option provided return [returns provided are: net of investment and admin fees].

2. An option is indexed when the percent of passive management is greater than or equal to 80%.

Investment options and average total return

Investment options

Your plan offered 11 investment options in 2021. This was below the universe median of 14.

Offering more investment options to participants is not necessarily better. When there are too many choices, the process can be overwhelming to participants.

What is important is that you offer a diverse line-up with varying risk-return profiles and costs.

Type and number of investment options - 2021

| Option category | Your plan | Average | Median |
|-------------------------------|-----------|-------------|-----------|
| Stock Employer Discretionary | 0 | 0.5 | 0 |
| Stock U.S. | 2 | 4.9 | 4 |
| Stock Non U.S. & Global | 2 | 2.4 | 2 |
| Bonds | 2 | 2.6 | 2 |
| Balanced | 0 | 0.5 | 0 |
| Target Date ¹ | 1 | 0.9 | 1 |
| Stable Value & GIC | 0 | 0.7 | 1 |
| Cash, Money Market | 1 | 0.6 | 1 |
| Mutual Fund Window | 0 | 0.1 | 0 |
| Participant Brokerage Account | 1 | 0.4 | 0 |
| Real, Hedge, Other ex. Loans | 2 | 0.8 | 0 |
| Total (excl. Loans) | 11 | 14.6 | 14 |

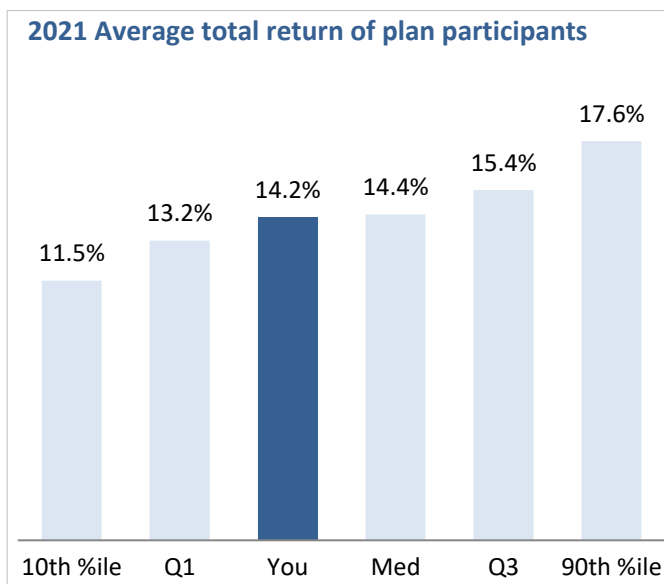
1. Target Date funds in one family are counted as one option.

Average total return of plan participants

Your plan participants' average net total return was 14.2% in 2021. This was below the U.S. universe median of 14.4%.

Average net total return measures the change in the average participant's account balance as a result of the net investment returns earned by their investment options weighted by their holdings.

There are two primary causes of differences in participants' average net total return: asset mix differences and value added performance. These are shown on the next page.



Asset mix and value added

Asset mix

As fiduciaries you should monitor asset mix because it is often the biggest reason for differences in the total returns of plan participants. Asset mix red-flags include high holdings of employer stock, cash, and stable value.

Asset mix is a function of the investment options offered and members' choices.

2021 Asset mix

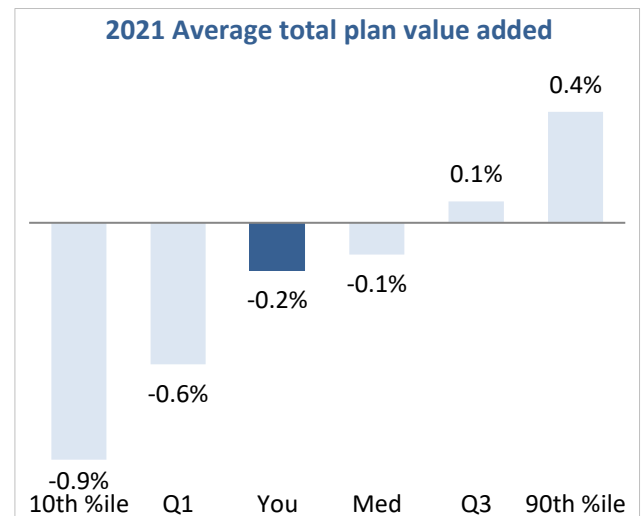
| Option category | Your | | |
|-------------------------|------|---------|--------|
| | plan | Average | Median |
| Stock Employer | 0% | 7% | 2% |
| Stock U.S. | 14% | 35% | 36% |
| Stock Non U.S. & Global | 18% | 7% | 6% |
| Bonds | 4% | 6% | 6% |
| Target Date & Balanced | 51% | 32% | 29% |
| Stable Value & GIC | 0% | 8% | 6% |
| Cash, Money Market | 2% | 2% | 0% |
| MF & Brokerage Windows | 1% | 3% | 1% |
| Real, Hedge, Other | 9% | 1% | 1% |
| Total | 100% | 100% | |

Average total plan value added

The weighted average net value added earned across all of your plan's options was -0.2% in 2021. This was below the U.S. universe median of -0.1%.

Positive value added indicates that, on average, your plan's investment options are outperforming their benchmark indices, whereas negative value added indicates that they are underperforming.

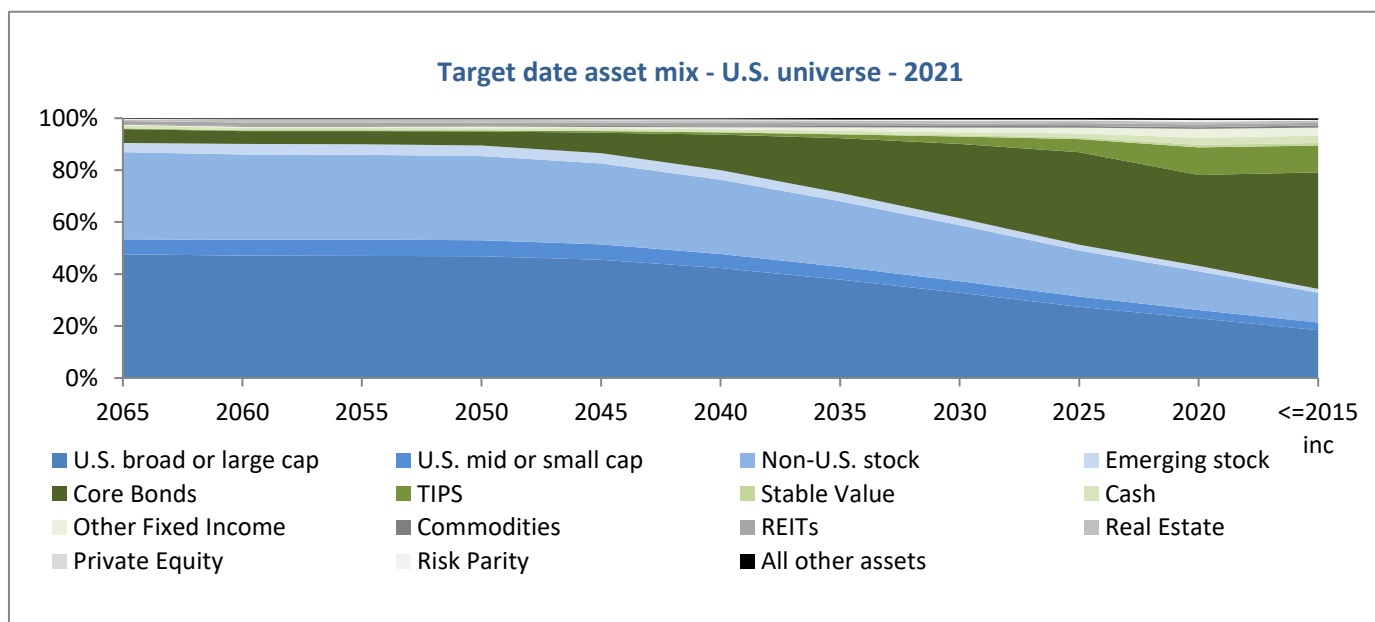
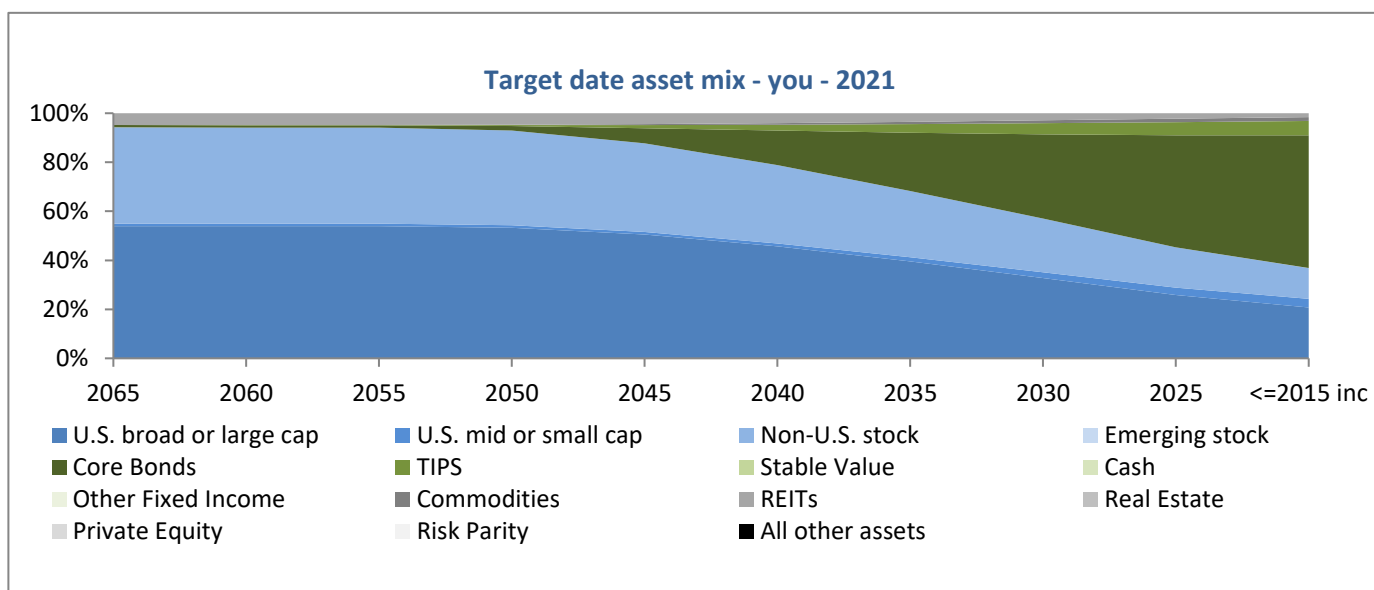
2021 Average total plan value added



Asset mix of target date funds

Target date asset mix

The first graph is your target date asset allocation glide path. The one below is the U.S. average plan's glide path. On the next page, data is shown as percentages. Your plan offers a target date family and it is your default option.



Asset mix of target date funds

Target date asset mix - you - 2021

| Asset class | 2065 | 2060 | 2055 | 2050 | 2045 | 2040 | 2035 | 2030 | 2025 | 2020 | <=2015 inc |
|-------------------------|------|------|------|------|------|------|------|------|------|------|---------------|
| U.S. broad or large cap | 54% | 54% | 54% | 53% | 51% | 46% | 40% | 33% | 26% | -- | 21% |
| U.S. mid or small cap | 1% | 1% | 1% | 1% | 1% | 1% | 2% | 2% | 3% | -- | 4% |
| Non-U.S. stock | 39% | 39% | 39% | 39% | 36% | 32% | 27% | 22% | 16% | -- | 13% |
| Emerging stock | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | -- | 0% |
| Core Bonds | 1% | 1% | 1% | 2% | 6% | 14% | 24% | 34% | 46% | -- | 54% |
| TIPS | 0% | 0% | 0% | 0% | 1% | 2% | 4% | 5% | 5% | -- | 6% |
| Stable Value | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | -- | 0% |
| Cash | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | -- | 0% |
| Other Fixed Income | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | -- | 0% |
| Commodities | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | -- | 2% |
| REITs | 5% | 5% | 5% | 5% | 4% | 4% | 3% | 3% | 2% | -- | 2% |
| Real Estate | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | -- | 0% |
| Private Equity | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | -- | 0% |
| Risk Parity | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | -- | 0% |
| All other assets | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | -- | 0% |

Target date asset mix - U.S. universe - 2021

| Asset class | 2065 | 2060 | 2055 | 2050 | 2045 | 2040 | 2035 | 2030 | 2025 | 2020 | <=2015 inc |
|-------------------------|------|------|------|------|------|------|------|------|------|------|---------------|
| U.S. broad or large cap | 48% | 47% | 47% | 47% | 45% | 42% | 38% | 33% | 27% | 23% | 18% |
| U.S. mid or small cap | 6% | 6% | 6% | 6% | 6% | 5% | 5% | 4% | 4% | 3% | 3% |
| Non-U.S. stock | 34% | 33% | 33% | 32% | 31% | 29% | 25% | 22% | 18% | 15% | 11% |
| Emerging stock | 3% | 4% | 4% | 4% | 4% | 4% | 3% | 3% | 2% | 2% | 1% |
| Core Bonds | 5% | 5% | 5% | 5% | 8% | 14% | 21% | 29% | 36% | 35% | 45% |
| TIPS | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 3% | 5% | 11% | 10% |
| Stable Value | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% |
| Cash | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 2% | 3% | 3% |
| Other Fixed Income | 0% | 1% | 0% | 1% | 1% | 1% | 1% | 2% | 2% | 3% | 3% |
| Commodities | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% |
| REITs | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| Real Estate | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| Private Equity | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Risk Parity | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| All other assets | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% |

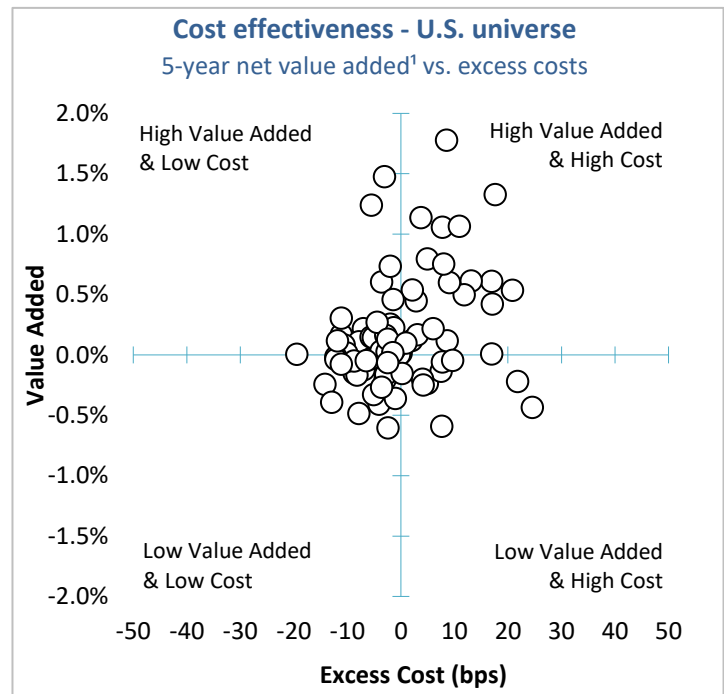
Cost effectiveness

Cost effectiveness ranking

In an ideal world, the more you pay (i.e., the larger your excess cost) the more you get (i.e., the higher your value added). If this were true, you would see an upward sloping relationship in this graph. Clearly, this is not the case. CEM's research has shown consistently that there is no relationship between what plans spend and what they received.

It is however good to know where your plan places on the graph and, even more important, to understand the reasons why.

This report provides you with high-level insights of how your plan compared to the U.S. universe in 2021. CEM's new interactive online Dashboard provides much more insight, through a cost-effective channel. We invite you to review for yourself with a limited time free trial access. See next page for details.



1. Value added = net return - benchmark return. Value added from employer stock is neutralized by setting its benchmark return equal to its actual return. It is neutralized in this report so we can show the value added from diversified plan options. Similarly, value added for stable value options is neutralized because of concerns over the benchmarks used for these options.

Request a free trial of your CEM Dashboard to experience the benefits of upgrading to our premium benchmarking service

What is CEM Dashboard?

Our new interactive benchmarking service offered through our secure on-line portal. CEM's high standard of benchmarking analysis is provided through a cost-effective channel. It allows all fiduciaries or plan sponsors of DC plans the opportunity to perform their fee and performance review to the high standards required of them, thereby reducing litigation risks.

CEM Dashboard will provide you with:

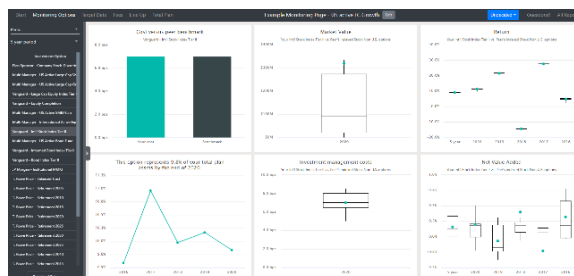
- A total plan benchmark cost using CEM's proprietary peer based analysis, which adjusts for all factors that impact fees. Peers are custom selected based on similarly sized plans, one of the factors that impacts fees. This analysis is superior to the total plan benchmark cost previously included in this PDF report.
- A benchmark cost for each investment option, as well as performance metrics, giving you the context and information you need to properly monitor your investment options. Universe based benchmarks (i.e. page 6 of this report) are inferior to peer-based, especially for outlier sized plans.
- Analysis of target date glide path and risk, and a benchmark cost estimate which adjusts for glide path and other fee drivers.
- Peer based analysis of recordkeeping, and other administrative and participant expenses (such as managed account fees).

You now have two upgrade options:

1. CEM Dashboard
2. BenchmarkDC, our comprehensive benchmarking report, which includes the Dashboard.

| | Dashboard | Comprehensive |
|--|-----------|---------------|
| Access to CEM Dashboard | ✓ | ✓ |
| CEM's proprietary peer based benchmark cost analysis | ✓ | ✓ |
| Comparisons against your choice of universe & peers | ✓ | ✓ |
| Comprehensive results and insights in an 80+ page PDF report | | ✓ |
| In-person meeting and presentation | | ✓ |
| Virtual access to CEM for research, questions and help | limited | unlimited |

To learn more click on the video below:



To request your 2-week trial contact:

Quentin Spehner
Quentin@cembenchmarking.com

Appendix: Your survey responses

Data quality

We recognize that the value of the information contained in these reports is only as good as the quality of the data we receive. Therefore, we work very hard at getting good data. Our procedures for checking and improving the data include:

- Improved Survey Clarity - 25 years of feedback from survey participants has led to improved definitions and survey clarity.
- Computer and Analyst Verification - We compare responses to norms for the survey universe and to each sponsor's prior year data when available. This typically results in questions that we send to each survey respondent and follow-up by email and/or phone.

In addition, the quality of our data continues to improve because of:

- Learning Curve - This is our 25th year of gathering this data and experience is teaching us and the participants how to do a better job.
- Growing Universe - As our universe of respondents continues to increase in size, so does our confidence in the results as unbiased errors tend to average themselves out. As a result of the above, data quality has improved dramatically over the twenty five year period we have been benchmarking. We feel there will always be room for improvement and we welcome any suggestions on how to further improve data quality.

Your survey responses

Your data is summarized on the following pages. As discussed with you (or the person who provided your plan's data) during the data confirmation process, your original survey responses may have changed for the following reasons:

- 1. Gross versus Net Returns** - We permit participants to report returns on either a net or gross basis. In order to ensure 'apples-to-apples' comparisons, we compare returns net of all costs, including administration costs.
- 2. Returns not available** - We request that you leave the return blank if a full year return was unavailable for an investment option. The default for an unavailable return is to exclude this investment option from the net value added calculations.
- 3. Costs not provided** - One of our key themes is that you must know your costs if you want to manage your plan effectively. We recognize, however, that some costs such as Fiduciary Oversight costs can be difficult to obtain. Therefore, if you were unable to provide us with your costs, or your best estimate of these costs, we imputed a figure using industry data.

Your survey responses

VA ORPHE – TIAA

| General | 2021 | 2020 | 2019 | 2018 | 2017 |
|--|----------------|---------------|------|------|------|
| Contact | Laura Pugliese | | | | |
| Data provided by: | Michael Scott | Michael Scott | | | |
| Corporate, public, other? | Public | Public | | | |
| Market value of plan assets (\$ millions) | \$357 | \$294 | | | |
| Number of plan participants | 5,215 | 5,147 | | | |
| % of eligible employees participating | 75% | 75% | | | |
| Are some DC participants covered by a DB plan? | No | No | | | |
| | None | None | | | |

| Administrative costs, plan expenses (\$000s) | 2021 | 2020 | 2019 | 2018 | 2017 |
|--|------|------|------|------|------|
| Recordkeeping ¹ | | | | | |
| paid from expense ratio of invest. options charged to individuals or participant accounts paid by plan sponsor | 363 | 378 | | | |
| Custodial & trustee | | | | | |
| paid from expense ratio of invest. options charged to individuals or participant accounts paid by plan sponsor | | | | | |
| Oversight internal ² | | | | | |
| paid from expense ratio of invest. options charged to individuals or participant accounts paid by plan sponsor | 180 | 235 | | | |
| Consulting | | | | | |
| paid from expense ratio of invest. options charged to individuals or participant accounts paid by plan sponsor | | | | | |
| Other | | | | | |
| paid from expense ratio of invest. options charged to individuals or participant accounts paid by plan sponsor | | | | | |
| less rebates to participants from reimburse. accounts | 53 | 42 | | | |
| Total Plan Expenses | 490 | 571 | | | |

| Participant Expenses (\$000s) | 2021 | 2020 | 2019 | 2018 | 2017 |
|--|------|------|------|------|------|
| Participant advice | | | | | |
| paid from expense ratio of invest. options charged to individuals or participant accounts paid by plan sponsor | | | | | |
| Managed account fees | | | | | |
| paid from expense ratio of invest. options charged to individuals or participant accounts paid by plan sponsor | | | | | |
| Other participant expenses (for loans, QDROs, etc.) | | | | | |
| paid from expense ratio of invest. options charged to individuals or participant accounts paid by plan sponsor | | | | | |
| Total Participant Expenses | | | | | |

1. If you were unable to provide a breakdown of your administrative & fiduciary costs, the total was included in recordkeeping because it usually represents the bulk of administrative & fiduciary costs.

2. If you were unable to provide costs for Fiduciary oversight internal, we applied a default value. If the number of internal FTEs is available, default equals \$100,000 x FTE. Otherwise, it is 0.0001 x Market value of plan assets.

Your survey responses

VA ORPHE – TIAA

| About your options | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---------------------------|---------------------------|------|------|------|
| Do you have a default investment option? | Yes | Yes | | | |
| If yes, what is the default option? | Target / lifecycle | Target / lifecycle | | | |
| Option returns are: | Net mgmt & admin fees | Net mgmt & admin fees | | | |
| Cost drivers and allocation | 2021 | 2020 | 2019 | 2018 | 2017 |
| FTE fulfilling fiduciary/oversight functions | 2.0 | 2.0 | | | |
| Does the plan offer a managed account service? | No | No | | | |
| Number with managed accounts | | | | | |
| Market value in managed accounts | | | | | |
| Do you receive revenue sharing from your providers? | No | No | | | |
| Is it used to reduce management fee? | | | | | |
| Is it used to reduce admin. or fiduciary costs? | | | | | |
| How are the recordkeeping or admin costs allocated to participants (asset based, flat fee, both, or other)? | flat fee | flat fee | | | |
| If other, describe | | | | | |
| Contributions | 2021 | 2020 | 2019 | 2018 | 2017 |
| Employer contributions (\$ millions) | 26 | 27 | | | |
| Participant contributions (\$ millions) | 6 | 6 | | | |
| % of participants making voluntary contributions? | | 0% | | | |
| Stable Value Funds | 2021 | 2020 | 2019 | 2018 | 2017 |
| What percentage of stable value assets are wrapped? | | | | | |
| What are your total wrap fees (in bps over wrapped amount) | | | | | |
| Loan features | 2021 | 2020 | 2019 | 2018 | 2017 |
| Does your plan allow loans? | No | No | | | |
| Total number of outstanding loans | | | | | |
| Average loan balance, (\$) | | | | | |
| Does your plan allow for hardship withdrawals | No | No | | | |
| Who pays the loan initiation fee? | | | | | |
| Is the fee a flat dollar amount or % of assets? | | | | | |
| Participant transaction rules and restrictions | 2021 | 2020 | 2019 | 2018 | 2017 |
| Limits on the number of transactions? | No | No | | | |
| Limits on international funds? | No | No | | | |
| Limits on any other funds (excl. international)? | | Yes | | | |
| Excessive trading penalties? | | No | | | |
| Describe other limits if any | 1) Transfers out the TIAA | 1) Transfers out the TIAA | | | |
| Assumed retirement age for your target date funds | 65 | 65 | | | |
| Do you customize or use an off shelf target date fund? | Off shelf | Off shelf | | | |
| Age at which target date retirement funds stop de-risking | 65 | 65 | | | |

Your survey responses

VA ORPHE – TIAA

| Services Offered to Separated Employees | 2021 | 2020 | 2019 | 2018 | 2017 |
|--|-------------|-------------|-------------|-------------|-------------|
| Lump sum payouts | Yes | Yes | | | |
| Required Minimum Distribution (RMD) payouts | Yes | Yes | | | |
| Partial payouts | Yes | Yes | | | |
| Installment payouts (e.g., monthly, quarterly, etc.) | Yes | Yes | | | |
| Loan initiation | No | No | | | |
| Loan maintenance (for loans made prior to separation) | No | No | | | |
| Online advice service | No | No | | | |
| Managed account advice service | No | No | | | |
| One-on-one advice service with an advisor | No | No | | | |
| Annuity platform (whether in-plan or out-of-plan) | Yes | Yes | | | |
| Employee contributions (DC is primary, no DB) | 2021 | 2020 | 2019 | 2018 | 2017 |
| Can participants make: | | | | | |
| a. After-tax Roth 401(k) contributions? | No | No | | | |
| b. After-tax non-Roth 401(k) contributions? | No | No | | | |
| Is investment in employer stock required to some extent? | No | No | | | |
| Is there a mandatory fixed or minimum contribution rate for full-time employees? | Yes | Yes | | | |
| If yes, what is the mandatory contribution rate as a % of salary ? | 5.0% | 5.0% | | | |
| Does the plan have automatic enrolment? | No | No | | | |
| If yes: | | | | | |
| a. Initial automatic contribution as a % of salary | | | | | |
| b. What (if any) is the automatic annual increase in the contribution rate? | | | | | |
| c. Maximum rate achieved via automatic increases? | | | | | |
| Applied to all/new employees only when introduced? | No | No | | | |
| Employee contributions (DC is suppl. to DB) | 2021 | 2020 | 2019 | 2018 | 2017 |
| Can participants make: | | | | | |
| a. After-tax Roth 401(k) contributions? | | | | | |
| b. After-tax non-Roth 401(k) contributions? | | | | | |
| Is investment in employer stock required to some extent? | | | | | |
| Is there a mandatory fixed or minimum contribution rate for full-time employees? | | | | | |
| If yes, what is the mandatory contribution rate as a % of salary ? | | | | | |
| Does the plan have automatic enrolment? | | | | | |
| If yes: | | | | | |
| a. Initial automatic contribution as a % of salary | | | | | |
| b. What (if any) is the automatic annual increase in the contribution rate? | | | | | |
| c. Maximum rate achieved via automatic increases? | | | | | |
| Applied to all employees or new only when introduced? | | | | | |

Your survey responses

VA ORPHE – TIAA

| Employer contributions (if DC is primary, no DB) | 2021 | 2020 | 2019 | 2018 | 2017 |
|--|-------------|-------------|-------------|-------------|-------------|
| Are employer contributions made in employer stock, cash or both? | Cash | Cash | | | |
| Is there a profit sharing component to employer contributions? | No | No | | | |
| Is there an automatic fixed employer contribution rate? | Yes | Yes | | | |
| If yes, what is the automatic fixed employer contribution rate? | 8.5% | 8.5% | | | |
| Is there an after-tax employer match? | No | No | | | |
| Is there a before-tax employer match? | No | No | | | |
| % of participants earning the maximum match | | | | | |
| Indicate the match terms below: | | | | | |
| Percentage match on the first: | | | | | |
| Percentage of salary contributed: | | | | | |
| Percentage on the next: | | | | | |
| Percentage of salary contributed: | | | | | |
| Or describe: | | | | | |

| Employer contributions (if DC is suppl. to DB) | 2021 | 2020 | 2019 | 2018 | 2017 |
|--|-------------|-------------|-------------|-------------|-------------|
| Are employer contributions made in employer stock, cash or both? | | | | | |
| Is there a profit sharing component to employer contributions? | | | | | |
| Is there an automatic fixed employer contribution rate? | | | | | |
| If yes, what is the automatic fixed employer contribution rate? | | | | | |
| Is there an after-tax employer match? | | | | | |
| Is there a before-tax employer match? | | | | | |
| % of participants earning the maximum match | | | | | |
| Indicate the match terms below: | | | | | |
| Percentage match on the first: | | | | | |
| Percentage of salary contributed: | | | | | |
| Percentage on the next: | | | | | |
| Percentage of salary contributed: | | | | | |
| Or describe: | | | | | |

Your survey responses

VA ORPHE – TIAA

| Fiduciary | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|-------------|-------------|-------------|-------------|-------------|
| Named fiduciary? | Board | Board | | | |
| If named fiduciary is a committee: | | | | | |
| Number of committee members? | | | | | |
| Number of meetings in the past year? | | | | | |
| Are the meeting minutes documented? | | | | | |
| Are the named fiduciaries: | | | | | |
| Provided formal training? | Yes | Yes | | | |
| Required to sign an acknowledgement form? | Yes | Yes | | | |
| Have third parties been appointed as: | | | | | |
| • Investment manager with full discretionary powers for selecting, monitoring, replacing investment options? | No | No | | | |
| • Investment advisor to provide advice regarding the selection and retention of investment options? | No | No | | | |
| • Plan administrator responsible for regulatory filings, disclosures to participants and hiring plan service providers if no other fiduciary has that responsibility? | Yes | Yes | | | |
| Is there documentation that identifies the process for: | | | | | |
| • Selection and monitoring of third-party fiduciaries and other plan service providers? | Yes | Yes | | | |
| • Investment policy | Yes | Yes | | | |
| • Oversight of internal employees involved in operating the plan (i.e., internal fiduciaries, HR staff enrolling employees in the plan, posting deferrals, etc) | Yes | Yes | | | |
| • Fulfilling administration responsibilities (regulatory filings, disclosures to participants) | Yes | Yes | | | |
| Education and other | 2021 | 2020 | 2019 | 2018 | 2017 |
| Is individual investment counseling/advice offered to plan participants? | No | No | | | |
| • Is it provided by advisor, computer, both? | | | | | |
| Does your plan offer financial education via: | | | | | |
| • Group meetings? | Yes | Yes | | | |
| • One-on-one meetings? | Yes | Yes | | | |
| Do plan participants receive projections of annual income in retirement: | | | | | |
| • In their participant statements? | Yes | Yes | | | |
| • Online? | Yes | Yes | | | |
| • Via separate communication? | No | No | | | |
| Does your plan have marketing campaigns to: | | | | | |
| • Increase employee contribution/deferral rates? | Yes | No | | | |
| • Increase participation by eligible non-participants? | Yes | No | | | |
| • Educate on the savers tax credit for lower income participants? | Yes | No | | | |
| • Improve diversification from Employer Stock? | No | No | | | |
| Does your plan offer: | | | | | |
| • Out-of-plan guaranteed lifetime income product? | No | No | | | |
| • In-plan guaranteed lifetime income product? | Yes | Yes | | | |
| Does your plan offer automatic rebalancing? | Yes | Yes | | | |

Your survey responses

VA ORPHE – TIAA

Your plan's 2021 investment options

| Provider & Option name | Type | % Inxd | \$ mils at 12/31/21 | Annual | | Benchmark | Cost | | |
|---|----------------------------|--------|---------------------|--------|--|-----------|---------------|---------------|----------------|
| | | | | Return | Description | | Return | Invest | Admin |
| BlackRock - BlackRock Equity Index Fund J | Stk U.S. Broad or LC | 100% | 40 | 28.7% | S&P 500 | 28.7% | 1.0 bp | 0.0 bp | 1.0 bp |
| BlackRock - BlackRock Russell 2500 Index Fund M | Stk U.S. SMID Cap | 100% | 10 | 18.2% | Russell 2500 | 18.2% | 4.0 bp | 0.0 bp | 4.0 bp |
| BlackRock - BlackRock MSCI ACWI IMI Index Non-Lendable Fund M | Stk Global | 100% | 48 | 18.3% | MSCI ACWI IMI Index | 18.2% | 5.0 bp | 0.0 bp | 5.0 bp |
| BlackRock - BlackRock MSCI ACWI ex-U.S. IMI Index Fund M | Stk Non U.S. | 100% | 18 | 8.6% | MSCI ACWI ex-U.S. IMI Index | 8.5% | 11.0 bp | 0.0 bp | 11.0 bp |
| BlackRock - BlackRock U.S. Debt Index Fund M | Bonds Broad | 100% | 9 | -1.6% | Bloomberg Barclays U.S. Aggregate Bond I | -1.5% | 3.0 bp | 0.0 bp | 3.0 bp |
| BlackRock - BlackRock U.S. TIPS Fund M | Bonds TIPS | 100% | 5 | 5.9% | Bloomberg Barclays U.S. TIPS Index | 6.0% | 3.0 bp | 0.0 bp | 3.0 bp |
| BlackRock - BlackRock Short-Term Investment Fund W | Cash, Money Mrkt | 0% | 6 | 0.2% | Your Cash, Money Market benchmark | 0.1% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - BlackRock LifePath Index Retirement O | Target Date Short | 98% | 29 | 7.0% | Custom Benchmark | 7.0% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - BlackRock LifePath Index 2025 Fund O | Target Date Short | 99% | 23 | 9.1% | Custom Benchmark | 9.1% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - BlackRock LifePath Index 2030 Fund O | Target Date Medium | 99% | 32 | 11.4% | Custom Benchmark | 11.5% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - BlackRock LifePath Index 2035 | Target Date Medium | 99% | 25 | 13.8% | Custom Benchmark | 13.9% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - BlackRock LifePath Index 2040 Fund O | Target Date Long | 99% | 28 | 16.0% | Custom Benchmark | 16.0% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - BlackRock LifePath Index 2045 Fund O | Target Date Long | 100% | 24 | 17.7% | Custom Benchmark | 17.7% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - BlackRock LifePath Index 2050 Fund O | Target Date Very Long | 100% | 14 | 18.7% | Custom Benchmark | 18.6% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - BlackRock LifePath Index 2055 Index Fund O | Target Date Very Long | 100% | 6 | 18.8% | Custom Benchmark | 18.8% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - BlackRock LifePath Index 2060 Index Fund O | Target Date Very Long | 100% | 1 | 18.8% | Custom Benchmark | 18.8% | 8.0 bp | 0.0 bp | 8.0 bp |
| BlackRock - BlackRock LifePath Index 2065 Fund O | Target Date Very Long | 100% | 1 | 18.8% | Custom Benchmark | 18.8% | 8.0 bp | 0.0 bp | 8.0 bp |
| TIAA Real Estate Account - Real Estate Fund | Real Estate | 0% | 11 | 17.9% | Custom Composite Index | 18.9% | 63.0 bp | 24.0 bp | 87.0 bp |
| TIAA Traditional Annuity RC - Traditional Annuity Fund | Annuity | 0% | 23 | | Neutralized | | 30.0 bp | 15.0 bp | 45.0 bp |
| TIAA-CREF Self Directed Account - Participant Brokerage Account | Participant Broker Account | 0% | 5 | | | | 0.0 bp | 0.0 bp | 0.0 bp |
| Total | | | 357 | | | | 9.5 bp | 1.6 bp | 11.2 bp |