Annual Pension Report Data

Funding Health

Overview

Below is the national funding status over time, based on our sample of 228 public pension plans. Among these, 121 are state administered plans and 107 are local plans.

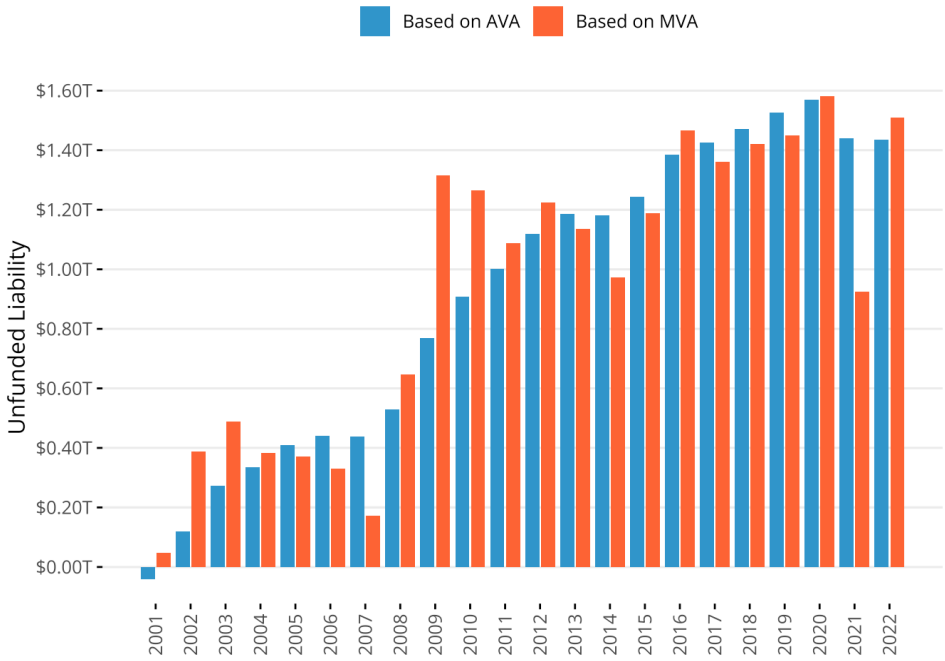


Figure 1: National Unfunded Liability Over Time

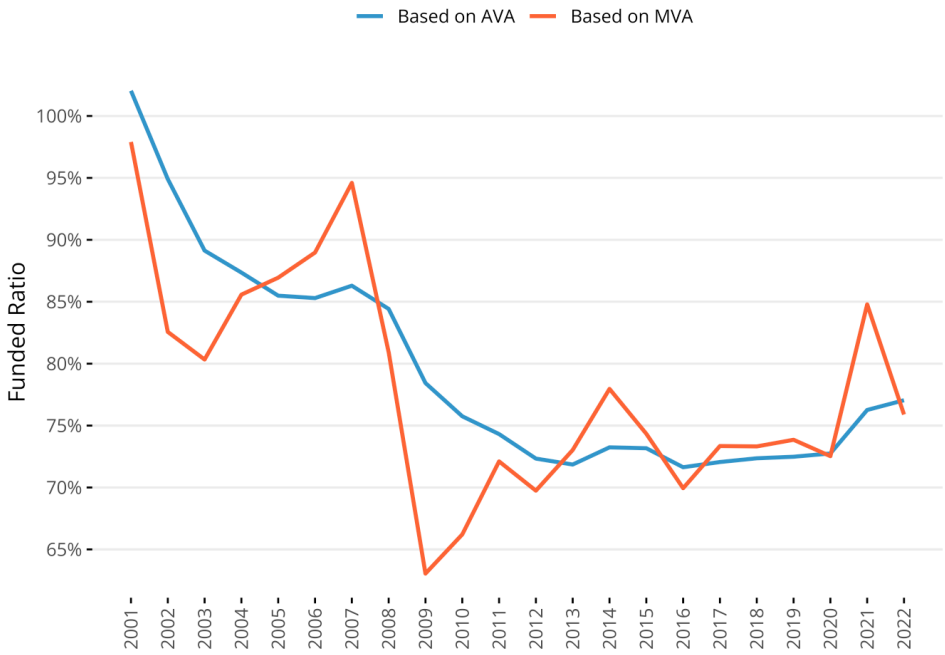


Figure 2: National Funded Ratio Over Time

Let's break down the MVA-based UAL to see how the pension debt is divided among state and local plans over time:

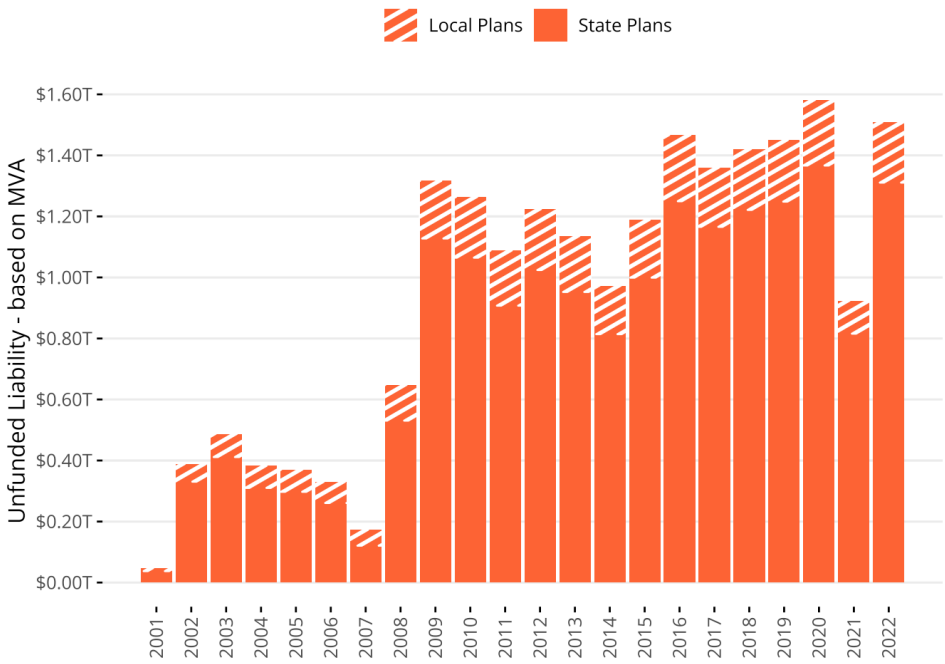


Figure 3: National Unfunded Liability Breakdown

Distribution of Funding Status

Here's how the funding ratio distribution moved over the last 20 years

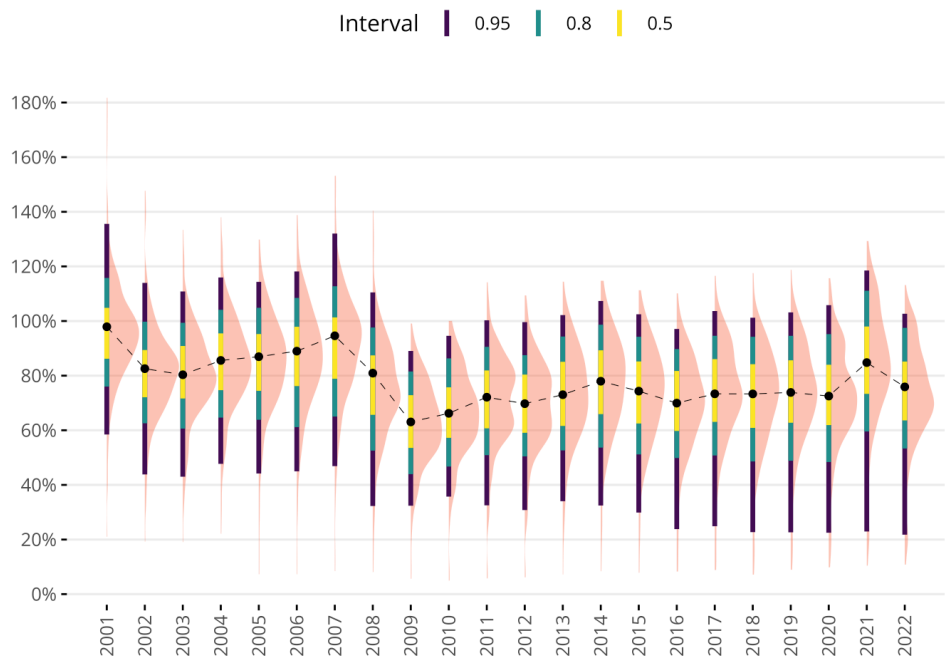


Figure 4: Distribution of Funded Ratios Over Time

Now, let's zoom in 2022 and see the funded ratio distribution:

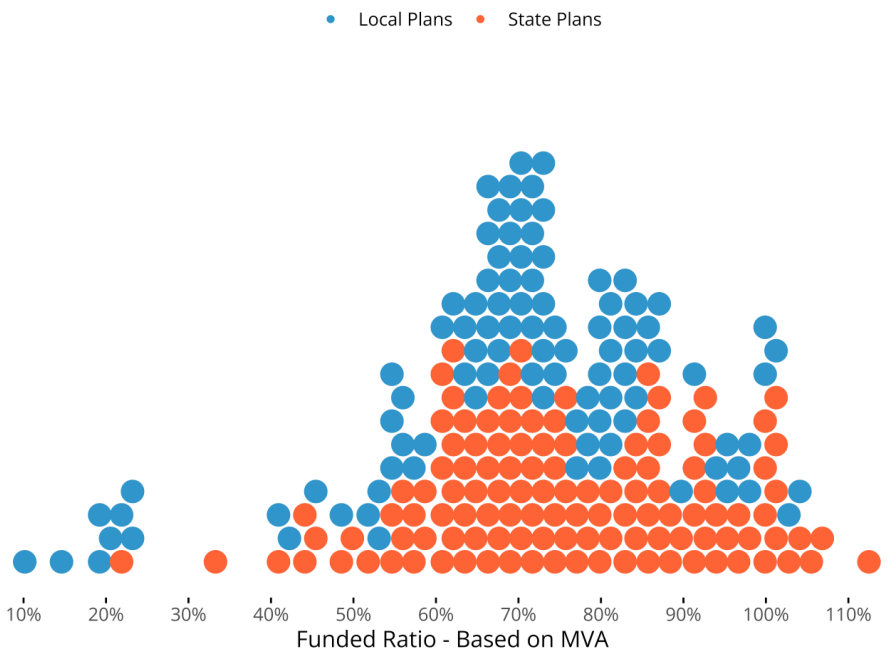


Figure 5: Funded Ratio Distribution - 2022

Ranking Plans Based on Funding Status

The interactive table below shows all the pension plans in our sample from the best funded plans to the worst funded ones in FY2022. You can sort

the table based on any column and search for any specific plan.

Year	Plan	Type	AAL	MVA ↓	Funded Ratio
2022	Washington LEOFF Plan 2	State Plans	$17.34B	$19.62B	113%
2022	Washington PERS 2/3	State Plans	$55.25B	$58.85B	107%
2022	NY State & Local ERS	State Plans	$219.30B	$232.05B	106%
2022	Houston Firefighters	Local Plans	$4.88B	$5.09B	104%
2022	DC Police & Fire	Local Plans	$6.64B	$6.90B	104%
2022	Oklahoma Police	State Plans	$2.93B	$3.01B	103%
2022	Missouri Local	State Plans	$9.92B	$10.18B	103%
2022	Nashville-Davidson ERS	Local Plans	$3.99B	$4.05B	102%
2022	NY State & Local Police & Fire	State Plans	$41.08B	$41.67B	101%
2022	Washington School Employees Plan 2/3	State Plans	$8.71B	$8.75B	100%

1–10 of 216 rows Previous **1** 2 3 4 5 ... 22 Next

Replicate the tables for state plans only / local plans only

State Level

On the aggregate level for state pension, the best funded state is Washington with a funded ratio of 106%, and the worst funded state is New Jersey with a funded ratio of 47%. The median state is Ohio with a funded ratio of 75%.

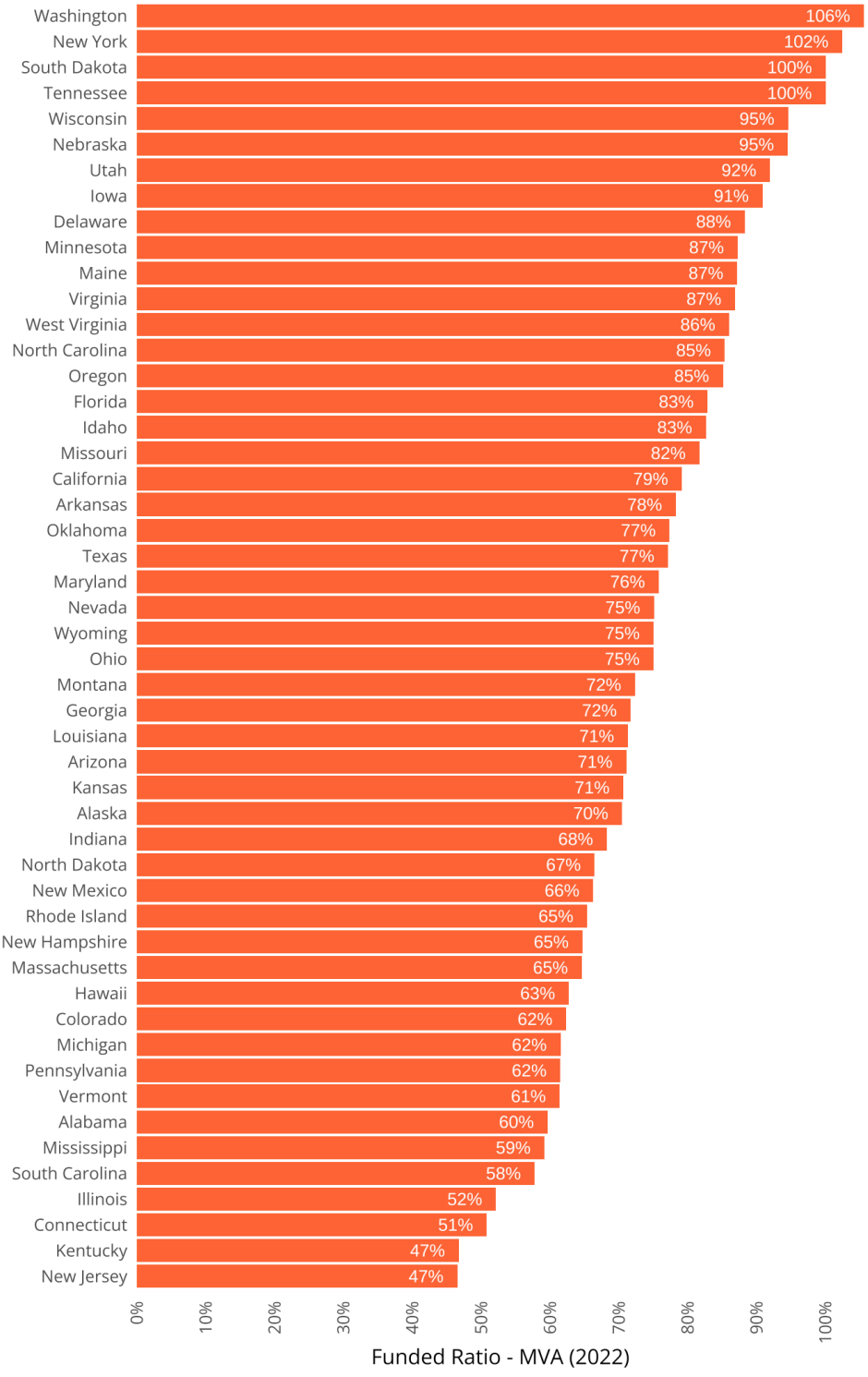


Figure 6: State Funded Ratio - 2022

A variable width bar chart (with the width of the bar chart representing the size of each state's accrued liability) could be a great visualization to show states' funding status and their relative sizes simultaneously (Jen)

Investment Performance

Overview

First, let's look at the annual returns at the aggregate/national level.

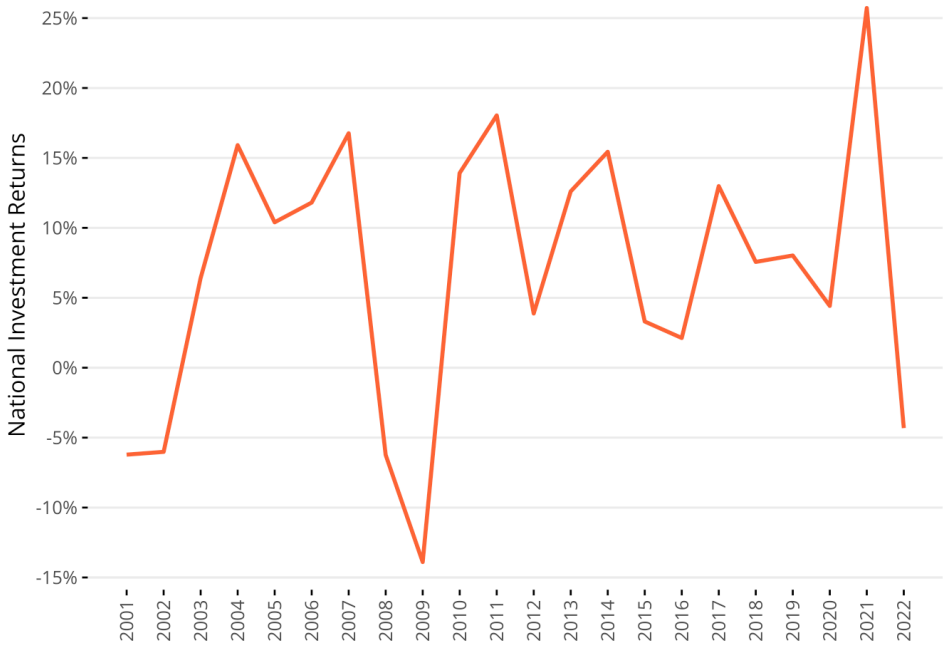


Figure 7: National Public Pension Returns

In 2022, public pension plans in our sample earned an aggregate return of -4.32%.

Investment Performance and FY End Months

One issue with calculating aggregate returns like this is not all plans have the same fiscal year ends. Figure 8 shows that most plans concentrate around June and December, with a small number of plans end their fiscal years in March, April, August, and September.

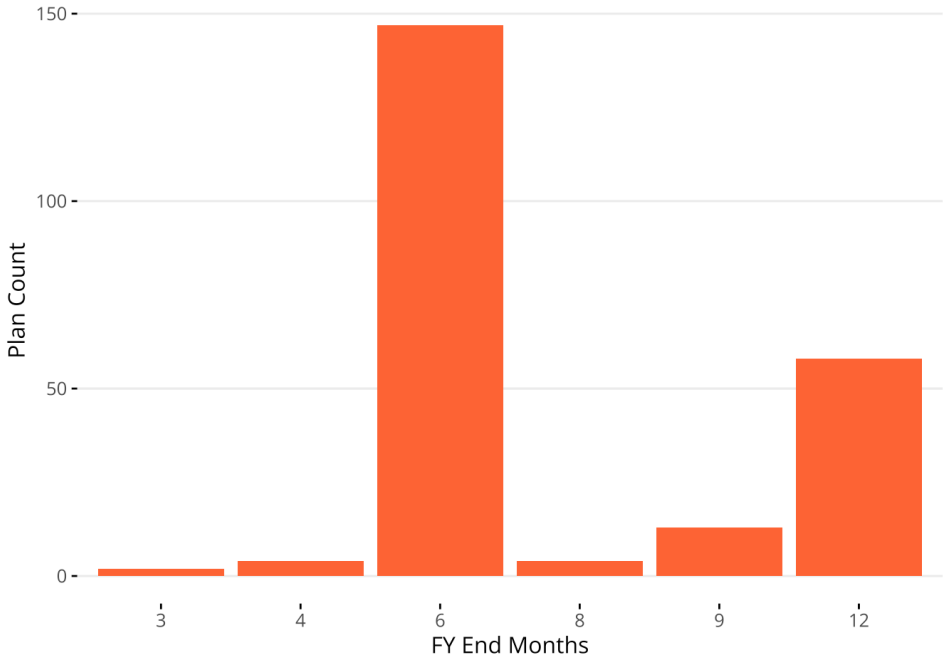


Figure 8: Distribution of Public Plans Based on Fiscal Year End Months

Figure 9 visualizes the aggregate pension returns by fiscal year end months. You can see that the return differences among these groups can be significant.

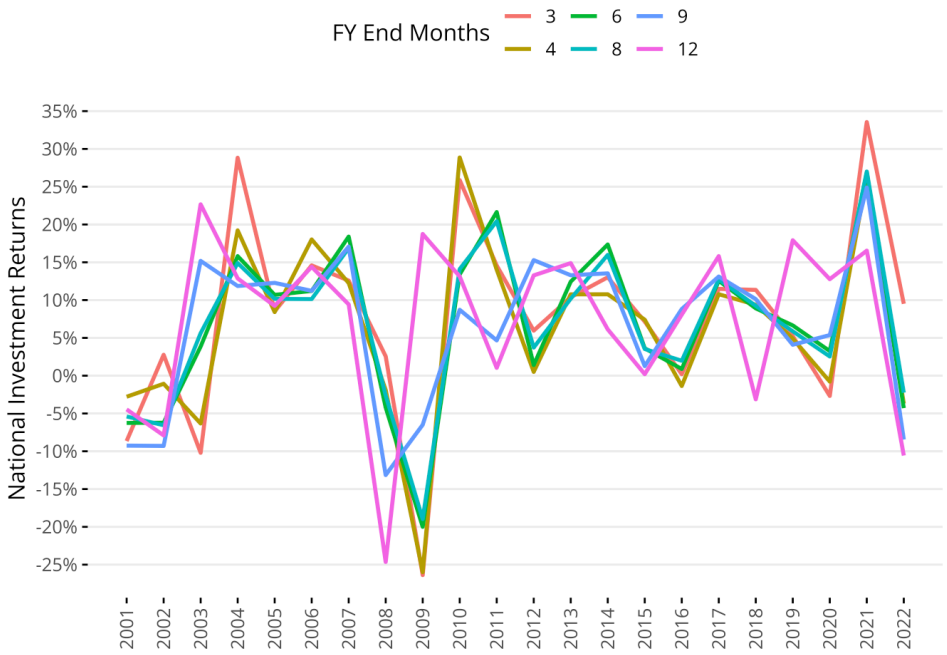


Figure 9: National Public Pension Returns By FY End Months

Let's zoom in 2022 and see how plans' returns differed because of FY end months.

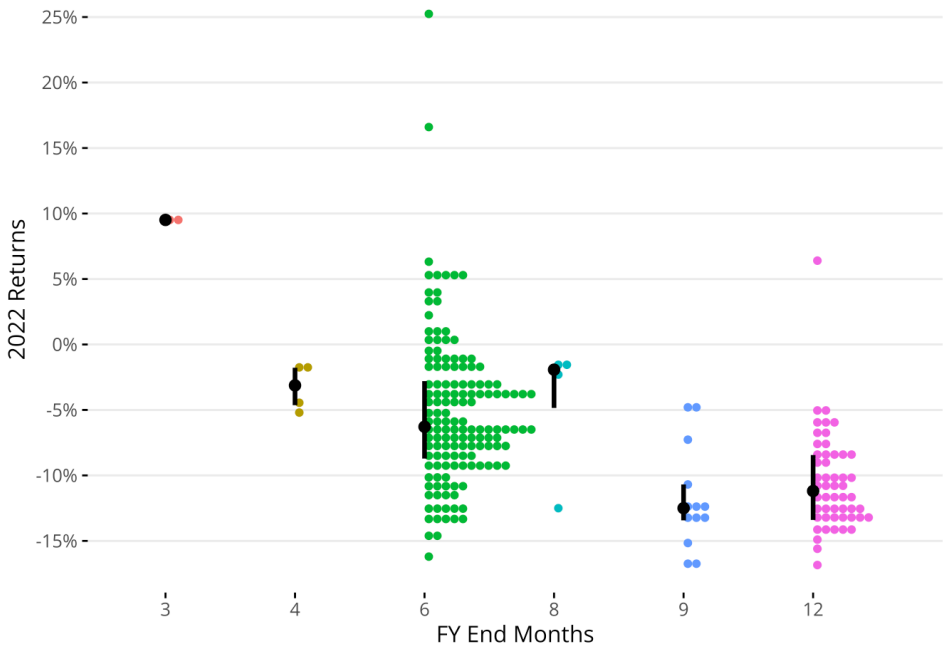


Figure 10: Public Pension Returns Distribution By FY End Months

The differences in one year are indeed significant. However, if we look at the average returns over the last 22 years, do FY end months matter?

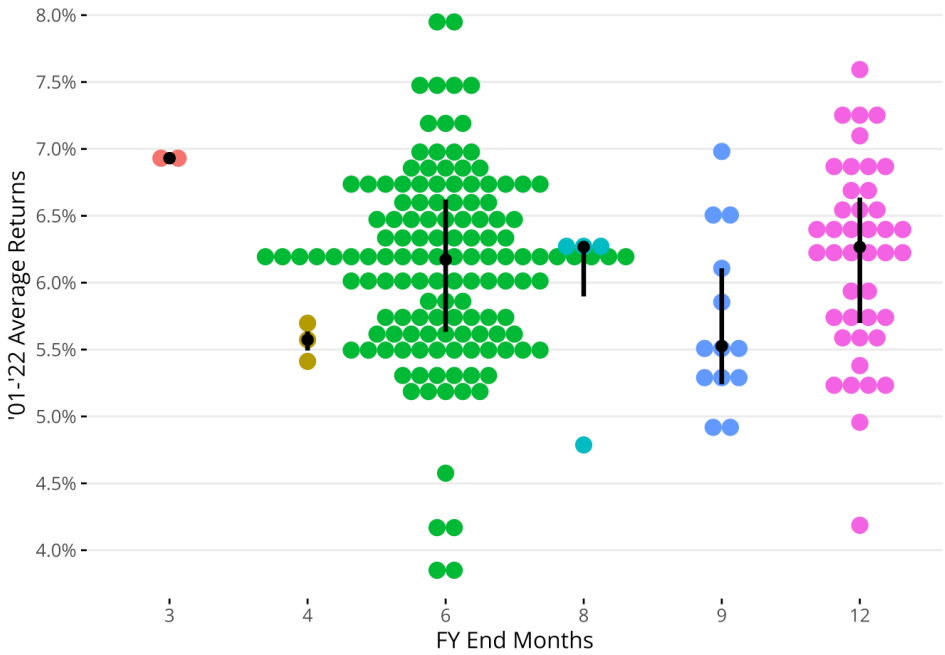


Figure 11: Public Pension Average Returns (22-Year) Distribution By FY End Months

Investment Performance and Assumed Rates of Returns

Let's compare the 22-year average returns with the average assumed rates of return over the same period:

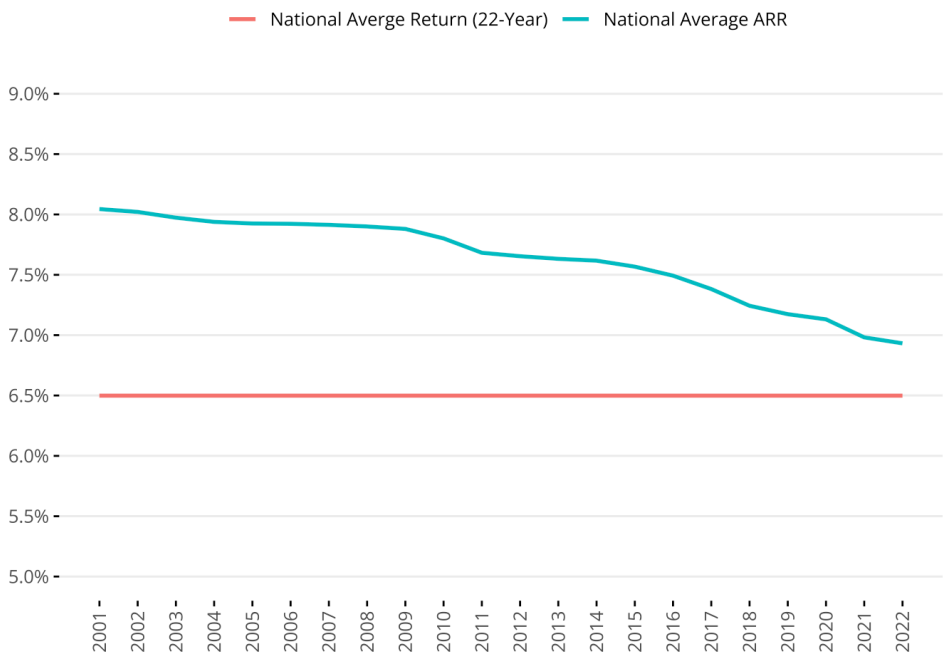


Figure 12: National Average Return (22-Year) vs. National Average ARR

Let's compare the ARR against not just the 22-year average return but also rolling 5-year, 10-year, and 15-year returns.

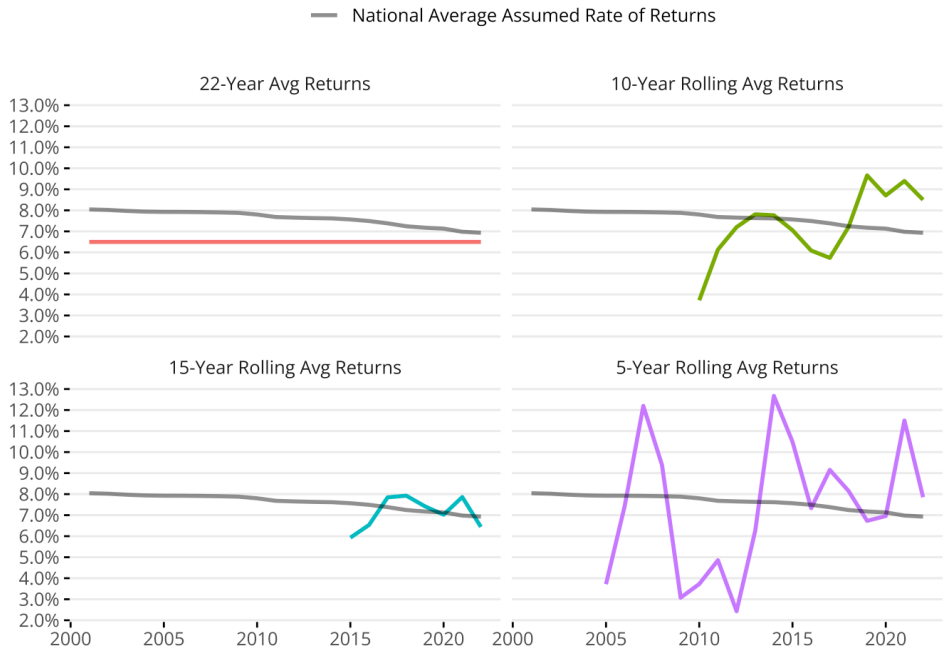


Figure 13: National Rolling Average Returns vs. National Average ARR

How about the distribution of plans' ARRs vs plans' average returns over

How about the distribution of plans' ARRs vs plans' average returns over the last 22 years?

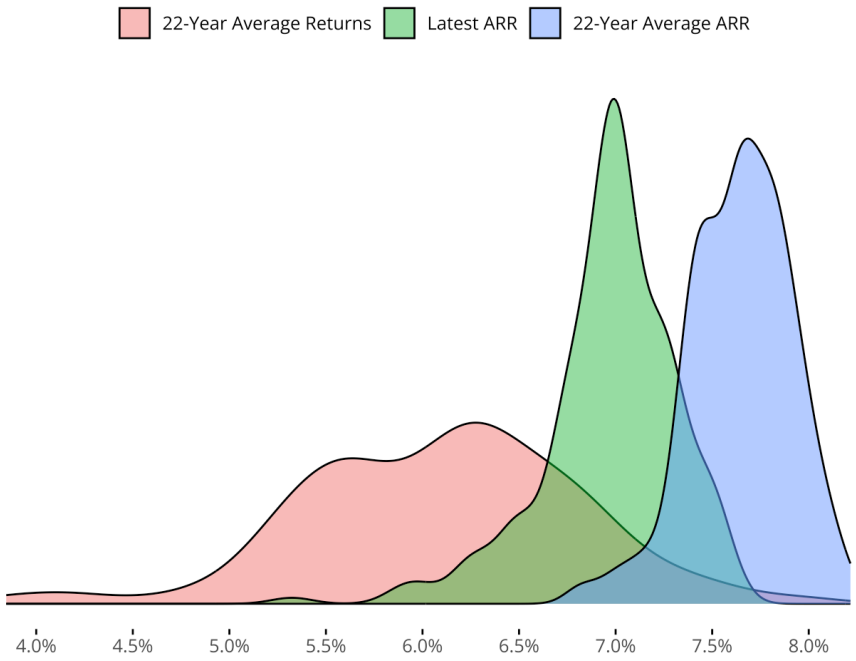


Figure 14: Average Returns (22-Year) Distribution vs. ARR Distribution

How about adding the average returns over the last 15, 10, and 5 years to the mix?

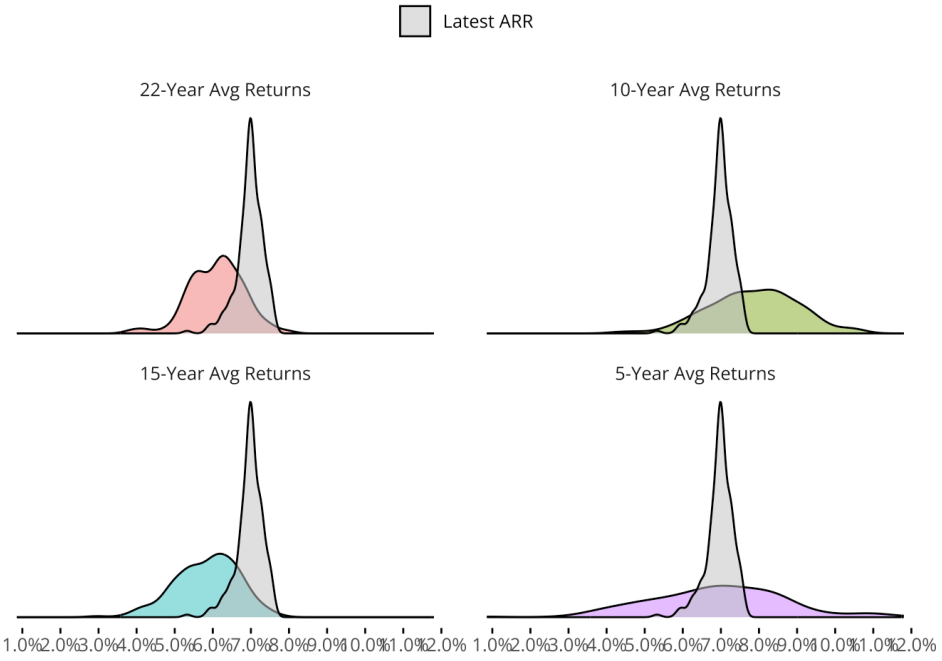


Figure 15: Average Returns Distribution (Varying Periods) vs. ARR Distribution

Now, let's show the distribution of "Excess returns". Excess returns here are defined as the differences between the plans' actual average returns

are defined as the difference between the plans' actual average returns and their ARRs.

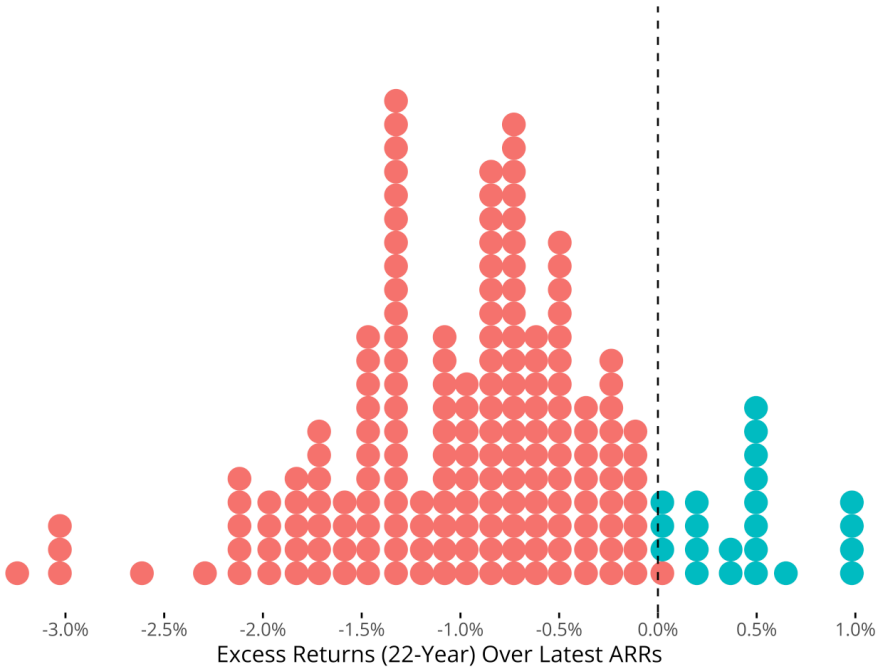


Figure 16: Excess Returns (22-Year) Distribution

Figure 16 shows that 88.9% of the public pension plans failed to beat their latest ARRs over the last 22 years.

Investment Performance Benchmarking

First, let's see how public pension funds performed compared to the popular S&P500.

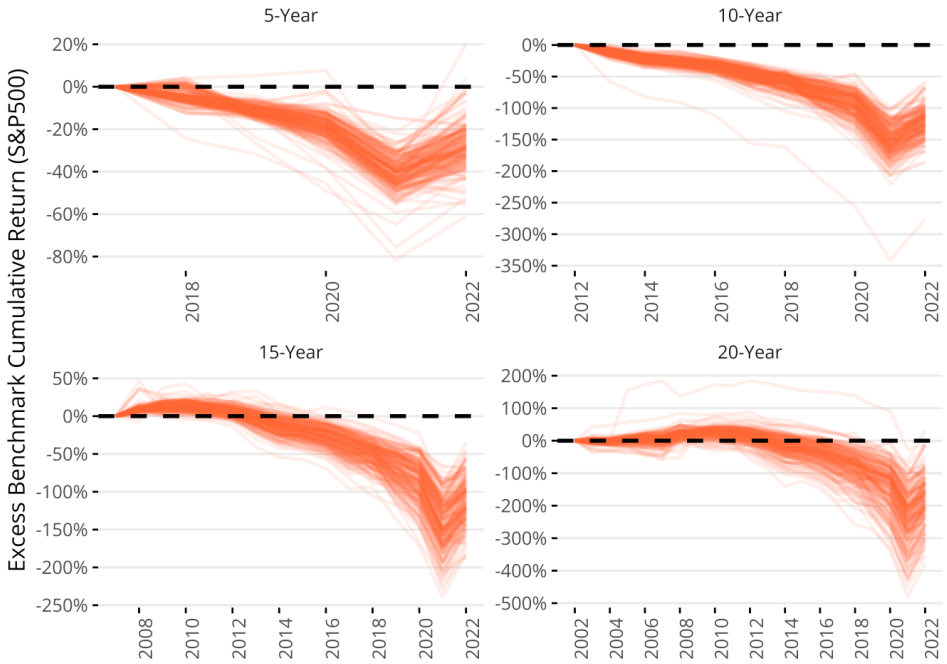


Figure 17: Investment Return Benchmarking (S&P500)

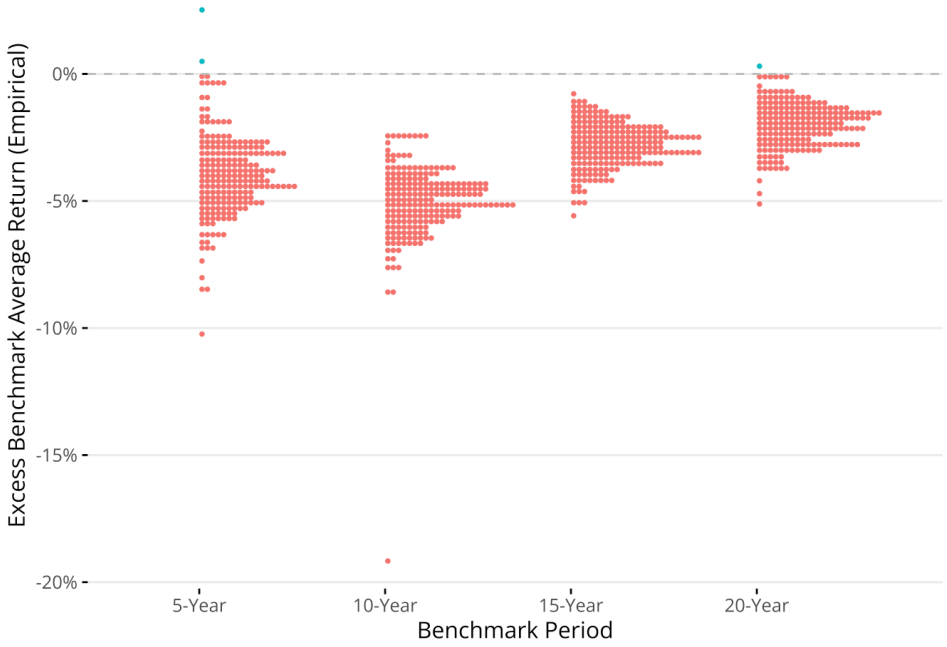


Figure 18: Investment Return Benchmarking (S&P500)

The S&P500 may not be the appropriate benchmark for all plans. Below is a more appropriate benchmarking method that takes into account the risk & return profile of each pension fund.

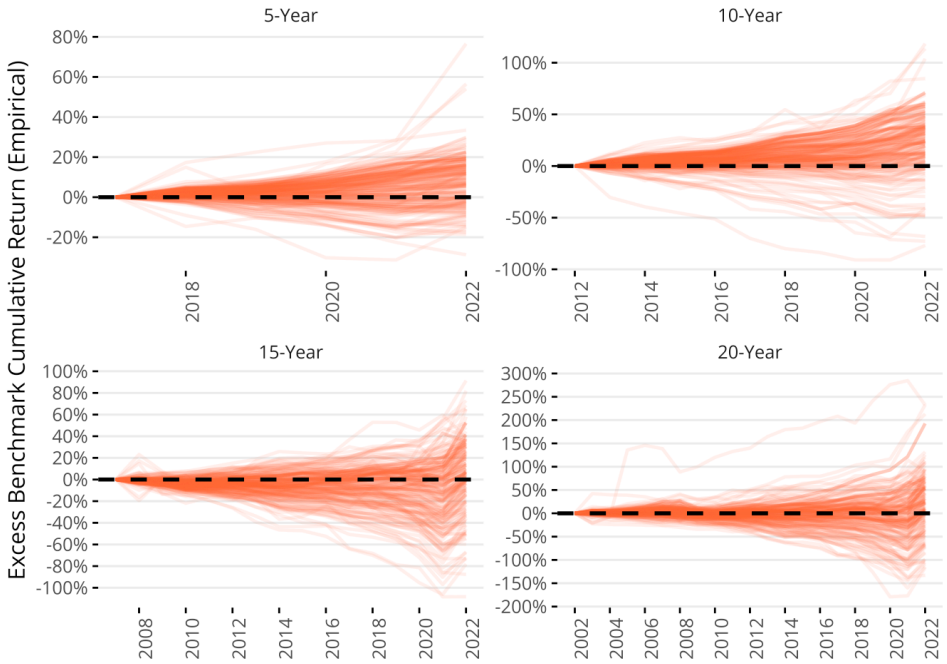


Figure 19: Investment Return Benchmarking (Empirical)

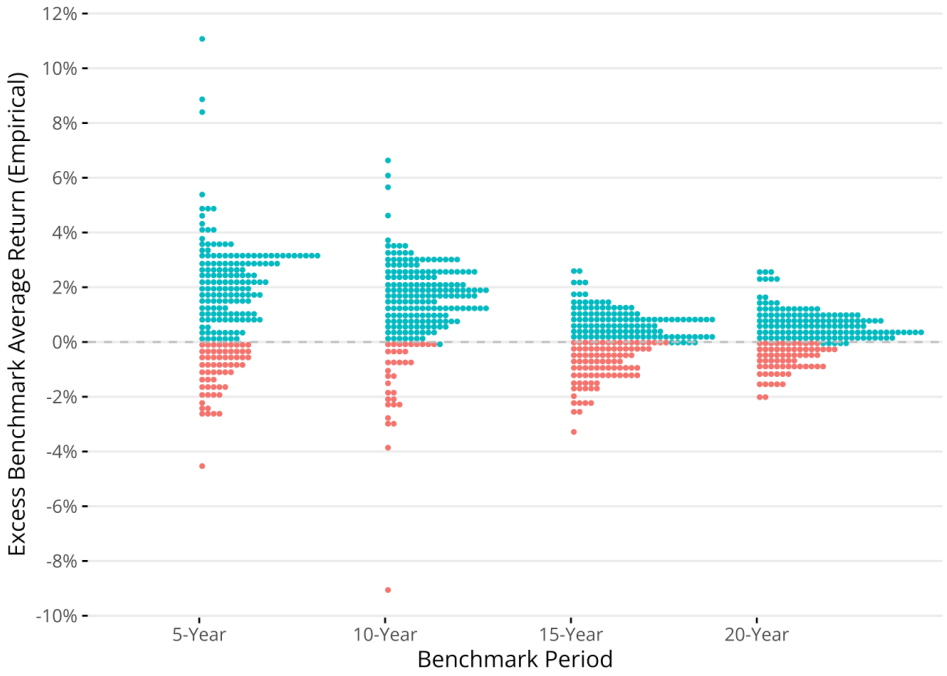


Figure 20: Investment Return Benchmarking (Empirical)

Ranking Plan Investment Performance

The interactive table below shows all the pension plans in our sample from the best performing plans to the worst performing ones in terms of average returns over the last 22 years. You can sort the table based on

any column and search for any specific plan.

Plan	Type	AAL	MVA	Funded Ratio	Latest ARR	2022 Return
Houston Firefighters	Local Plans	$4.88B	$5.09B	104%	7.00%	0.10%
Houston Municipal	Local Plans	$5.43B	$3.95B	73%	7.00%	5.20%
Bismarck Employees' Pension Plan	Local Plans	$0.14B	$0.12B	83%	7.25%	-10.10%
Washington Teachers Plan 2/3	State Plans	$23.20B	$23.15B	100%	7.00%	5.39%
Washington School Employees Plan 2/3	State Plans	$8.71B	$8.75B	100%	7.00%	5.39%
Washington PERS 2/3	State Plans	$55.25B	$58.85B	107%	7.00%	5.39%
Washington LEOFF Plan 2	State Plans	$17.34B	$19.62B	113%	7.00%	5.39%
Texas County & District	State Plans	$46.19B	$41.97B	91%	7.50%	-5.80%
Sioux Falls Fire	Local Plans	$0.20B	$0.19B	94%	7.30%	-13.99%
Missouri Local	State Plans	$9.92B	$10.18B	103%	7.00%	0.60%

1–10 of 199 rows Previous **1** 2 3 4 5 ... 20 Next

Investment Performance Analysis

Is there a correlation between public pension investment performance in terms of excess returns and funded ratios? Figure 21 shows this relationship.

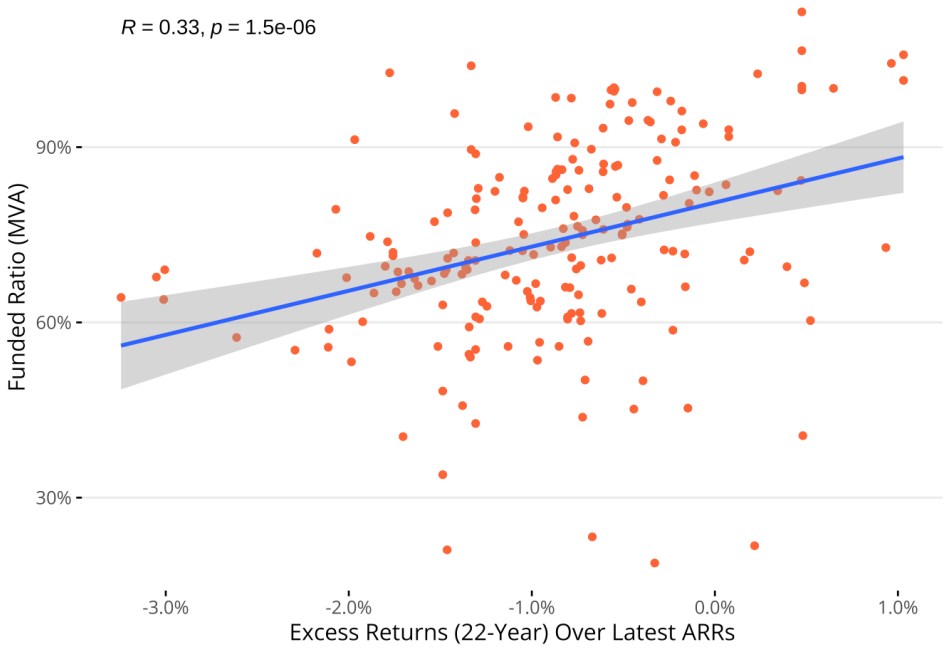
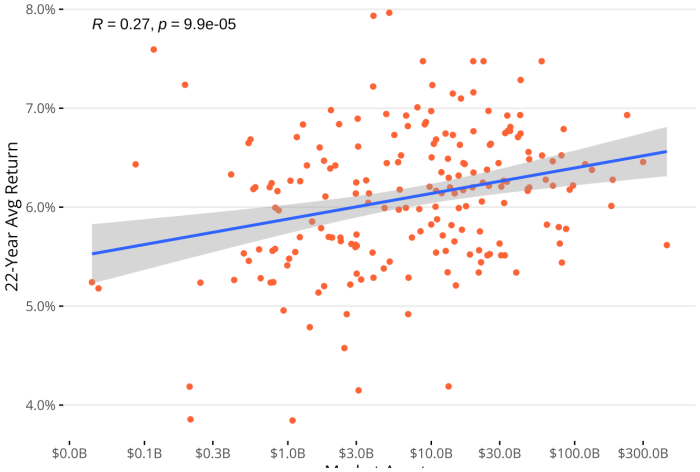
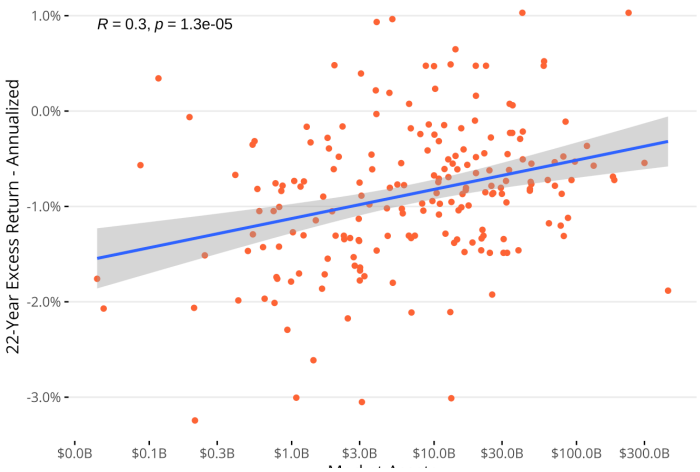


Figure 21: Correlation Between Excess Returns and Funded Ratios

The correlation is statistically significant, though it's not particularly strong (0.33).

Is there a relationship between plan sizes and investment performance?





Market Assets

Figure 22: Correlation Between Plan Size and Average Returns

Market Assets

Figure 23: Correlation Between Plan Size and Average Excess Returns

Asset Allocation

Overview

How did the aggregate asset allocation change over time?

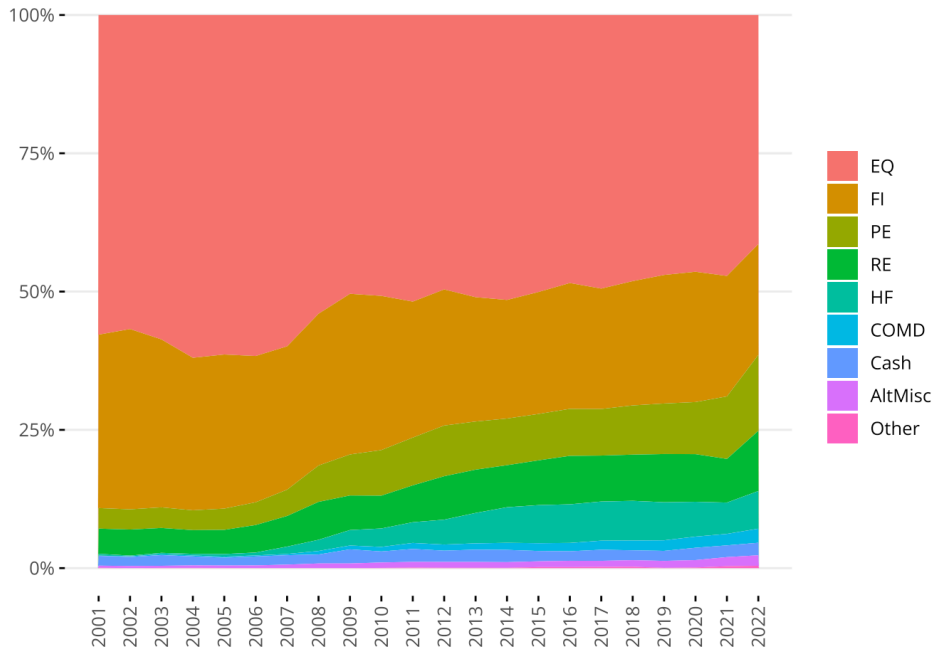


Figure 24: Public Pension Aggregate Asset Allocation

How did the aggregate asset class dollar amounts change over time?

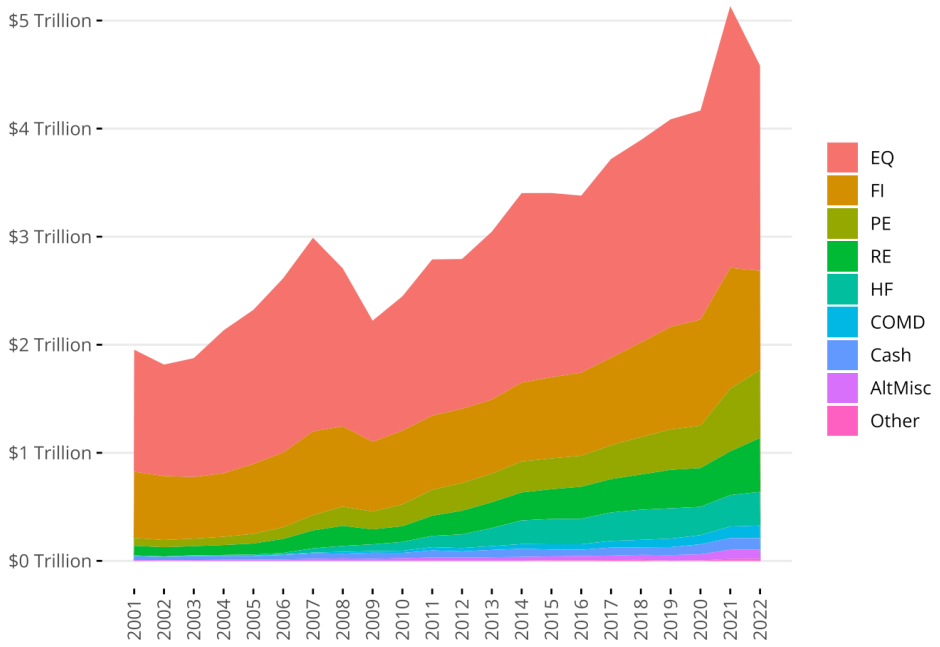


Figure 25: Public Pension Aggregate Asset Allocation (in $ amounts)

Visualize asset allocation over time (Thuy):

- Normal area chart
- Sankey chart for the asset allocation percentages
- Sankey chart for the asset allocation amounts
-

Top 10 funds with largest percentage of alternative investments as part of their portfolio

Show returns by asset class

Let's look into individual plans' investment performance vs. ARR and return benchmarks:

- SP500 (and some other popular indexes)
- Empirical benchmarks that we came up with

Percentage of funds with no/negative Alpha (investment returns lower than public market) — perhaps over the past decade to put past two years of good returns into context

Plan performance by plan size –> do bigger plans perform better than smaller plans?

Plan performance by quantile?

Plan Funded Status after DR adjustment (use 6%?)

Maybe look into the median rate as the rate to use for the adjustment?

Incorporate forecast tool

Top & bottom 10-25 plans in terms of unfunded liability per capita (maybe just state plans only?)

Top & bottom 10-25 plans in terms of unfunded liability per member?