

The original research was  
conducted by

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## Retirement Plan Performance Measures

The data consisted of four categories of retirement plans of various sizes based on their market values, \$1 million to \$10 million, \$10-100 million, \$100-500 million, and over \$500 million. Of the 6,125 plans included in the original data sample, 295 plans were excluded from the analysis due to missing values in returns of the funds and/or their associated benchmarks. The final sample size for the analysis was 5,830.

- Table 1 reports the number of the total population and the sample of each fund size category in 2017.
- Table 2 reports the mean ratio of funds in plans that outperformed their benchmark.
- Table 3 reports the percentage of plans in each size category that outperformed their benchmark.

This report employs a fund-level approach and a plan-level approach to evaluate the plan's performance. The performance measures used in the analysis at both the fund level and the plan level included expected return, standard deviation, Sharpe ratio, downside risk, and Sortino ratio.

## Summary of Results

### Plan Performance at the Fund Level

Table 2 reports the mean (average) ratio of funds in plans that outperformed their benchmark.

The average of funds in plans that outperformed their benchmark was calculated by dividing the number of outperforming funds by the total number of funds in the lineup for each plan and taking an average of these ratios for all plans and for plans in each size category.

Evaluated by the expected return, the overall average percent of funds in a plan that outperformed its benchmark was 63.78%. In general, the average of plans with outperforming funds in a plan was higher in larger market value plans. The only exception was plans with market value of \$500 million or more, where only 60.75% of the funds in a plan outperformed their corresponding benchmark, the lowest of all four size categories. Meanwhile, 66.56% of funds in the \$100-500 million category outperformed their benchmark, the highest among all four categories.

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**Plan Performance at the Plan Level**

Table 3 reports the percentage of plans that outperformed their corresponding benchmark plan in 2017 at the plan level.

To calculate at the plan level, an equal weight is assigned to each fund offered in its retirement plan. The benchmark for each retirement plan consists of the benchmark of each fund in that plan. Funds in each benchmark plan received their weight in the same manner. Performance measures are then calculated for both the retirement plan portfolio and its benchmark plan portfolio.

On average, the percentage of plans that achieved a higher expected return than their benchmark was 82.66%. Generally, the percentage of plans that outperformed their benchmark plan as measured by expected return was higher for plans with a larger market value. The only exception was the largest plans with a market value of \$500 million or more. An average of 82.50% of these plans outperformed their benchmark, lower than the 90.53% of the \$100-500 million size category and the 85.71% of the \$10-100 million size category.

## Table 1

*Number of Defined Contribution Plans and Sample Weights in 2017*

Plan Size	2017
<b>\$1m-\$10m</b>	
Population	38,290
Sample weights	1,241 0.51295458
<b>\$10m-\$100m</b>	
Population	34,010
Sample weights	1,658 0.34102595
<b>\$100m-\$500m</b>	
Population	8,407
Sample weights	1,817 0.07692216
<b>\$500m+</b>	
Population	4,630
Sample weights	1,114 0.06909731
<b>Total</b>	
Population	85,337
Sample	5,830

## Table 2

*Mean Ratio of Funds in Plans that Outperformed Their Benchmark*

Plan Size	2017
	<b>Panel A: Higher Expected Returns</b>
<b>Overall</b>	63.78
\$1-10m	62.36
\$10-100m	65.10
\$100-500m	66.56
\$500m+	60.75
	<b>Panel B: Lower Risk (Standard Deviation)</b>
<b>Overall</b>	44.53
\$1-10m	43.67
\$10-100m	44.29
\$100-500m	47.83
\$500m+	47.46
	<b>Panel C: Higher Sharpe Ratio</b>
<b>Overall</b>	58.15
\$1-10m	56.64
\$10-100m	59.73
\$100-500m	61.12
\$500m+	53.63
	<b>Panel D: Lower Downside Risk</b>
<b>Overall</b>	58.74
\$1-10m	57.38
\$10-100m	60.32
\$100-500m	61.11
\$500m+	53.99
	<b>Panel E: Higher Sortino Ratio</b>
<b>Overall</b>	59.63
\$1-10m	58.51
\$10-100m	61.03
\$100-500m	61.84
\$500m+	54.77

Note. n=5,830, numbers in percentages.

## Table 3

*Percentages of Plans that Outperformed Their Benchmark*

Plan Size	2017
	<b>Panel A: Higher Expected Returns</b>
<b>Overall</b>	82.66
\$1-10m	78.24
\$10-100m	85.71
\$100-500m	90.53
\$500m+	82.50
	<b>Panel B: Lower Risk (Standard Deviation)</b>
<b>Overall</b>	59.94
\$1-10m	58.26
\$10-100m	60.31
\$100-500m	67.20
\$500m+	57.99
	<b>Panel C: Higher Sharpe Ratio</b>
<b>Overall</b>	82.22
\$1-10m	78.08
\$10-100m	84.92
\$100-500m	90.37
\$500m+	81.87
	<b>Panel D: Lower Downside Risk</b>
<b>Overall</b>	68.63
\$1-10m	61.72
\$10-100m	73.46
\$100-500m	80.85
\$500m+	68.04
	<b>Panel E: Higher Sortino Ratio</b>
<b>Overall</b>	78.55
\$1-10m	72.20
\$10-100m	82.69
\$100-500m	89.32
\$500m+	81.15

Note. n=5,830, numbers in percentages.