

2021 Investment Management Fee Study



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Executive Summary

Overview and Purpose

Callan's *2021 Investment Management Fee Study*, our ninth examination of what institutional investors pay for asset management, provides a detailed analysis on fee levels and trends across multiple asset classes and mandate sizes, for both active and passive management.

The analysis gives insight into what our institutional investor clients are actually paying (negotiated fees) versus the managers' published fee schedules.

Features

Actual vs. Published Fee Analysis: Compares by mandate size ranges the published fees of the broad product universe, published fees for just those products with client mandates, and the actual fees being paid for those client mandates.

Vintage Analysis: Compares current actual fees for more recently inception mandates (2016 and after) with those of older mandates (2015 and before) to better measure fee trends over the long term.

Concentration Analysis: Examines the concentration of AUM, mandates, and actual fees/revenues by investment firm for each asset class.

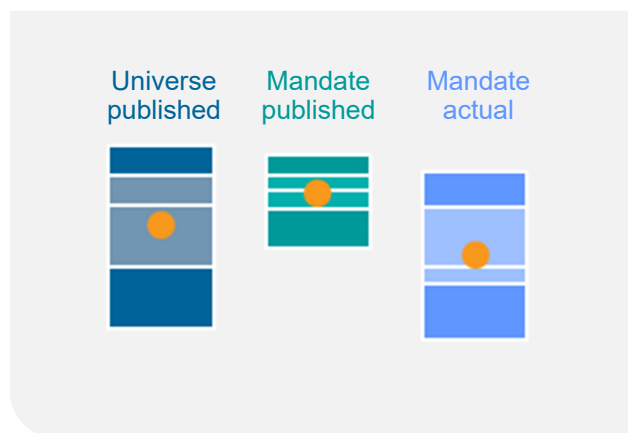
Asset Classes: Covers a total of 21 different asset classes.

Vehicles: Covers many institutional mandate vehicle types including separate accounts, many types of commingled funds (including collective investment trusts), and various partnership types. Mutual funds are excluded from this study.

Fee Data: In addition to fees paid in basis points, we capture the average discount from the published fee schedules. We also analyze average mandate sizes and average fees paid in dollars to gain insights into the health of the industry.

Data and Methodology

Data Sources and Types



The detailed data supporting this report were collected and curated using Callan’s proprietary investment manager database, actual client fee schedules, and Callan’s proprietary client performance reporting database.

The actual fee dataset for each client mandate was derived from client fee schedules and our client performance reporting database and represents fees paid for 2020. The resulting raw dataset was then reviewed for completeness and accuracy. The final clean dataset was then categorized by parameters such as active/passive, asset class, account size, inception date, and investment manager product. Unique mandate size ranges for analyzing each asset class were determined, balancing practical relevance with sufficient sample sizes. Throughout the study these actual client fees are labeled as “*mandate actual*” data.

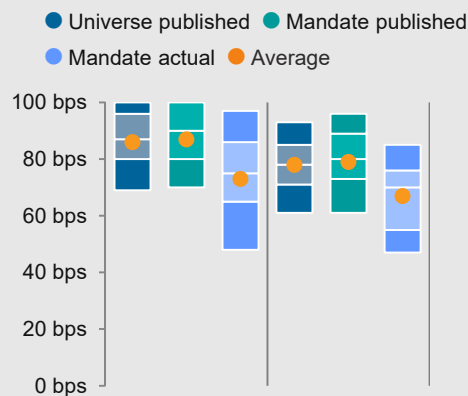
All published investment product fees come from Callan’s database of investment manager products. By cross-referencing the manager products and mandate sizes in the *actual* fee dataset with the “published” or “standard” fee schedules for those products, we calculated the theoretical published fee (non-negotiated) for those same mandates. These theoretical client fees are labeled as “*mandate published*” data. This more focused view of published fees is very useful as it represents the starting fee ranges for successfully competitive products, as well as helping crystallize actual negotiated discounts when compared to actual fees (mandate published - mandate actual).

In order to provide a broader view of the competitive fee landscape we also include the range of published fees for all products in the relevant asset class universe (regardless of having any client mandates). This range of published fees is labeled as “*universe published*”. Comparing this broader universe of published fees with the successful mandate published fees can be useful in determining what levels of published fees are competitive.

Data and Methodology

Actual vs. Published Fee Analysis

Fees by account size



	< \$50mm			\$50 to \$150mm		
10th percentile	100	100	97	93	96	85
25th percentile	96	100	86	85	89	76
Median	87	90	75	78	80	70
75th percentile	80	80	65	71	73	55
90th percentile	69	70	48	61	61	47
Average ●	86	87	73	78	79	67
Average Discount	14 bps			12 bps		

This analysis done on each asset class is meant to show current industry fees from three perspectives: 1) standard “published” fees from the broad universe of all competing products, 2) published fees (pre-negotiation) for only the subset of those products that have Callan client mandates, and 3) actual fees paid (after negotiation) for those client mandates. The goal is to illustrate and compare the fees for the total competitive landscape, the fees for those products successfully winning mandates from Callan clients, and the actual fees those clients ended up paying in 2020.

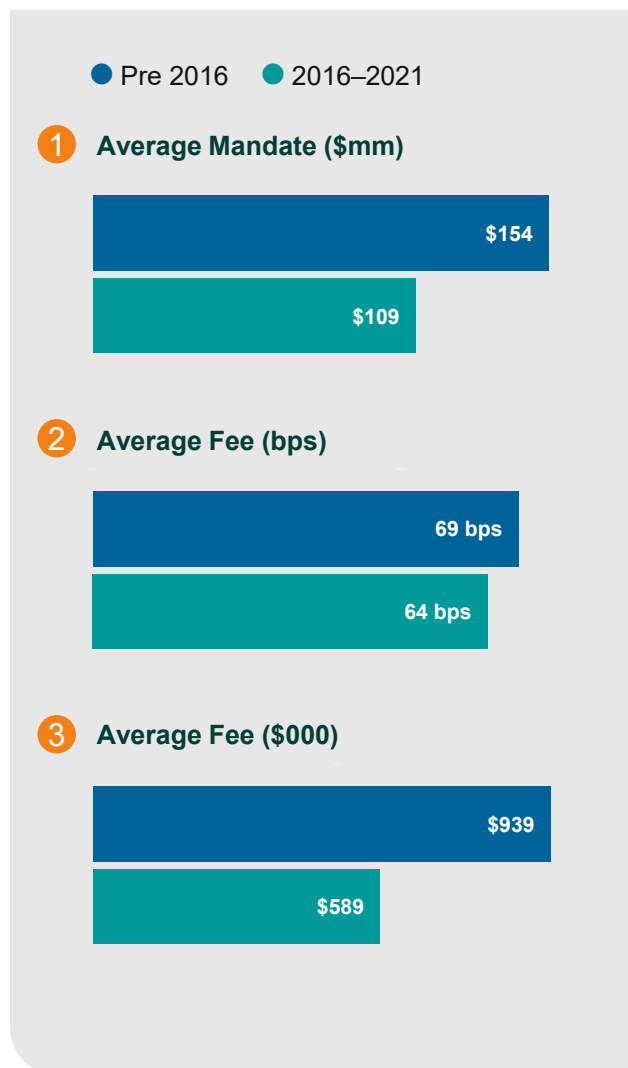
The analysis groups the mandates by asset size and so illustrates the change in effective fees as mandate size grows. In selecting the size ranges for each asset class, we took into account available sample sizes of client mandates, the usefulness of the breakpoints, and the number of ranges. In asset classes where sample sizes were too small we only report on the total asset class.

For each mandate size range there are three distributions shown: *universe published*, *mandate published*, and *mandate actual* respectively (see chart to left). These three distributions can differ significantly. The reasons for differences between *universe published* and *mandate published* can include: 1) client-specific fee criteria for the search (getting screened out on fees before having the chance to negotiate), 2) hiring tendencies of clients (e.g., choosing lower fee products vs. good performers), 3) differences in actual and published fee database participants, 4) institutional demand and product availability. The reasons for differences between *mandate published* and *mandate actual* can include: 1) negotiation of an actual fee below the published fee schedule as part of the hiring process, 2) relationship pricing when a client uses multiple manager products, 3) stale published fee schedules, 4) client tendencies to periodically renegotiate fees on existing mandates.

The Average Discount is also shown for each mandate size range. It is the difference between the average mandate published fee and the average mandate actual fee.

Data and Methodology

Vintage Fee Analysis



The Vintage Fee Analysis dives deeper into actual client mandate fees to illustrate the changes in the fee environment over the long term (>20 years). In order to better display these changes in investment management economics, the analysis focuses on not just changes in average actual fees in basis points (% of AUM), but also changes in average mandate sizes and the resulting changes in average dollar fees per client mandate. Looking at fees in both basis points and actual dollars per client gives a clearer picture of how sustained downward pressure on both fee schedules and mandate sizes results in significantly lower dollar fees paid (manager revenue) per client. Showing results in dollars is more illuminating in cases where the average fee in basis points appears stable, but the average mandate size declines materially, resulting in a lower average dollar fee.

The Vintage Fee Analysis looks only at current actual client fees, and groups client mandates into two vintages by mandate inception (hiring) date: 1) older pre-2016 inceptions, and 2) newer 2016 and after. The vintage groups are further broken down into mandate size ranges. For each vintage and mandate size group we calculate:

- 1 average mandate size in dollars
- 2 weighted average fee in basis points, and
- 3 average fee per mandate (client) in dollars.

Although we use inception vintage groups to differentiate industry fee dynamics over time based on when a mandate fee was negotiated, it is important to note that the **fees being used are the current fees, not necessarily what they were at inception** (original fees are not reliably available). Since some clients do periodically renegotiate fees with their managers, it is likely that some of the mandates in the older vintage had higher fees at inception. This means our analysis probably understates fees in the earlier vintage and therefore also understates the downward change in fees since 2016.

Data and Methodology

Concentration Analysis

\$34.5 billion in assets and **\$206.9 million** in fees

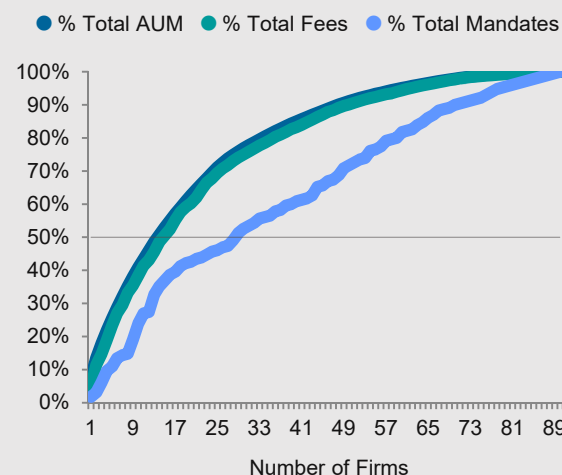
240 mandates with **90** different firms

- ▶ 50% of assets managed by 14 firms (16%)
- ▶ 50% of fees made by 15 firms (17%)
- ▶ 50% of mandates run by 29 firms (32%)

Active management has **73% AUM** market share in this segment (27% AUM passive)

Active management has **98%** fee market share in this segment (2% fees passive)

Concentration by Firm



Concentration Analysis is done on the actual client fee dataset both at an industry level (active and passive) as well as asset class by asset class to provide insights into how the competitive pie is being allocated across investment firms by our clients. The results illustrate the number of mandates in each area as well as how many different firms manage those mandates. Concentration of market share in each area with respect to percent of mandates, percent of total AUM, and percent of total fees is highlighted by showing how many firms control at least 50% of each. Where relevant we also determine the market share of active vs. passive in an asset class.

We are tracking the investment manager for every client mandate in the fee database, along with the mandate AUM and fee (in basis points and dollars). Therefore we can group mandates by investment management firm and generate useful results on manager market share and concentration across our clients in each asset class and in total.

Key Findings

Callan's 2021 *Investment Management Fee Study* reflects trends on 2020 fees representing \$598 billion in assets under management and \$1.4 billion in total fees paid. Our fee database includes mandates run by over 300 investment firms for over 160 institutional investors.

Fee resilience strongest for:

Private Real Assets
Global ex-U.S. Equity
Global ex-U.S. Small Cap Equity

Total \$ Fees down most:

U.S. Large Cap Equity
Hedge Fund-of-Funds

Increased Passive Usage in:

U.S. Smid/Small/Micro Cap Equity
(now 27%, +10% from 2019 study)

U.S. Large Cap Equity (now 69%, +8% from 2019)

Core Fixed Income (now 48%, +4% from 2019)

Popular Vehicles

Separate account	62%
CIT	17%
Commingled	12%

97%

of total fees paid
were to active
managers (down
1% from 2019)

CONCENTRATED

50% of total
active fees
go to 11%
of firms
(31)

62%

of total assets
managed actively
(down 8% from 2019)

Highest Fees

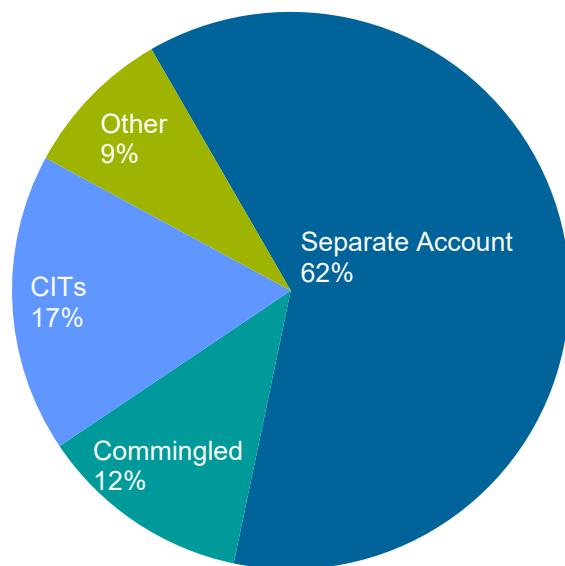
Hedge Fund-of-Funds	117 bps
Private Real Assets	84 bps
Global ex-U.S./Global Small Cap	71 bps
U.S. Smid/Small/Micro	67 bps
Emerging/Frontier	64 bps

Lowest Fees

Passive U.S. Large Cap	2 bps
Passive Core Fixed Income	3 bps

Fee Database Profile

Investment Products by Vehicle Type



- > **300** distinct investment firms
- \$597.7 billion** total assets under management
- \$1.4 billion** total fees paid in 2020
- > **160** distinct asset owners represented

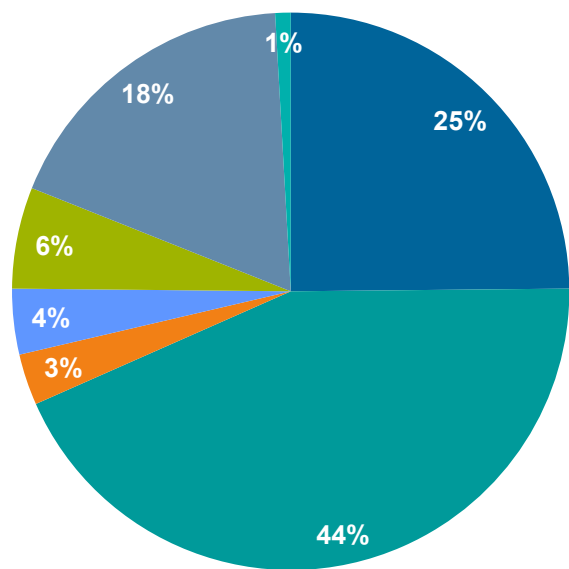
Vehicles	Count	AUM (\$mm)	Average AUM (\$mm)
Separate Account	1,053	\$473,952	\$450
Commingled	210	\$53,295	\$254
CITs	296	\$52,355	\$177
Other	150	\$18,116	\$121
Total	1,709	\$597,718	\$350

Institutional Portfolio Fee Database Statistics

Mandate Type	Portfolios	Total AUM (\$mm)	Average AUM (\$mm)	Total Fees (\$mm)	Weighted Average Fee	Average Portfolio Fee (\$000)
All	1,709	\$597,718	\$350	\$1,438	24 bps	\$841
Active	1,421 (83%)	\$369,991 (62%)	\$260	\$1,392 (97%)	38 bps	\$980
Passive	288 (17%)	\$227,727 (38%)	\$791	\$46 (3%)	2 bps	\$158

Fee Database Profile

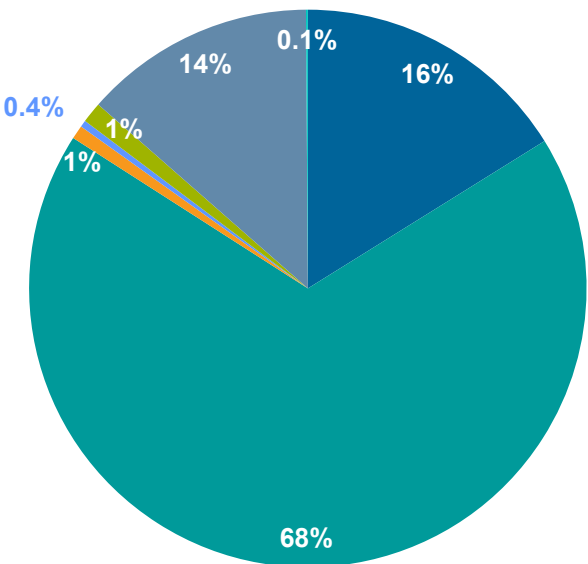
Asset Pool Type by Percent of Mandates



- Corporate Funds
- Public Funds
- Union Funds
- Foundations
- Endowments
- Defined Contribution Plans
- Other

> 160 distinct asset owners

Asset Pool Type by Percent of Assets



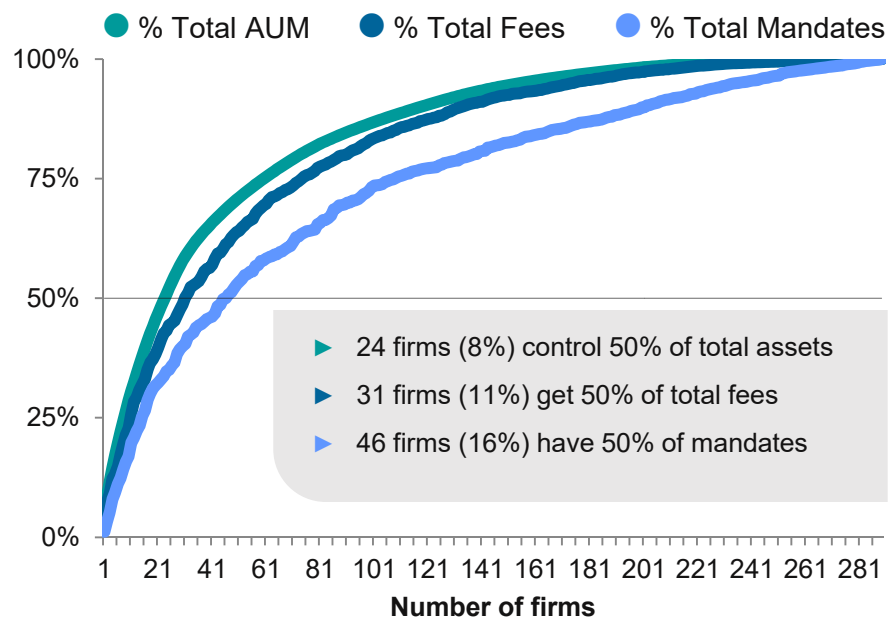
Values may not total 100% due to rounding.

Industry Concentration of AUM and Fees

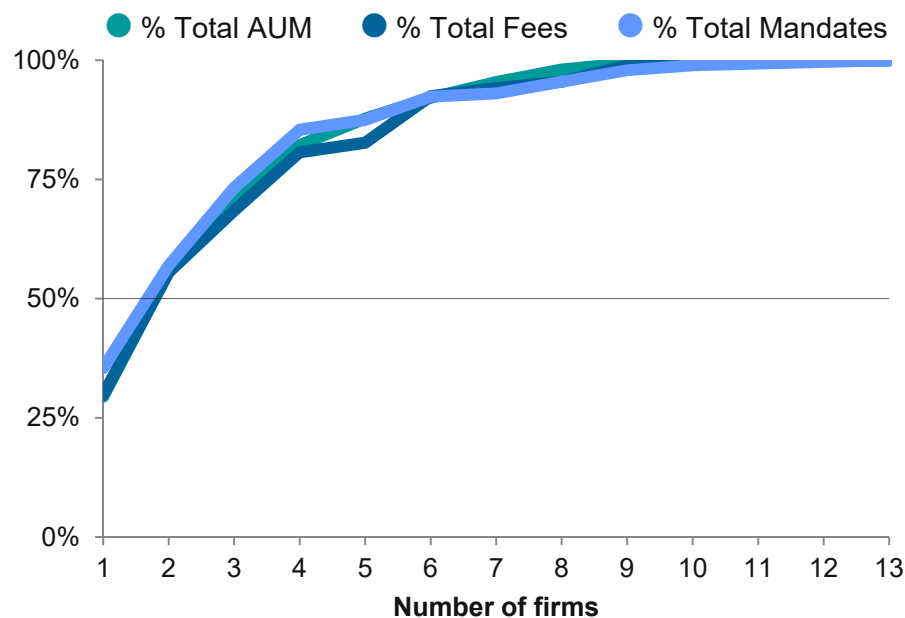
Market share concentration by firm—active and passive

- ▶ **Active** management represents **~62% of assets** (-8% from 2019 Study) and **~97% of fees** (-1%).
- ▶ **Passive** management now represents **~38% of assets** (+8%) and **~3% of fees** (+1%) and is **dominated by 2–4 firms**.

Active Management



Passive Management



For a full explanation of the analysis on this page please refer to page 7.

Summary Asset Class Comparisons

	Total fees paid (\$million)	Total AUM (\$billion)	Average Mandate (\$million)	Average Fee (bps)	Average Fee (\$'000)
Global ex-U.S. Equity	\$306	\$79	\$320	54 bps	\$1,236
Smid/Small/Micro Cap	\$207	\$35	\$144	67 bps	\$862
Private Real Assets	\$160 ↑	\$25	\$163	84 bps	\$1,041
U.S. Large Cap	\$160 ↓	\$50	\$257	40 bps	\$828
Global Equity	\$110	\$27	\$590	45 bps	\$2,381
Emerging / Frontier	\$99	\$19	\$306	64 bps	\$1,616
Global/Global ex-U.S. Sm Cap	\$58	\$9	\$192	71 bps	\$1,176
Core Fixed Income	\$55	\$39	\$321	19 bps	\$451
Long Duration	\$49	\$31	\$471	18 bps	\$746
Core Plus Fixed Income	\$45	\$23	\$274	24 bps	\$538
High Yield / Bank Loans	\$43	\$11	\$320	43 bps	\$1,300
REITs	\$22	\$5	\$172	55 bps	\$756
U.S. Mid Cap	\$21	\$5	\$191	56 bps	\$829
Hedge Funds	\$20 ↓	\$2	\$154	117 bps	\$1,313
Emerging Debt	\$17	\$4	\$289	45 bps	\$1,310
Global ex-U.S. Equity - passive	\$15 ↑	\$55	\$982	6 bps	\$260
U.S. Large Cap - passive	\$13 ↑	\$110	\$869	2 bps	\$104
Global/Global ex-U.S. Fixed	\$13	\$4	\$161	38 bps	\$501
Multi-Asset Class	\$8	\$2	\$134	54 bps	\$482
Core Fixed Income - passive	\$7	\$36	\$732	3 bps	\$136
Smid/Small/Micro Cap - passive	\$5	\$13	\$566	4 bps	\$197

Asset Class Coverage

Active

U.S. Large Cap and All Cap Equity
U.S. Mid Cap Equity
U.S. Smid, Small, and Micro Cap Equity
Global ex-U.S. Large Cap Equity
Global Large Cap Equity
Global ex-U.S. Small Cap and Global Small Cap Equity
Emerging Market and Frontier Market Equity
Real Estate Investment Trusts (REITs)
Core Fixed Income
Core Plus Fixed Income
High Yield and Bank Loan Fixed Income
Long Duration Fixed Income
Global Fixed Income
Emerging Market Debt

Alternatives

Multi-Asset Class (MACs)
Hedge Fund-of-Funds
Private Open-Ended Real Assets

Passive

U.S. Large Cap and All Cap Equity
U.S. Smid, Small, and Micro Cap Equity
Global ex-U.S. Large Cap Equity
U.S. Core Fixed Income

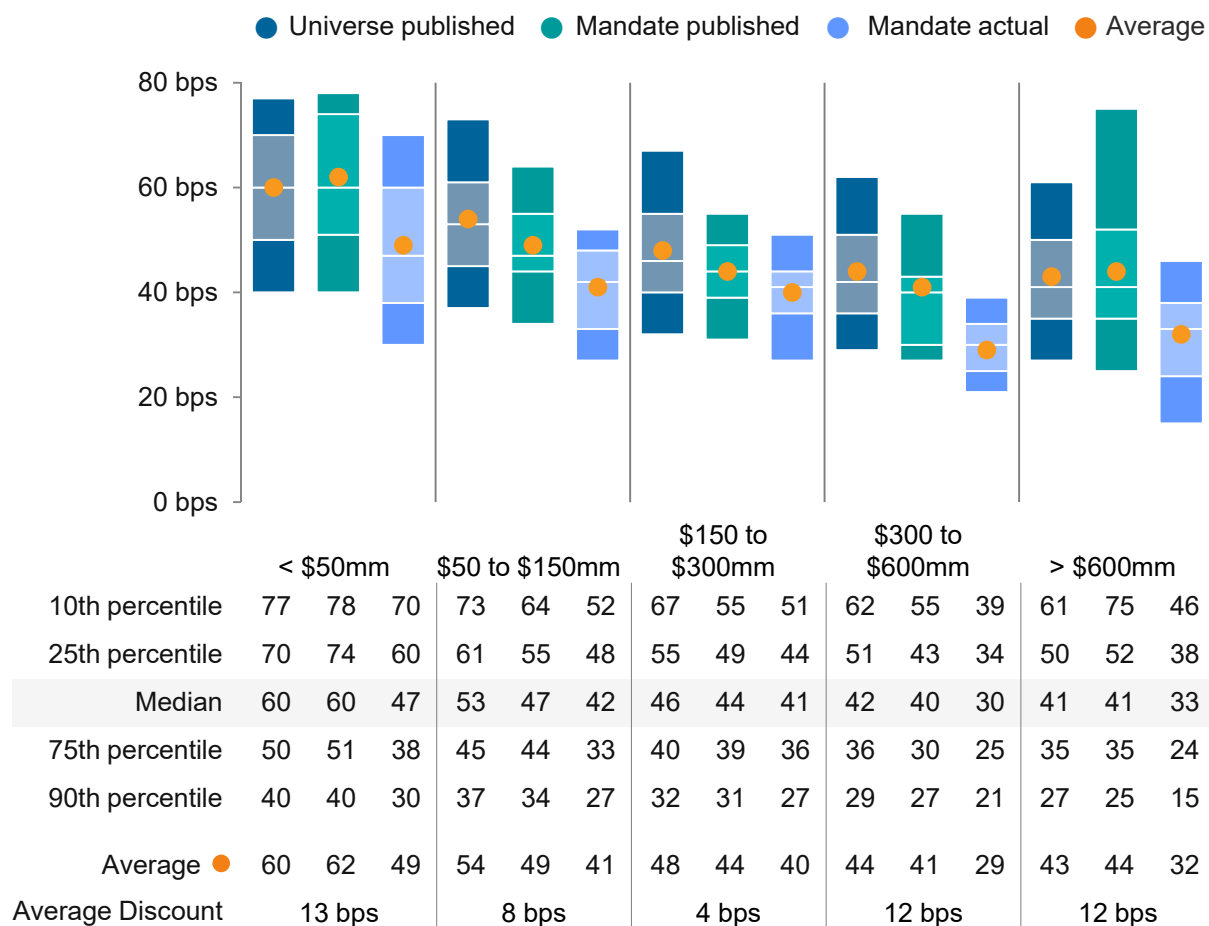
Active U.S. Equity

Actual vs. Published Fees: Active U.S. Large Cap and All Cap Equity

Fees by account size

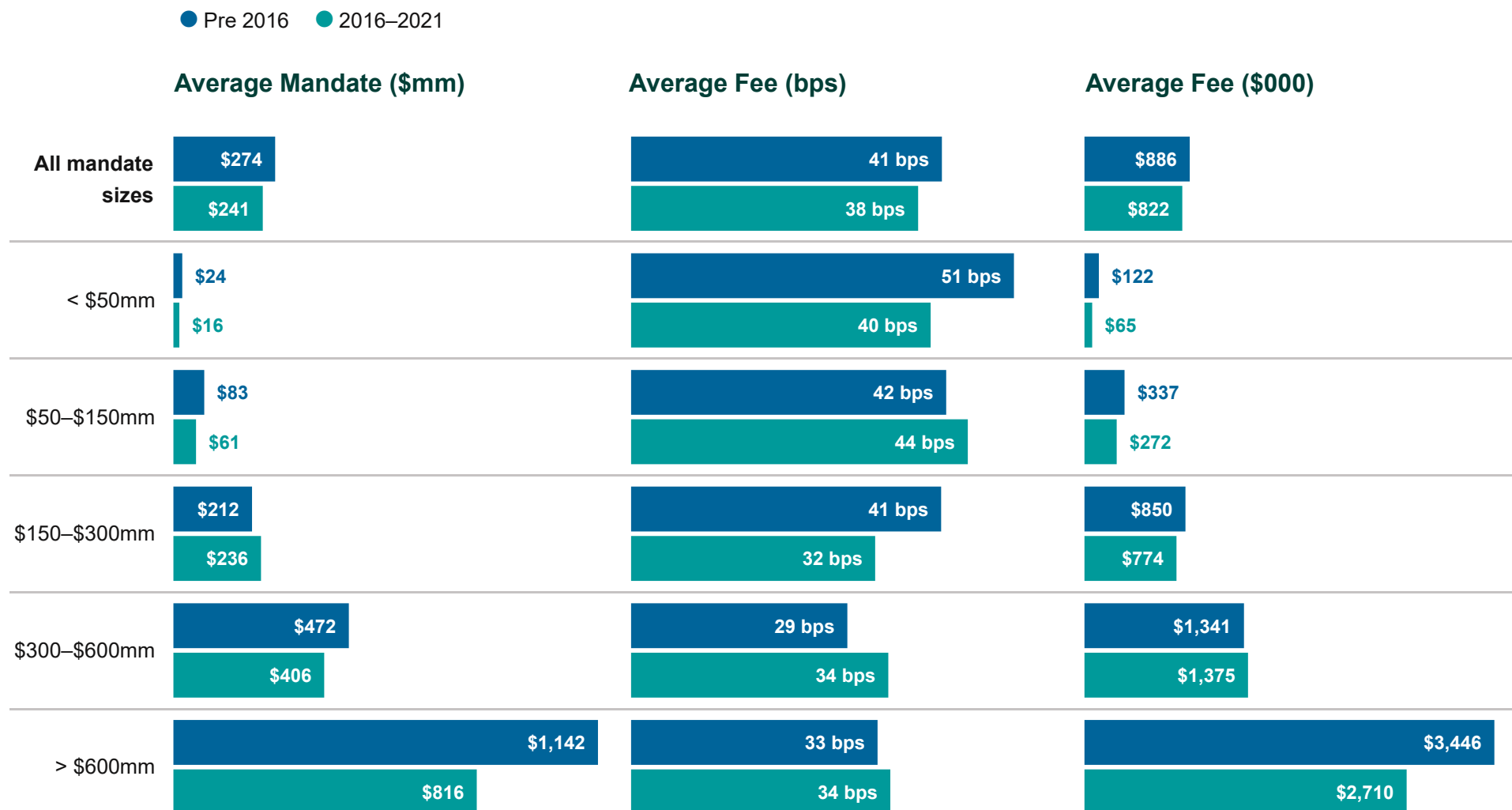
Actual Fees Paid Summary

Total AUM (\$mm)	\$49,513
Total count	193
Average AUM (\$mm)	\$257
Median AUM (\$mm)	\$108
Total average fee (bps / \$)	40 / \$828,499
Total median fee (bps / \$)	40 / \$407,550
Total sum fees (\$)	\$159,900,235
Weighted average fee	32 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Active U.S. Large Cap and All Cap Equity



For a full explanation of the analysis on this page please refer to page 6.

Concentration Analysis: Active U.S. Large Cap and All Cap Equity

\$49.5 billion in assets and **\$159.9 million** in fees

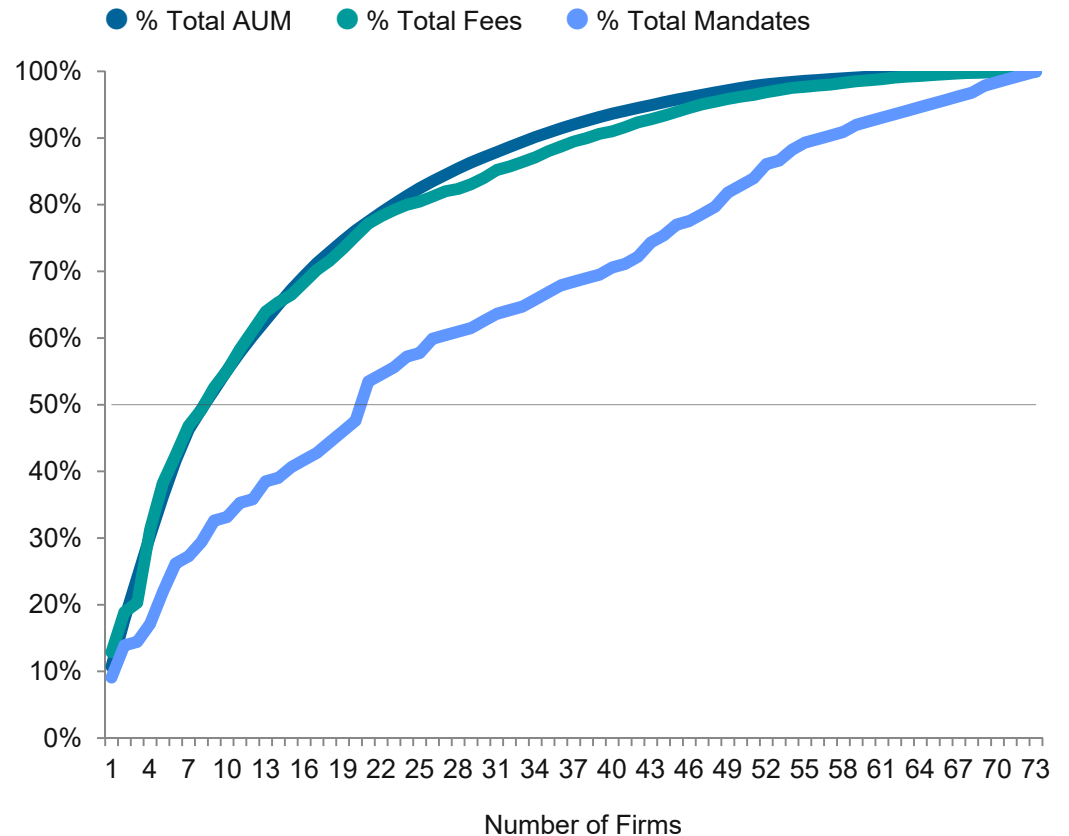
193 mandates with **73** different firms

- ▶ 50% of assets managed by 9 firms (12%)
- ▶ 50% of fees made by 9 firms (12%)
- ▶ 50% of mandates run by 21 firms (29%)

Active management has **31% AUM** (-8% from 2019 study) in this segment (69% passive)

Active management has **92% fees** (-2%) in this segment (8% passive)

Concentration by Firm



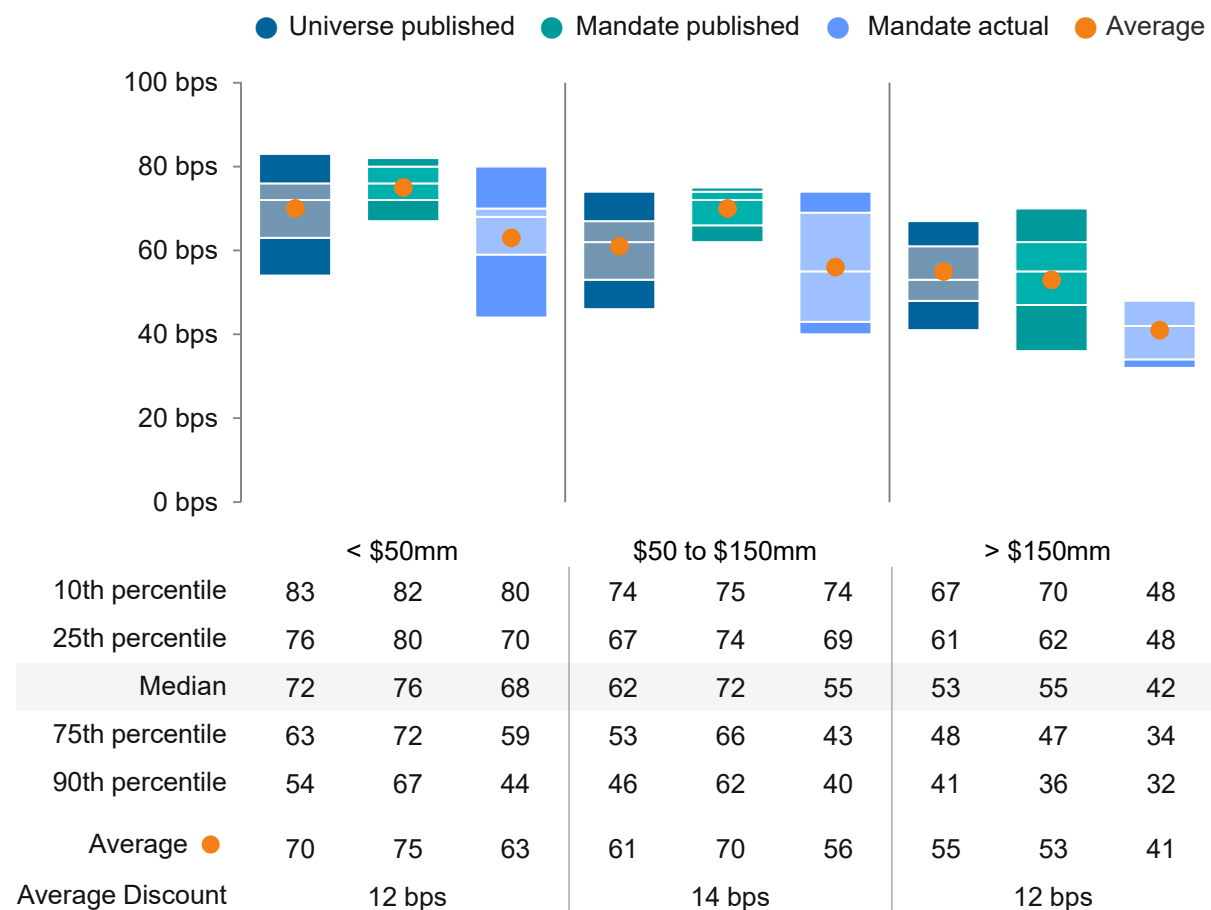
For a full explanation of the analysis on this page please refer to page 7.

Actual vs. Published Fees: Active U.S. Mid Cap Equity

Fees by account size

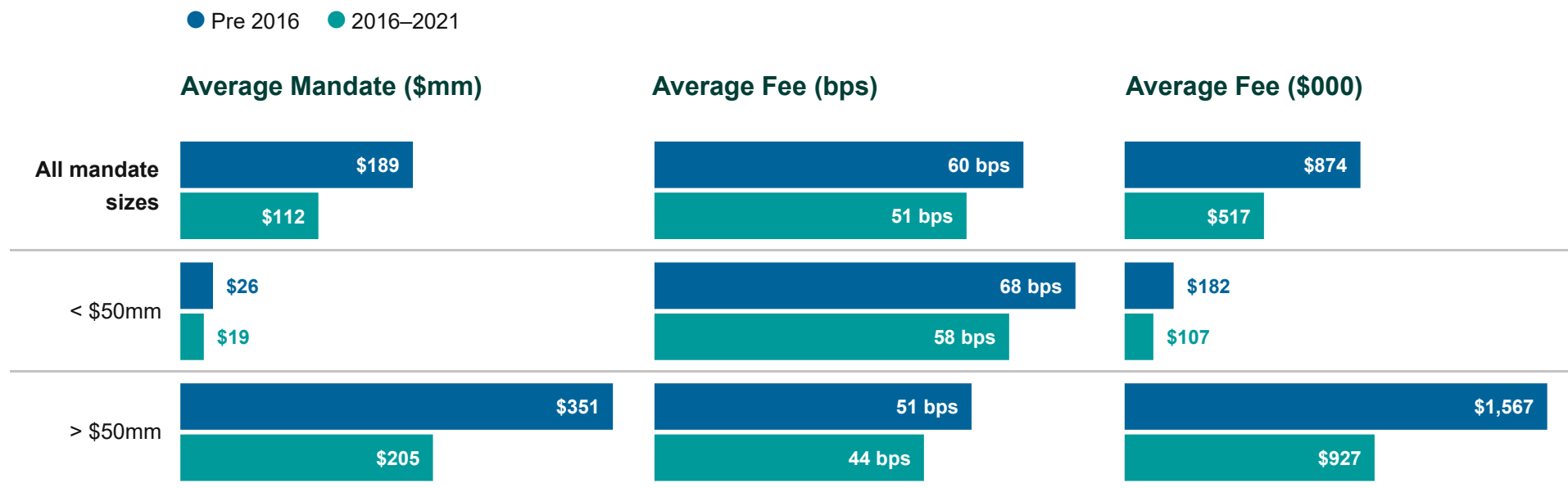
Actual Fees Paid Summary

Total AUM (\$mm)	\$4,785
Total count	25
Average AUM (\$mm)	\$191
Median AUM (\$mm)	\$49
Total average fee (bps / \$)	56 / \$828,995
Total median fee (bps / \$)	56 / \$416,500
Total sum fees (\$)	\$20,724,870
Weighted average fee	43 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Active U.S. Mid Cap Equity



For a full explanation of the analysis on this page please refer to page 6.

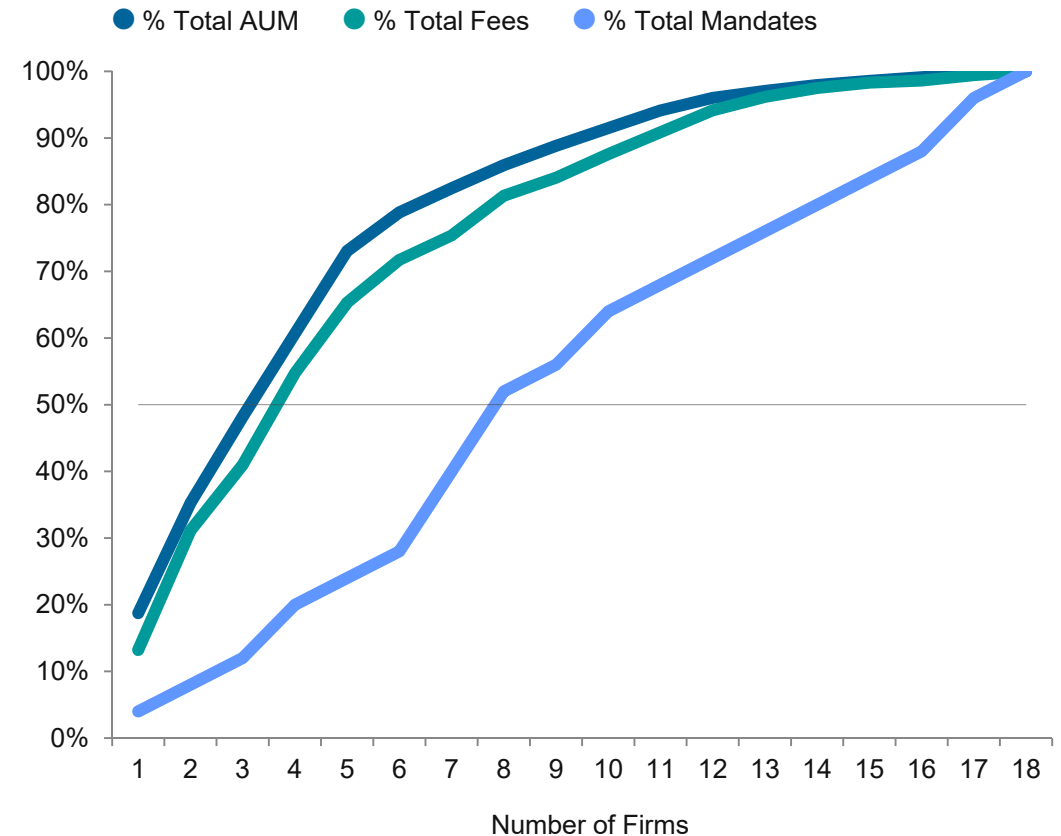
Concentration Analysis: Active U.S. Mid Cap Equity

\$4.8 billion in assets and **\$20.7 million** in fees

25 mandates with **18** different firms

- ▶ 50% of assets managed by 4 firms (22%)
- ▶ 50% of fees made by 4 firms (22%)
- ▶ 50% of mandates run by 8 firms (44%)

Concentration by Firm



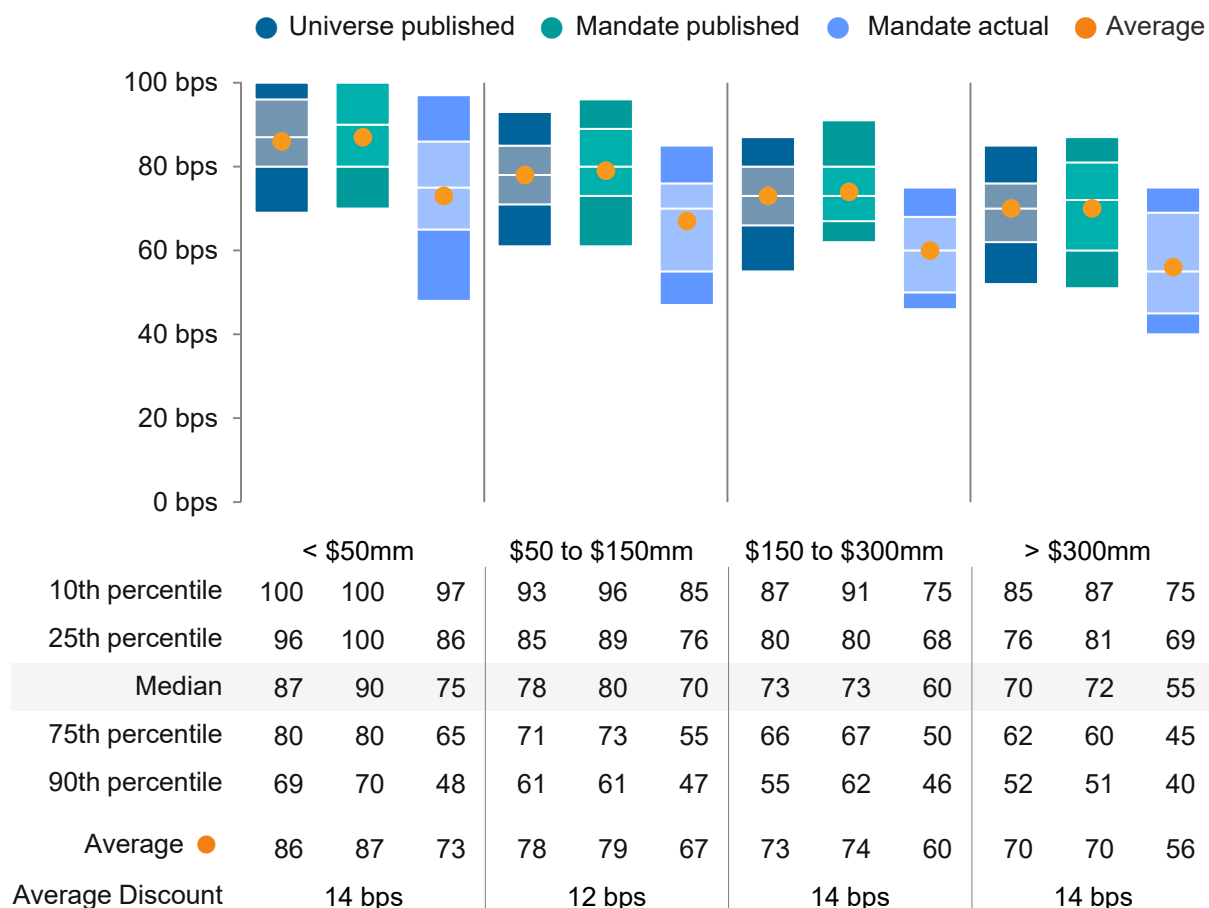
For a full explanation of the analysis on this page please refer to page 7.

Actual vs. Published Fees: Active U.S. Smid, Small, and Micro Cap Equity

Fees by account size

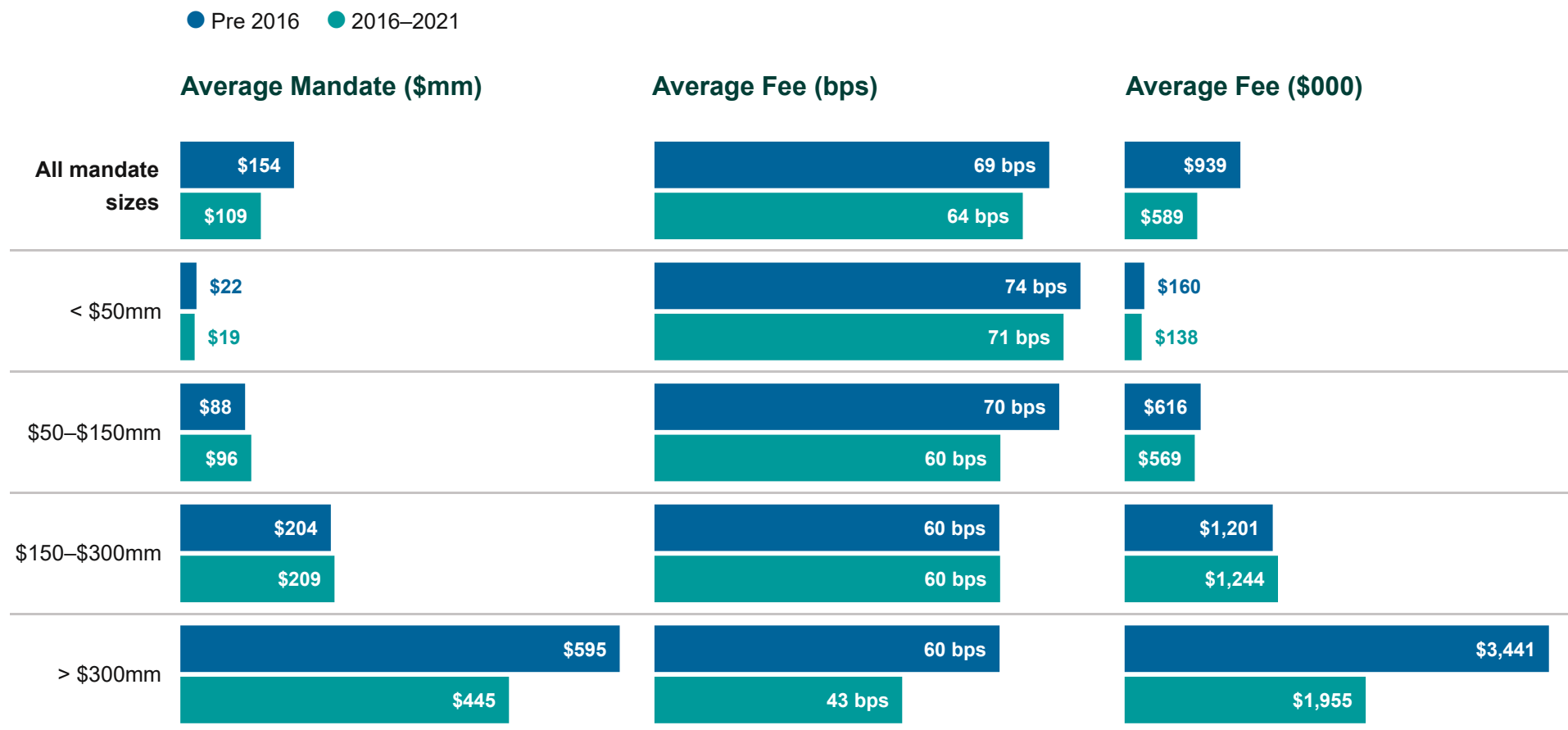
Actual Fees Paid Summary

Total AUM (\$mm)	\$34,549
Total count	240
Average AUM (\$mm)	\$144
Median AUM (\$mm)	\$63
Total average fee (bps / \$)	67 / \$861,903
Total median fee (bps / \$)	69 / \$430,358
Total sum fees (\$)	\$206,856,707
Weighted average fee	60 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Active U.S. Smid, Small, and Micro Cap Equity



For a full explanation of the analysis on this page please refer to page 6.

Concentration Analysis: Active U.S. Smid, Small, and Micro Cap Equity

\$34.5 billion in assets and **\$206.9 million** in fees

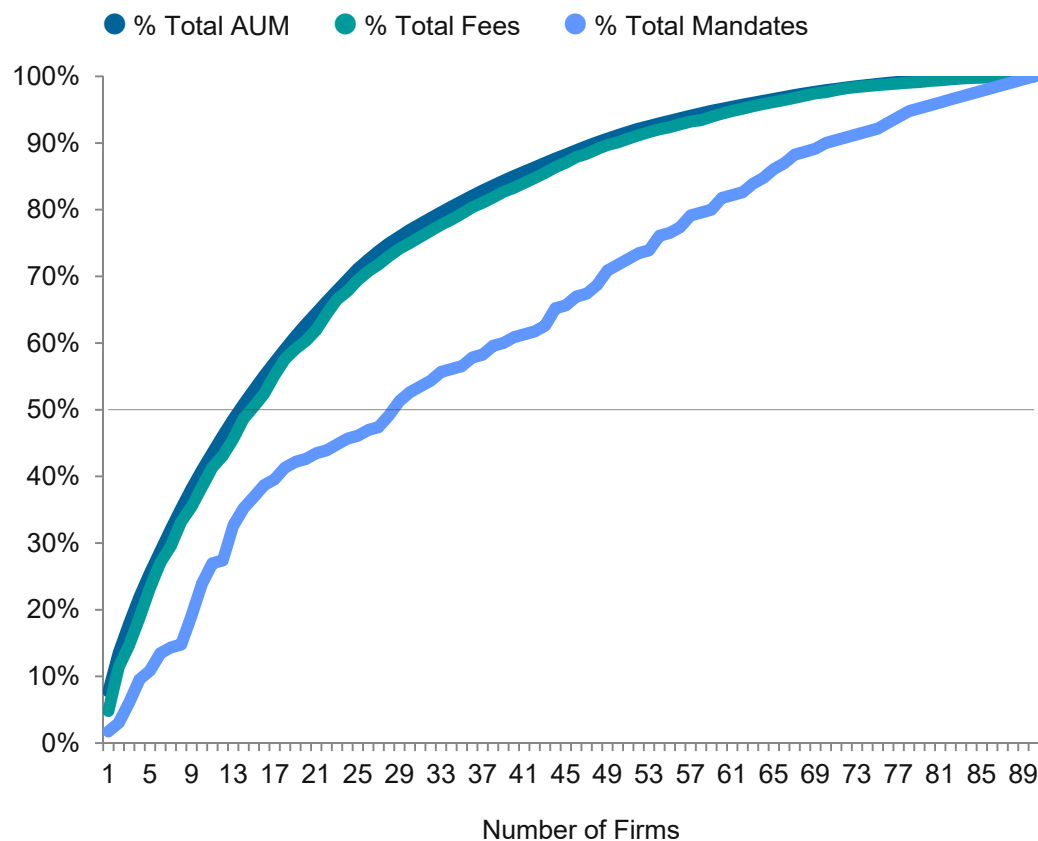
240 mandates with **90** different firms

- ▶ 50% of assets managed by 14 firms (16%)
- ▶ 50% of fees made by 15 firms (17%)
- ▶ 50% of mandates run by 29 firms (32%)

Active management has **73% AUM** (-10% from 2019 study) in this segment (27% passive)

Active management has **98% fees** (-1%) in this segment (2% passive)

Concentration by Firm



For a full explanation of the analysis on this page please refer to page 7.

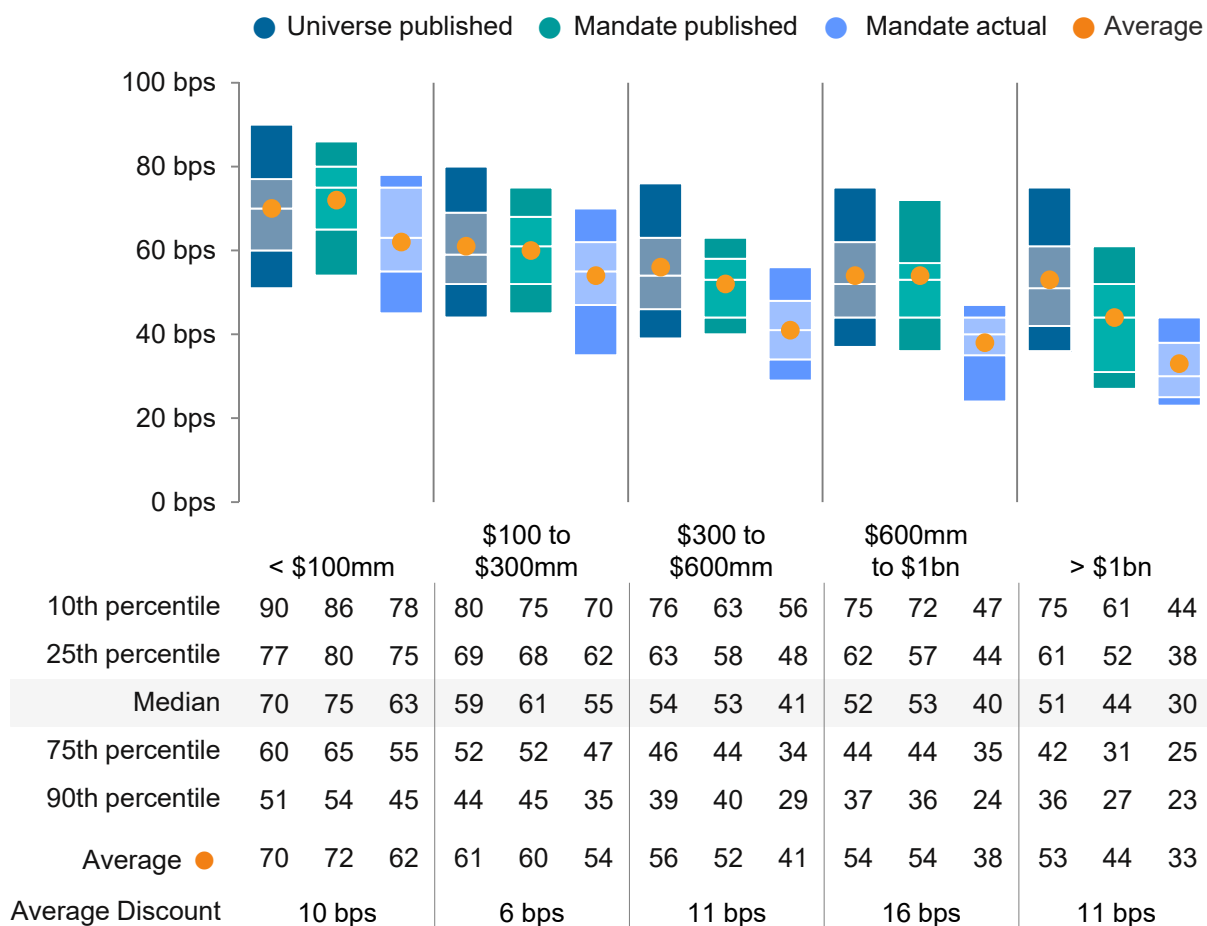
Active Global ex-U.S. / Global Equity

Actual vs. Published Fees: Active Global ex-U.S. Large Cap Equity

Fees by account size

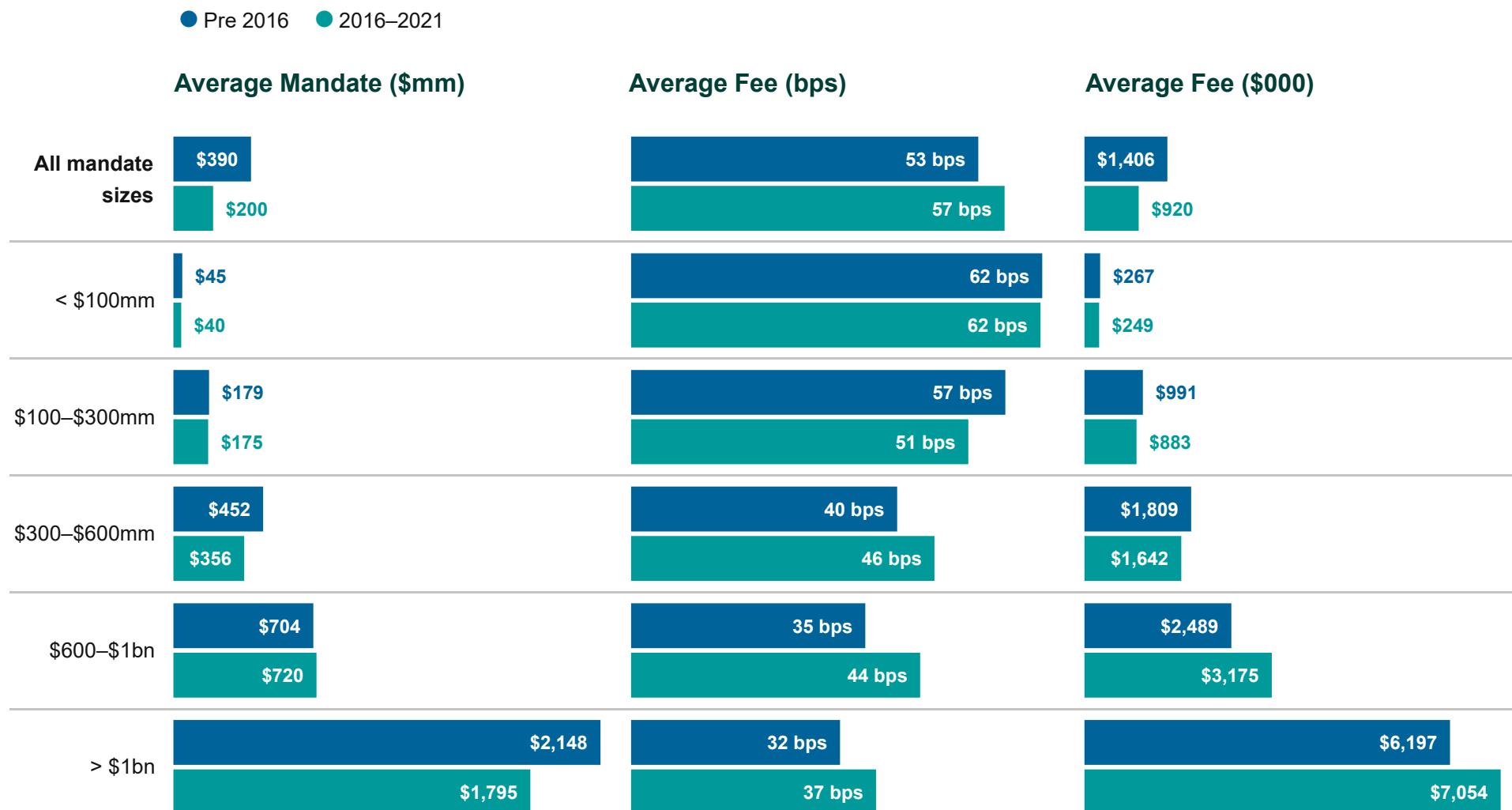
Actual Fees Paid Summary

Total AUM (\$mm)	\$79,430
Total count	248
Average AUM (\$mm)	\$320
Median AUM (\$mm)	\$90
Total average fee (bps / \$)	54 / \$1,235,599
Total median fee (bps / \$)	55 / \$536,080
Total sum fees (\$)	\$306,428,576
Weighted average fee	39 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Active Global ex-U.S. Large Cap Equity



For a full explanation of the analysis on this page please refer to page 6.

Concentration Analysis: Active Global ex-U.S. Large Cap Equity

\$79.4 billion in assets and **\$306.4 million** in fees

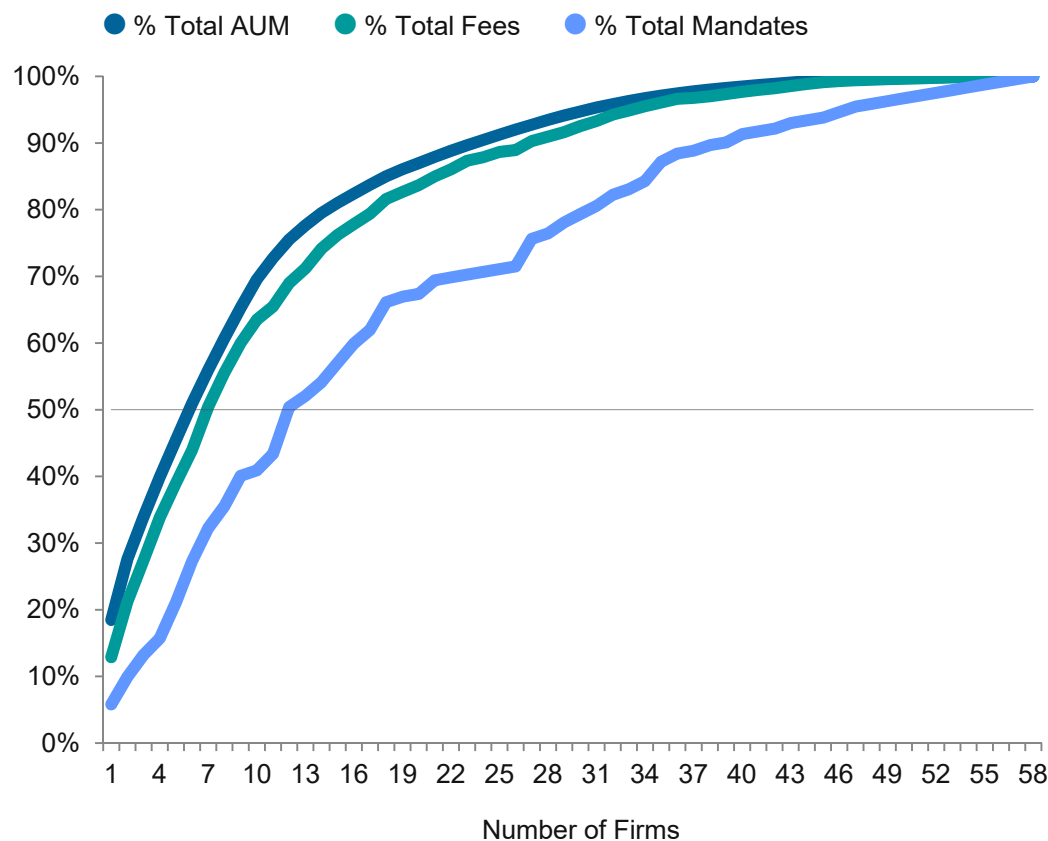
248 mandates with **58** different firms

- ▶ 50% of assets managed by 6 firms (10%)
- ▶ 50% of fees made by 7 firms (12%)
- ▶ 50% of mandates run by 12 firms (21%)

Active management has **59% AUM** (-1% from 2019 study) in this segment (41% passive)

Active management has **95% fees** (-1%) in this segment (5% passive)

Concentration by Firm



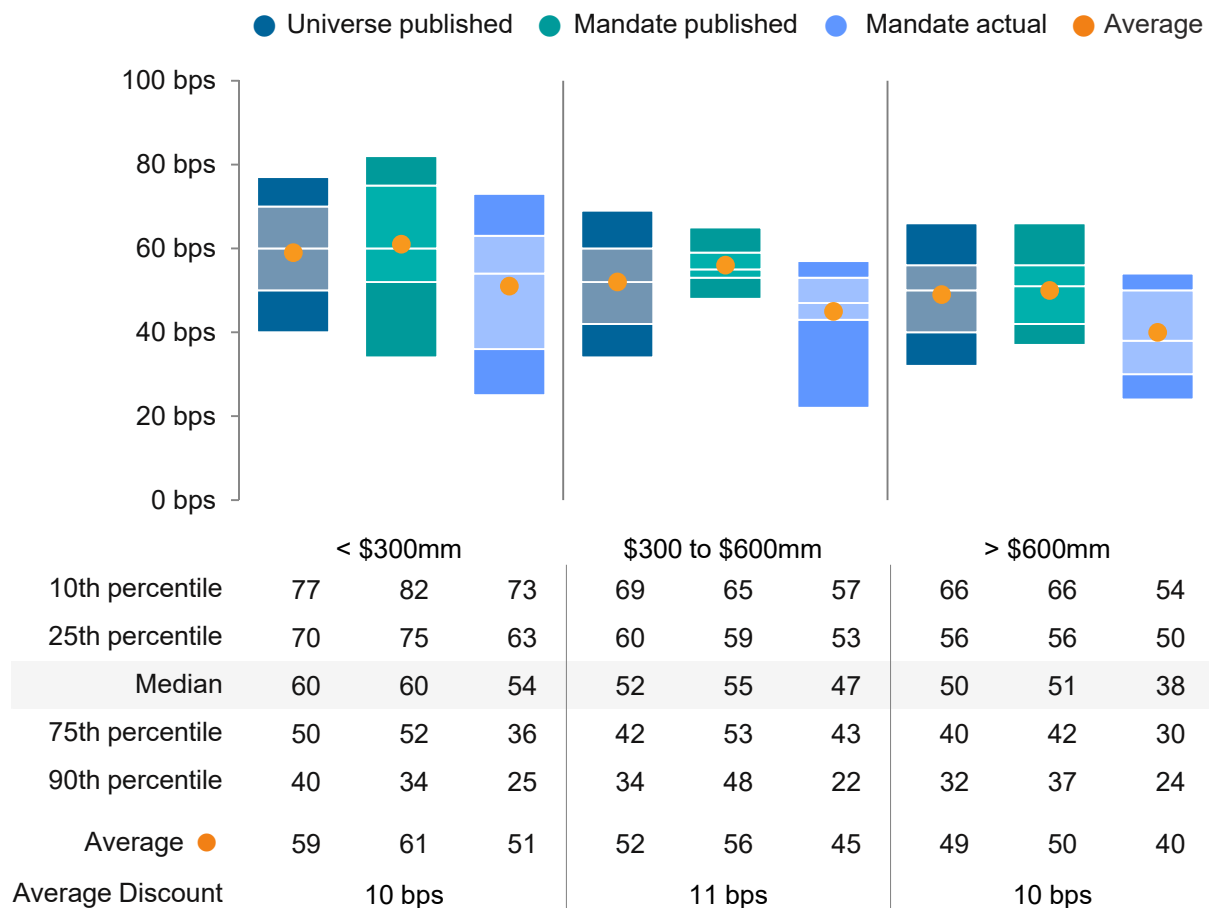
For a full explanation of the analysis on this page please refer to page 7.

Actual vs. Published Fees: Active Global Large Cap Equity

Fees by account size

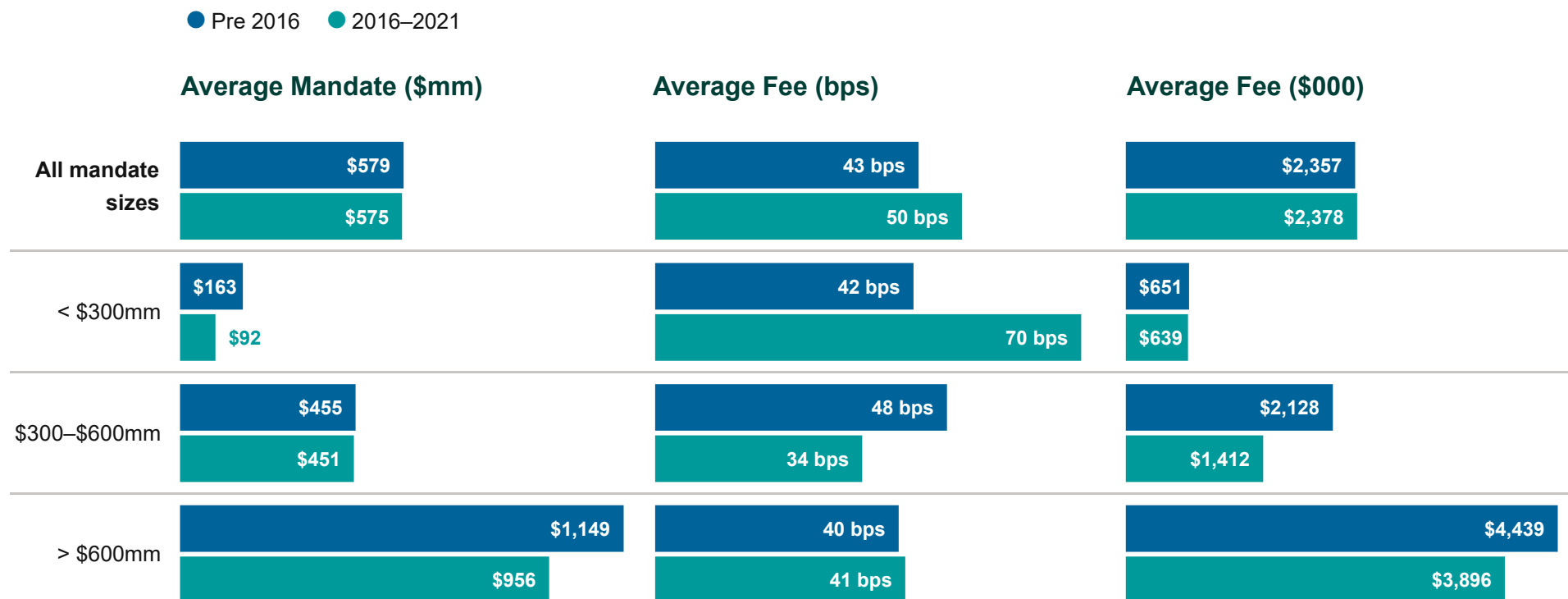
Actual Fees Paid Summary

Total AUM (\$mm)	\$27,158
Total count	46
Average AUM (\$mm)	\$590
Median AUM (\$mm)	\$513
Total average fee (bps / \$)	45 / \$2,380,688
Total median fee (bps / \$)	46 / \$1,983,078
Total sum fees (\$)	\$109,511,640
Weighted average fee	40 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Active Global Large Cap Equity



For a full explanation of the analysis on this page please refer to page 6.

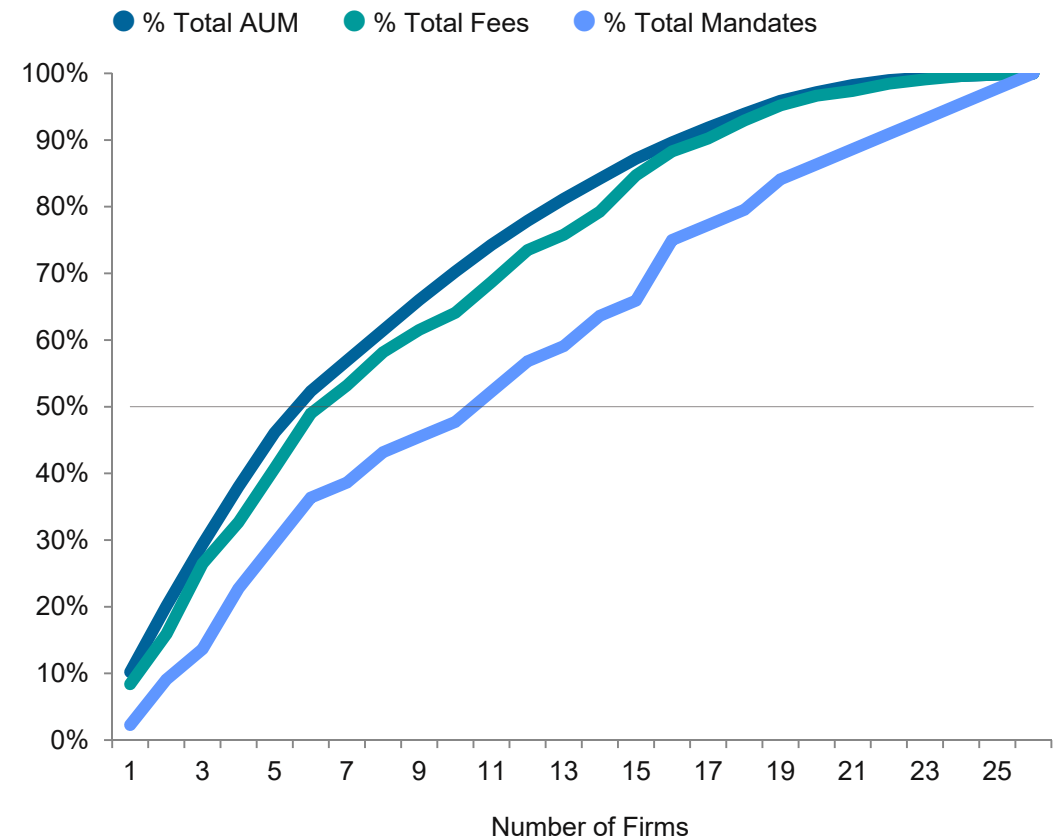
Concentration Analysis: Active Global Large Cap Equity

\$27.2 billion in assets and **\$109.5 million** in fees

46 mandates with **26** different firms

- ▶ 50% of assets managed by 6 firms (23%)
- ▶ 50% of fees made by 7 firms (27%)
- ▶ 50% of mandates run by 11 firms (42%)

Concentration by Firm



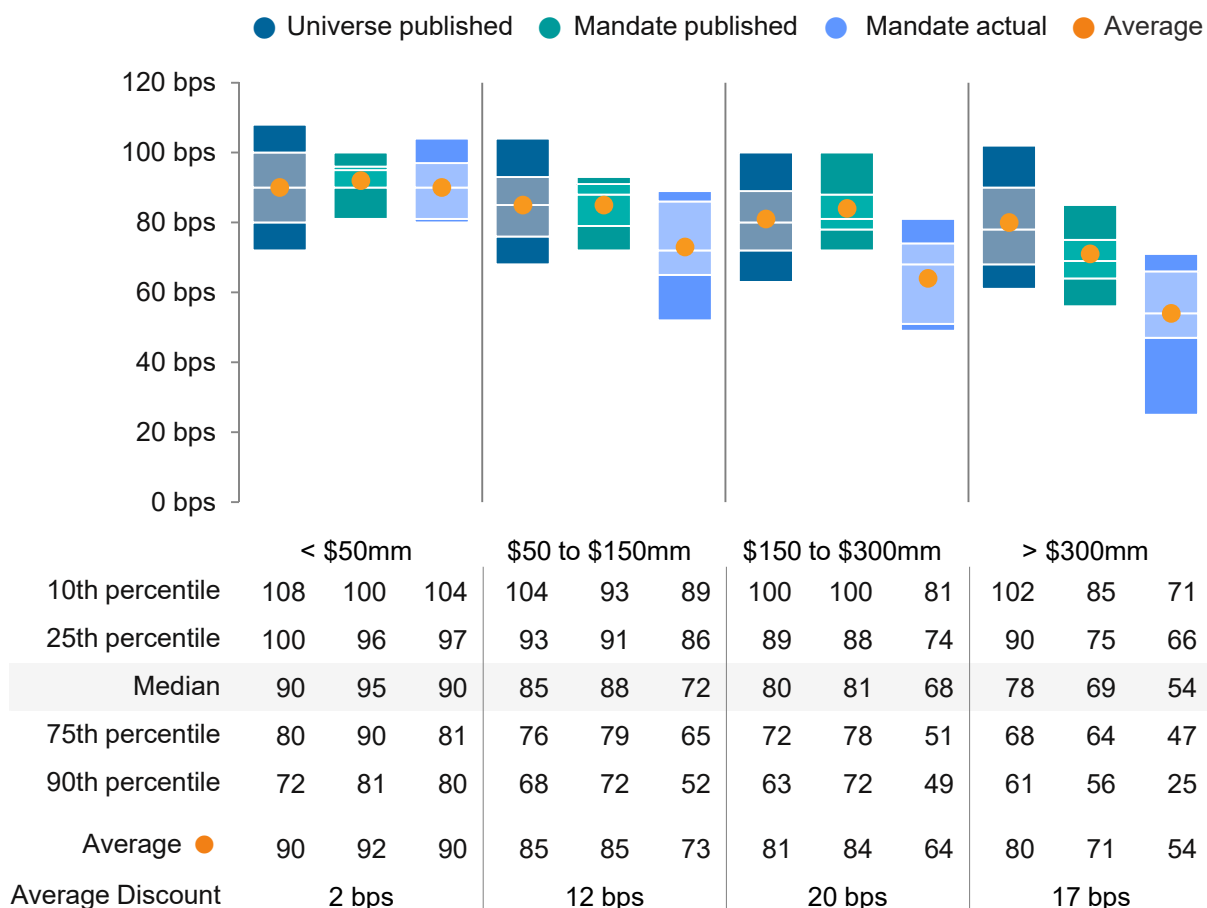
For a full explanation of the analysis on this page please refer to page 7.

Actual vs. Published Fees: Active Global ex-U.S. Small Cap and Global Small Cap Equity

Fees by account size

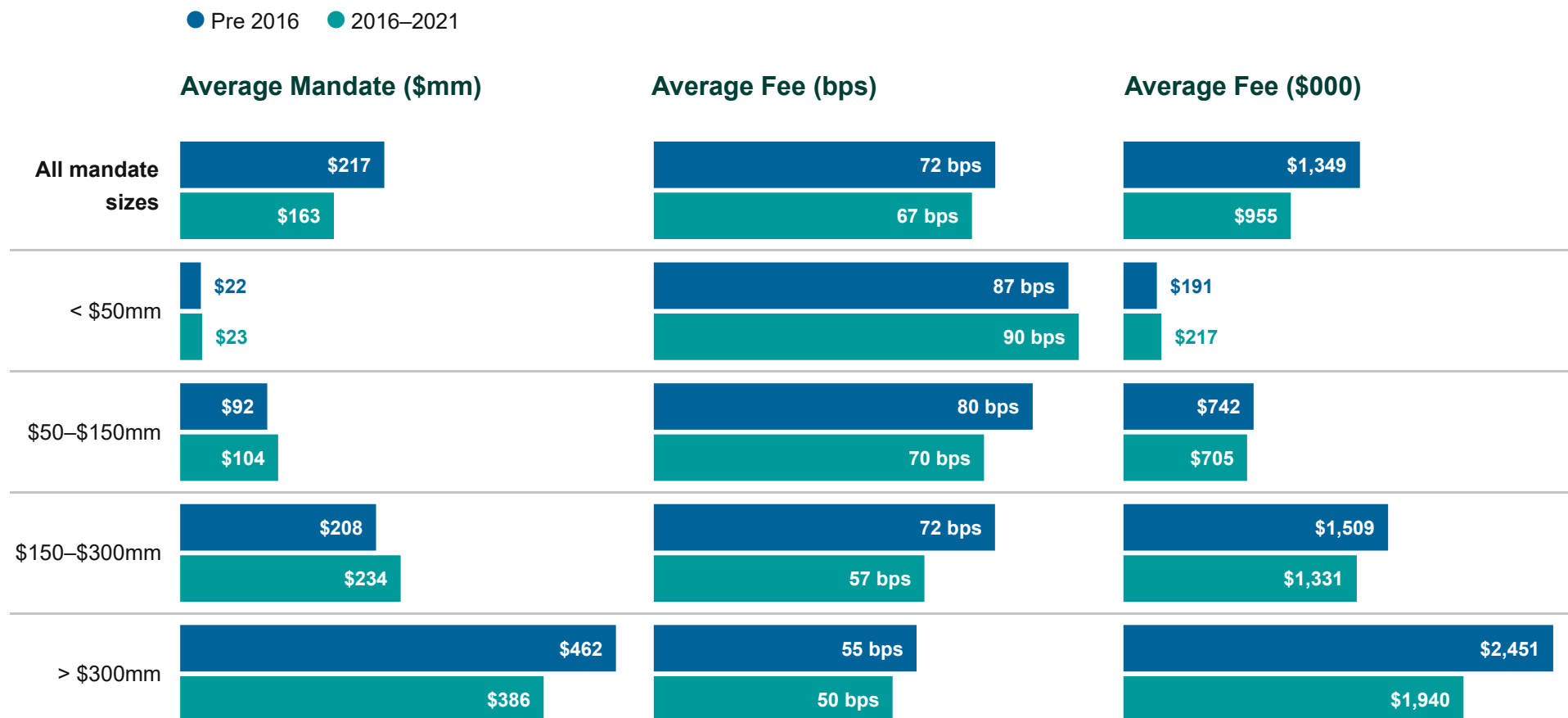
Actual Fees Paid Summary

Total AUM (\$mm)	\$9,051
Total count	47
Average AUM (\$mm)	\$193
Median AUM (\$mm)	\$129
Total average fee (bps / \$)	69 / \$1,147,126
Total median fee (bps / \$)	71 / \$875,000
Total sum fees (\$)	\$53,914,900
Weighted average fee	60 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Active Global ex-U.S. Small Cap and Global Small Cap Equity



For a full explanation of the analysis on this page please refer to page 6.

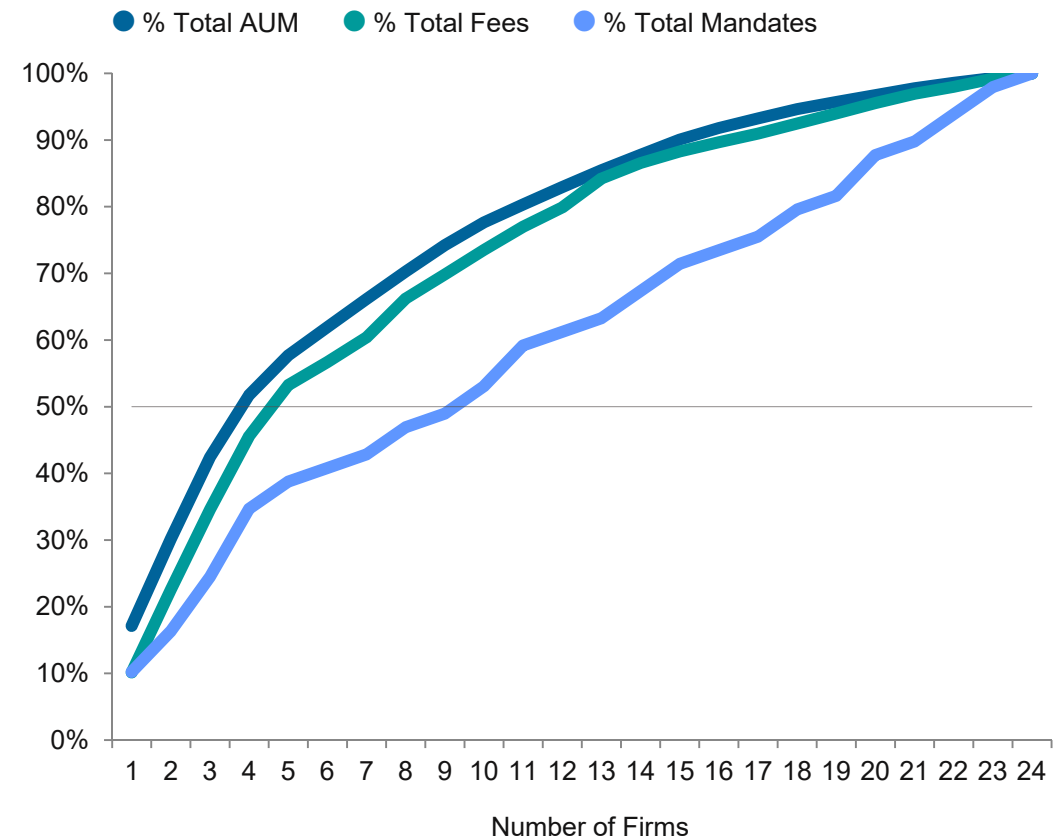
Concentration Analysis: Active Global ex-U.S. Small Cap and Global Small Cap Equity

\$9.1 billion in assets and **\$53.9 million** in fees

47 mandates with **24** different firms

- ▶ 50% of assets managed by 4 firms (17%)
- ▶ 50% of fees made by 5 firms (21%)
- ▶ 50% of mandates run by 10 firms (42%)

Concentration by Firm



For a full explanation of the analysis on this page please refer to page 7.

Actual vs. Published Fees: Active Emerging Market and Frontier Market Equity

Fees by account size

Actual Fees Paid Summary

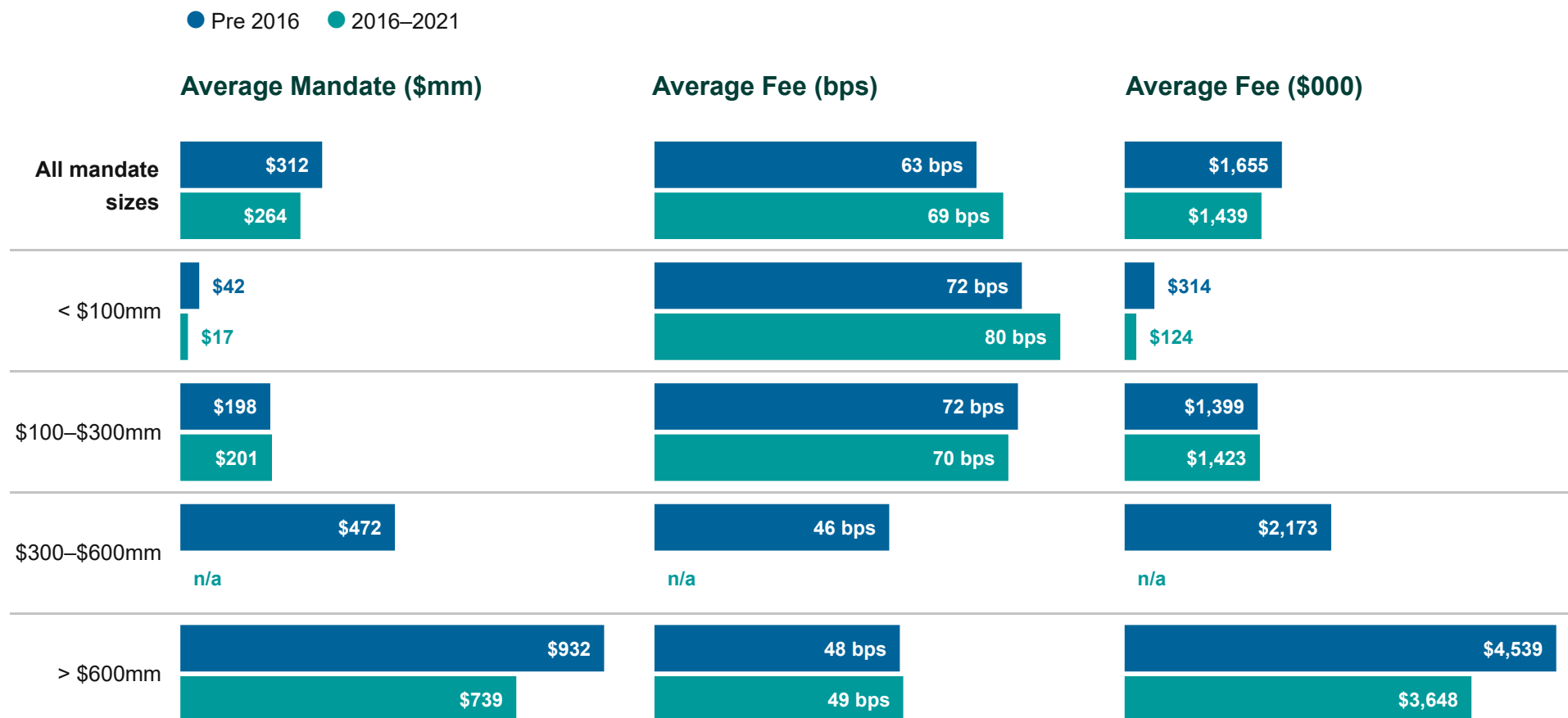
Total AUM (\$mm)	\$18,696
Total count	61
Average AUM (\$mm)	\$306
Median AUM (\$mm)	\$200
Total average fee (bps / \$)	64 / \$1,616,089
Total median fee (bps / \$)	67 / \$1,138,855
Total sum fees (\$)	\$98,581,443
Weighted average fee	53 bps



	< \$100mm			\$100 to \$300mm			\$300 to \$600mm			> \$600mm		
10th percentile	100	99	95	94	93	80	90	87	67	88	80	59
25th percentile	95	90	84	86	85	78	81	78	54	79	72	57
Median	85	80	78	77	80	74	71	70	48	70	65	53
75th percentile	75	73	65	67	75	69	63	66	39	61	60	38
90th percentile	65	50	47	58	68	54	53	58	34	51	51	32
Average ●	85	79	75	77	80	71	72	71	48	70	65	47
Average Discount	4 bps			9 bps			23 bps			18 bps		

For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Active Emerging Market and Frontier Market Equity



For a full explanation of the analysis on this page please refer to page 6.

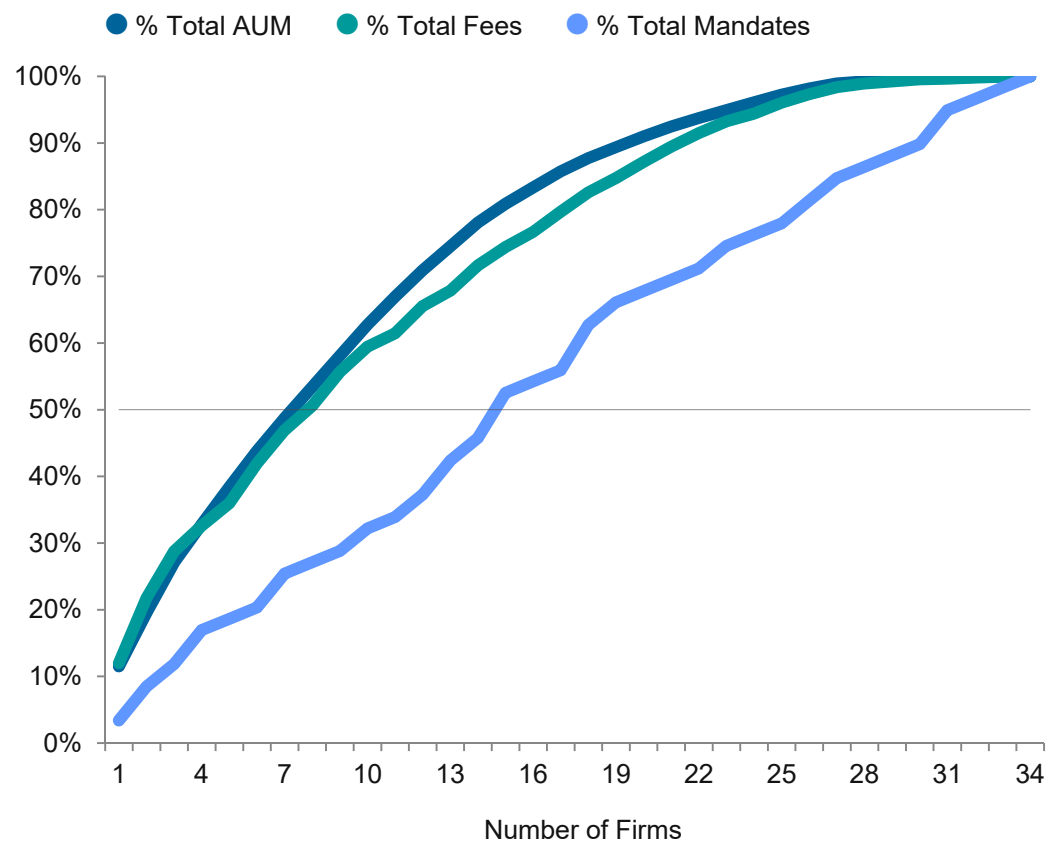
Concentration Analysis: Active Emerging Market and Frontier Market Equity

\$18.7 billion in assets and **\$98.6** million in fees

61 mandates with **34** different firms

- ▶ 50% of assets managed by 8 firms (24%)
- ▶ 50% of fees made by 8 firms (24%)
- ▶ 50% of mandates run by 15 firms (44%)

Concentration by Firm



For a full explanation of the analysis on this page please refer to page 7.

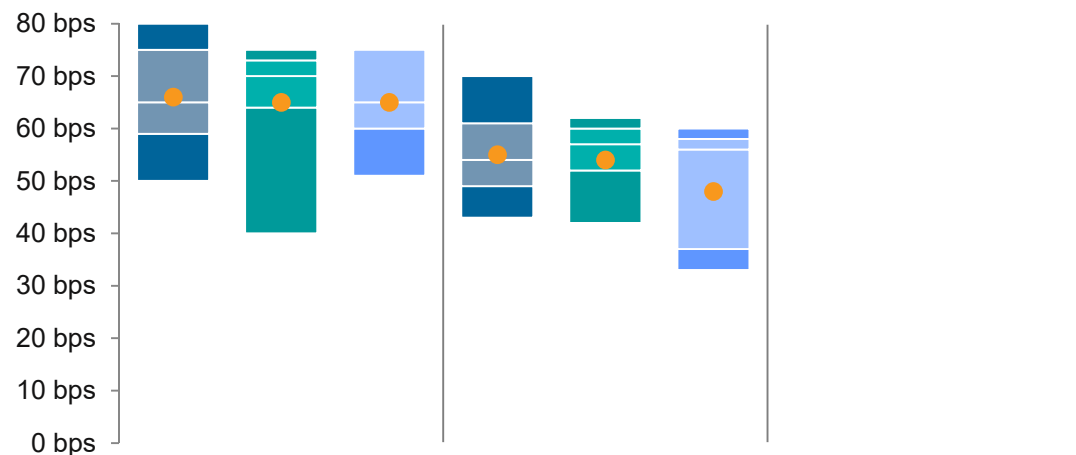
Actual vs. Published Fees: Active Real Estate Investment Trusts (REITs)

Fees by account size

Actual Fees Paid Summary

Total AUM (\$mm)	\$4,919
Total count	28
Average AUM (\$mm)	\$176
Median AUM (\$mm)	\$87
Total average fee (bps / \$)	57 / \$780,433
Total median fee (bps / \$)	60 / \$600,066
Total sum fees (\$)	\$21,852,117
Weighted average fee	44 bps

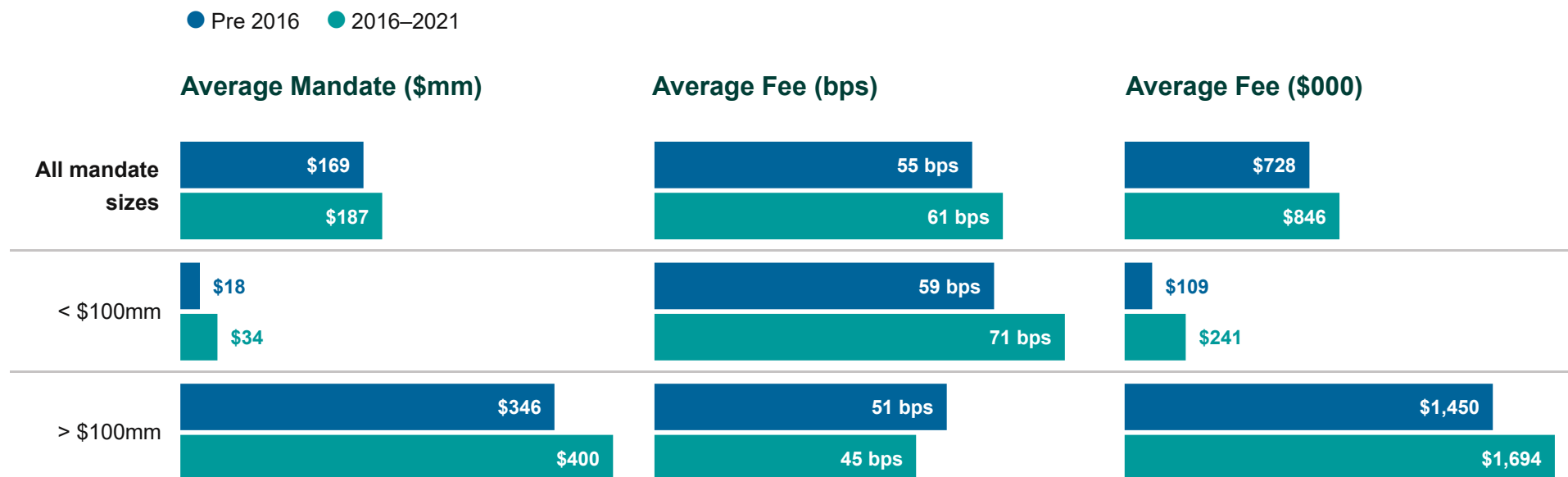
● Universe published ● Mandate published ● Mandate actual ● Average



	< \$100mm			> \$100mm		
10th percentile	80	75	75	70	62	60
25th percentile	75	73	75	61	60	58
Median	65	70	65	54	57	56
75th percentile	59	64	60	49	52	37
90th percentile	50	40	51	43	42	33
Average ●	66	65	65	55	54	48
Average Discount		0 bps			6 bps	

For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Active Real Estate Investment Trusts (REITs)



For a full explanation of the analysis on this page please refer to page 6.

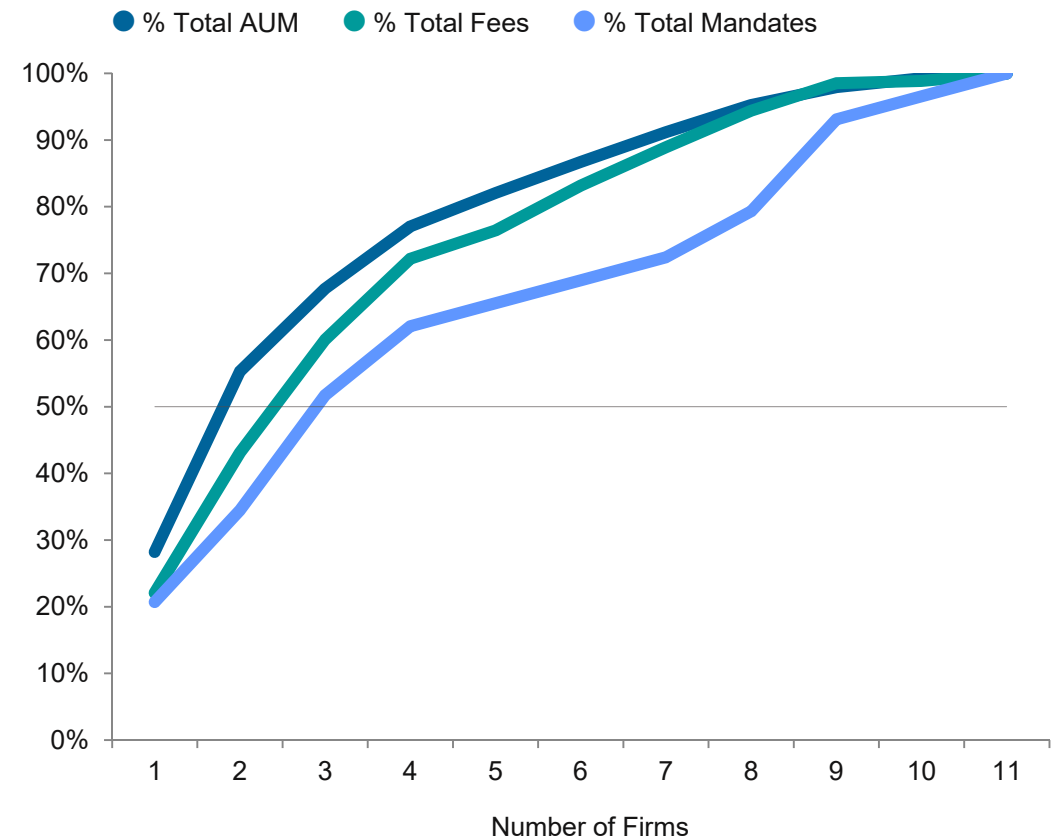
Concentration Analysis: Active Real Estate Investment Trusts (REITs)

\$4.9 billion in assets and **\$21.9** million in fees

28 mandates with **11** different firms

- ▶ 50% of assets managed by 2 firms (18%)
- ▶ 50% of fees made by 3 firms (27%)
- ▶ 50% of mandates run by 3 firms (27%)

Concentration by Firm



For a full explanation of the analysis on this page please refer to page 7.

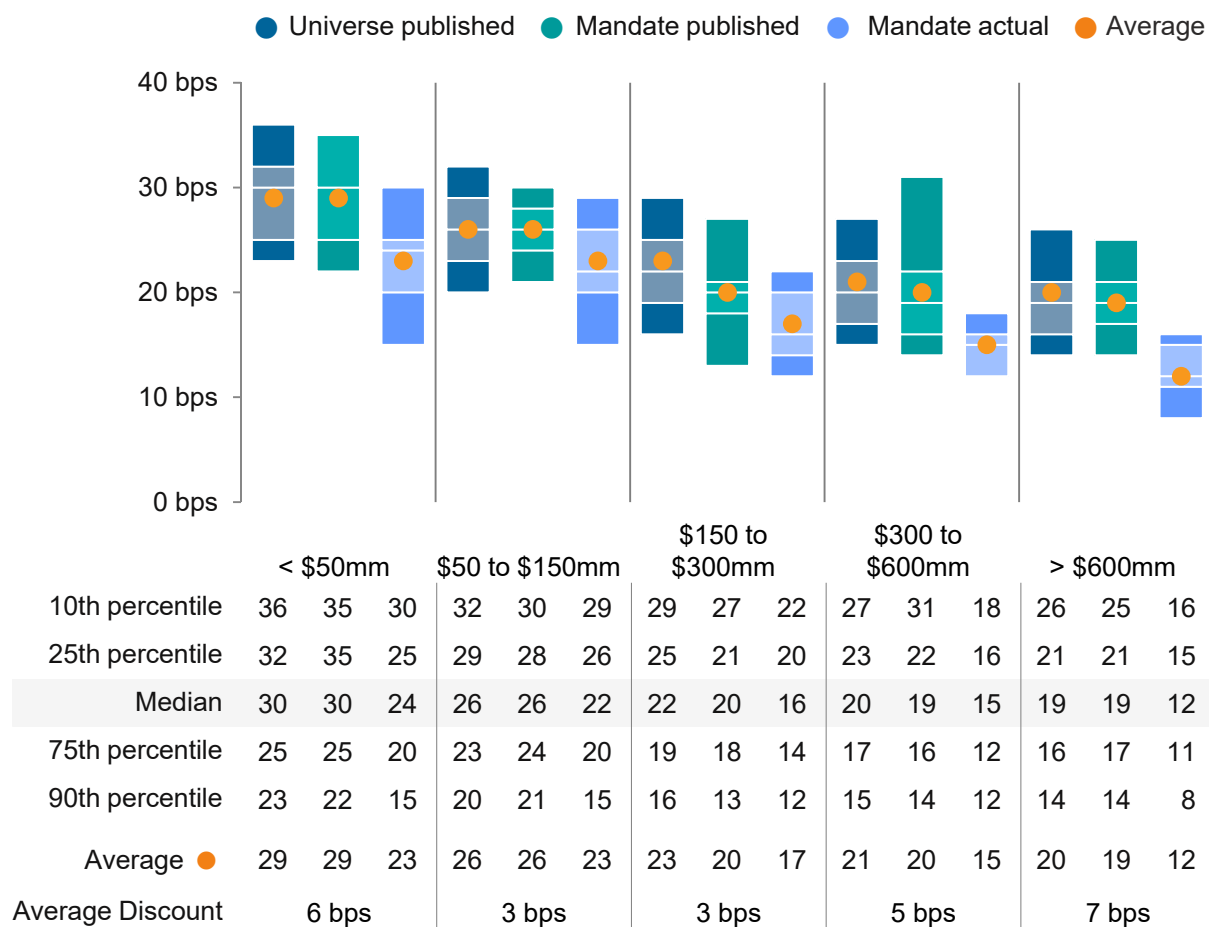
Active Fixed Income

Actual vs. Published Fees: Active Core Fixed Income

Fees by account size

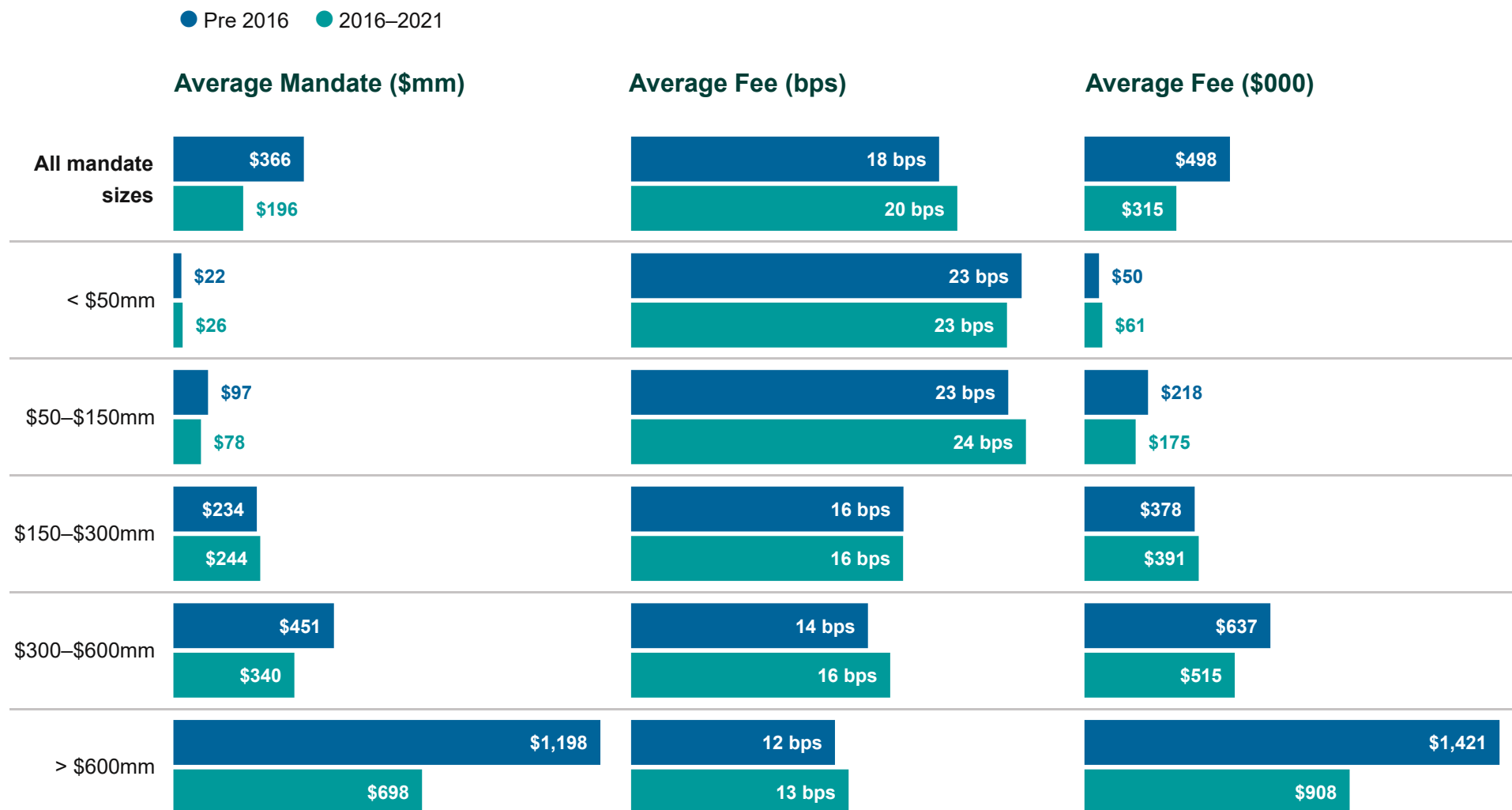
Actual Fees Paid Summary

Total AUM (\$mm)	\$38,876
Total count	121
Average AUM (\$mm)	\$321
Median AUM (\$mm)	\$169
Total average fee (bps / \$)	19 / \$451,079
Total median fee (bps / \$)	18 / \$295,500
Total sum fees (\$)	\$54,580,518
Weighted average fee	14 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Active Core Fixed Income



For a full explanation of the analysis on this page please refer to page 6.

Concentration Analysis: Active Core Fixed Income

\$38.9 billion in assets and **\$54.6** million in fees

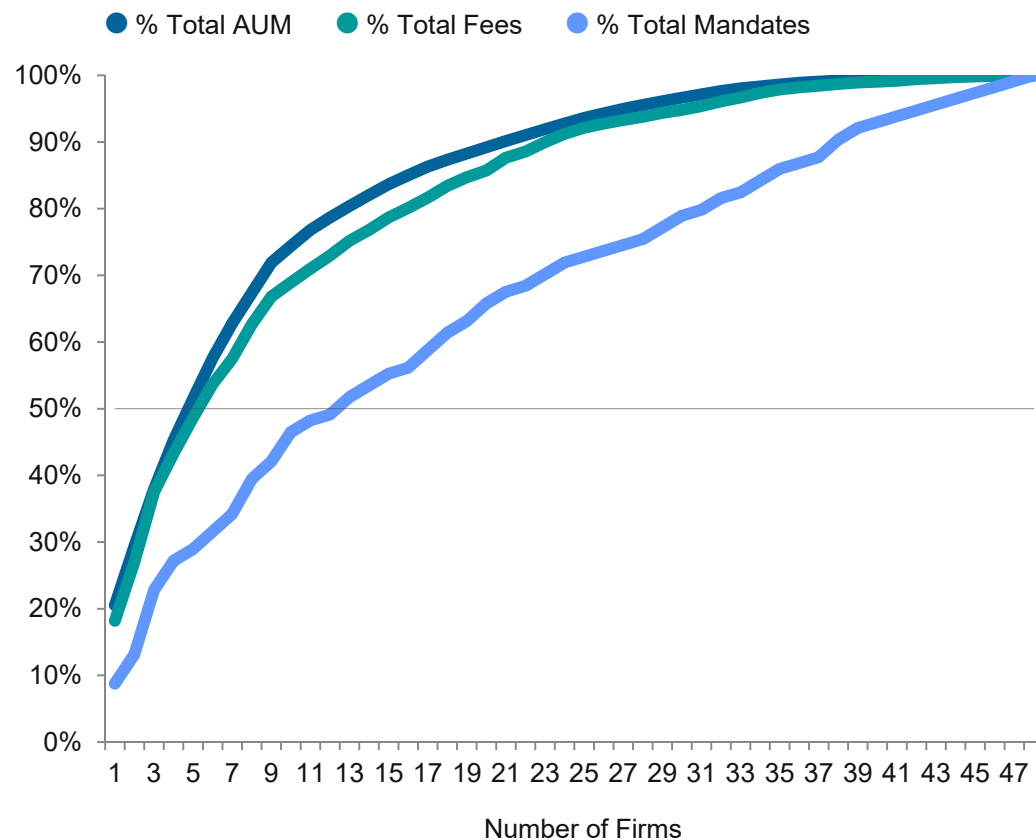
121 mandates with **48** different firms

- ▶ 50% of assets managed by 5 firms (10%)
- ▶ 50% of fees made by 6 firms (13%)
- ▶ 50% of mandates run by 13 firms (27%)

Active management has **52% AUM** (-4% from 2019 study) in this segment (48% passive)

Active management has **89% fees** (unchanged) in this segment (11% passive)

Concentration by Firm



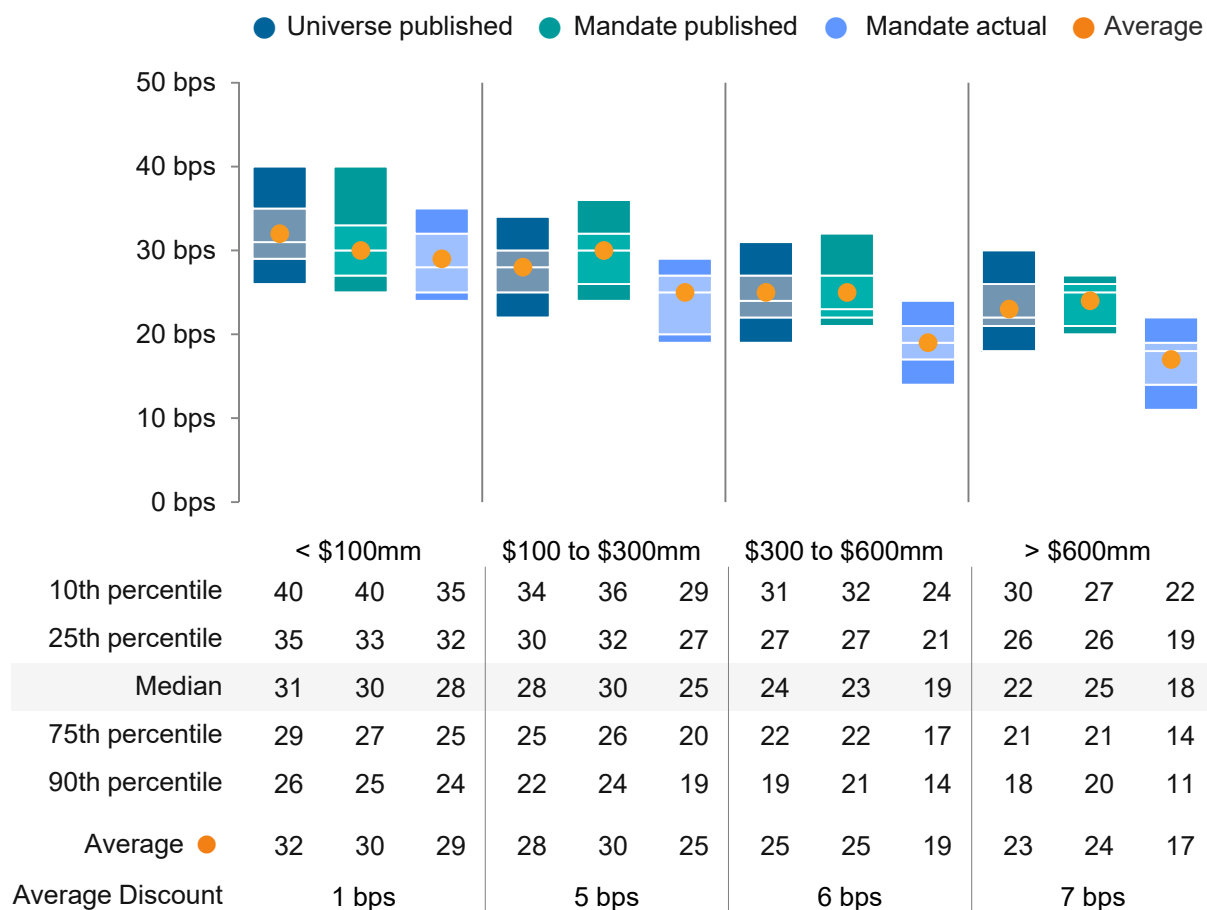
For a full explanation of the analysis on this page please refer to page 7.

Actual vs. Published Fees: Active Core Plus Fixed Income

Fees by account size

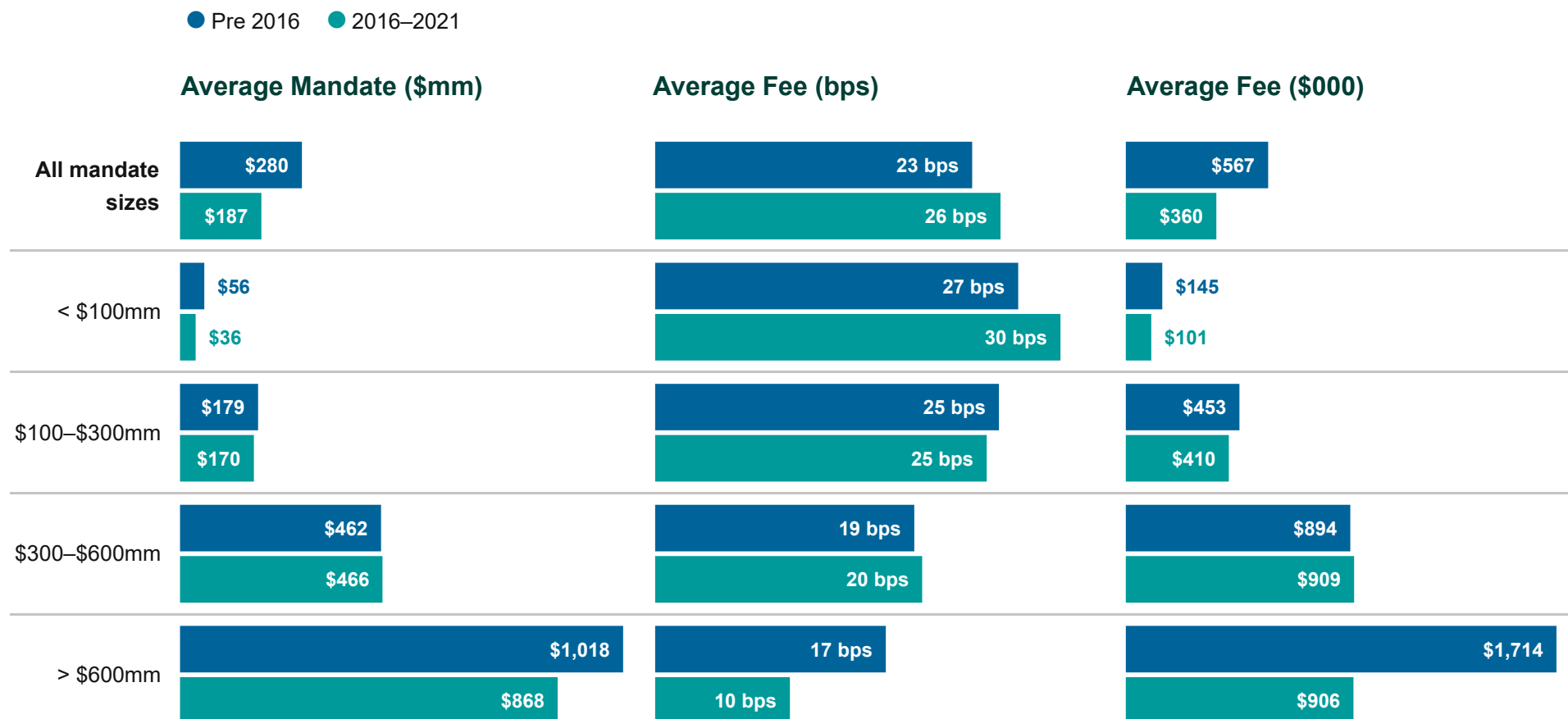
Actual Fees Paid Summary

Total AUM (\$mm)	\$22,745
Total count	83
Average AUM (\$mm)	\$274
Median AUM (\$mm)	\$140
Total average fee (bps / \$)	24 / \$538,327
Total median fee (bps / \$)	25 / \$351,000
Total sum fees (\$)	\$44,681,124
Weighted average fee	20 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Active Core Plus Fixed Income



For a full explanation of the analysis on this page please refer to page 6.

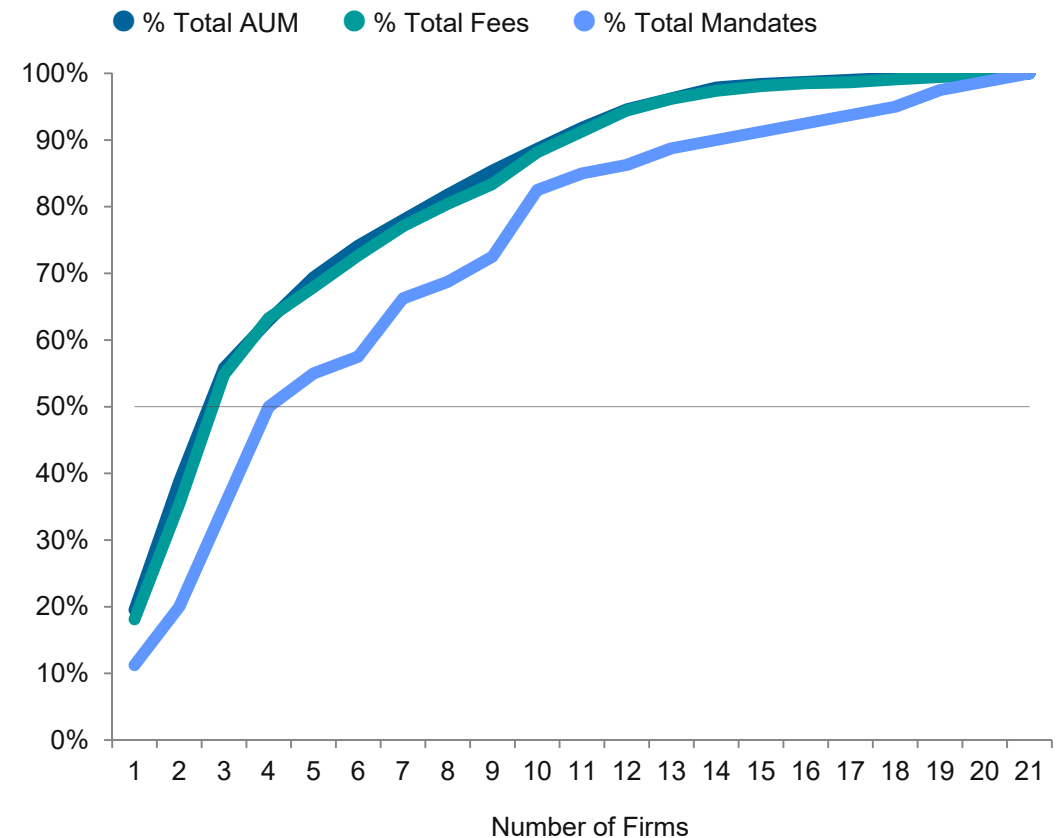
Concentration Analysis: Active Core Plus Fixed Income

\$22.7 billion in assets and **\$44.7** million in fees

83 mandates with **21** different firms

- ▶ 50% of assets managed by 3 firms (14%)
- ▶ 50% of fees made by 3 firms (14%)
- ▶ 50% of mandates run by 4 firms (19%)

Concentration by Firm



For a full explanation of the analysis on this page please refer to page 7.

Concentration Analysis: Active Core and Core Plus Fixed Income

\$61.6 billion in assets and **\$99.3 million** in fees

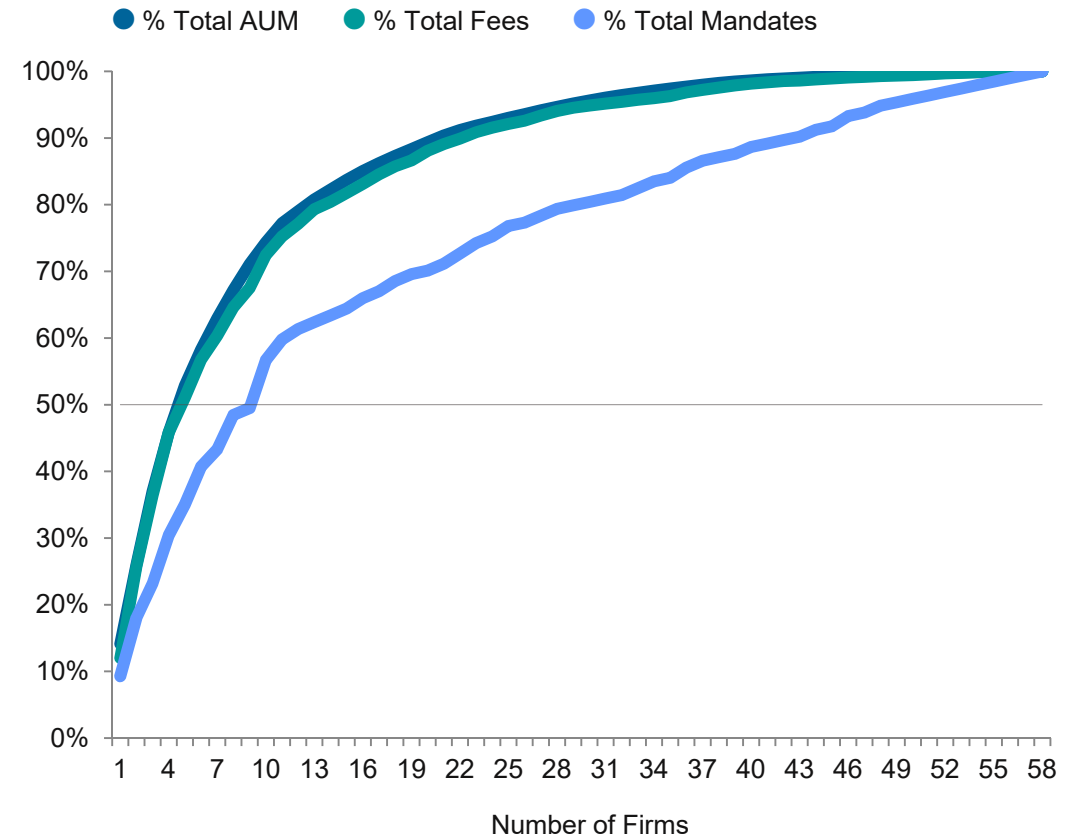
204 mandates with **58** different firms

- ▶ 50% of assets managed by 5 firms (9%)
- ▶ 50% of fees made by 5 firms (9%)
- ▶ 50% of mandates run by 10 firms (17%)

Active management has **63% AUM** (-2% from 2019 study) in these combined segments (37% passive)

Active management has **94% fees** (-2% from 2019 study) in these combined segments (6% passive)

Concentration by Firm



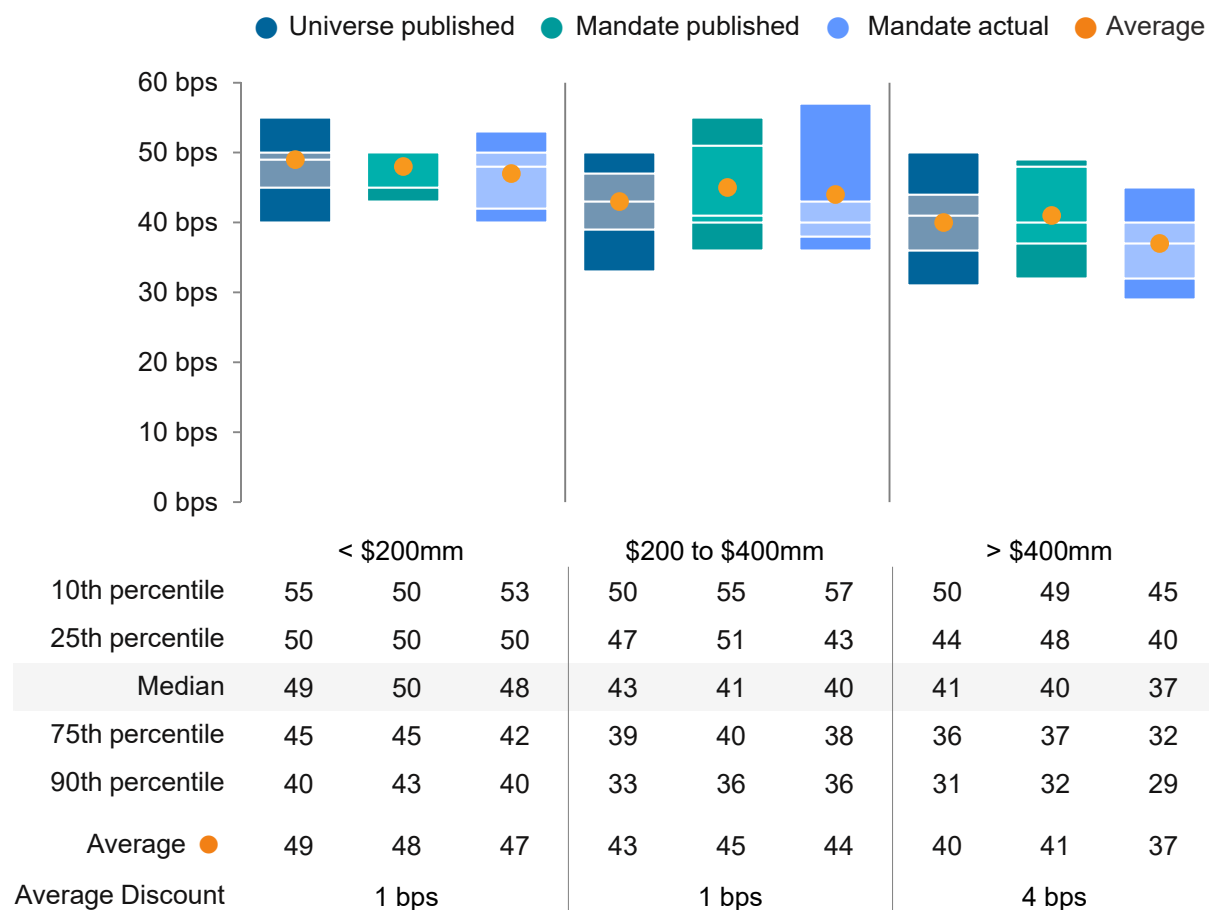
For a full explanation of the analysis on this page please refer to page 7.

Actual vs. Published Fees: Active High Yield and Bank Loan Fixed Income

Fees by account size

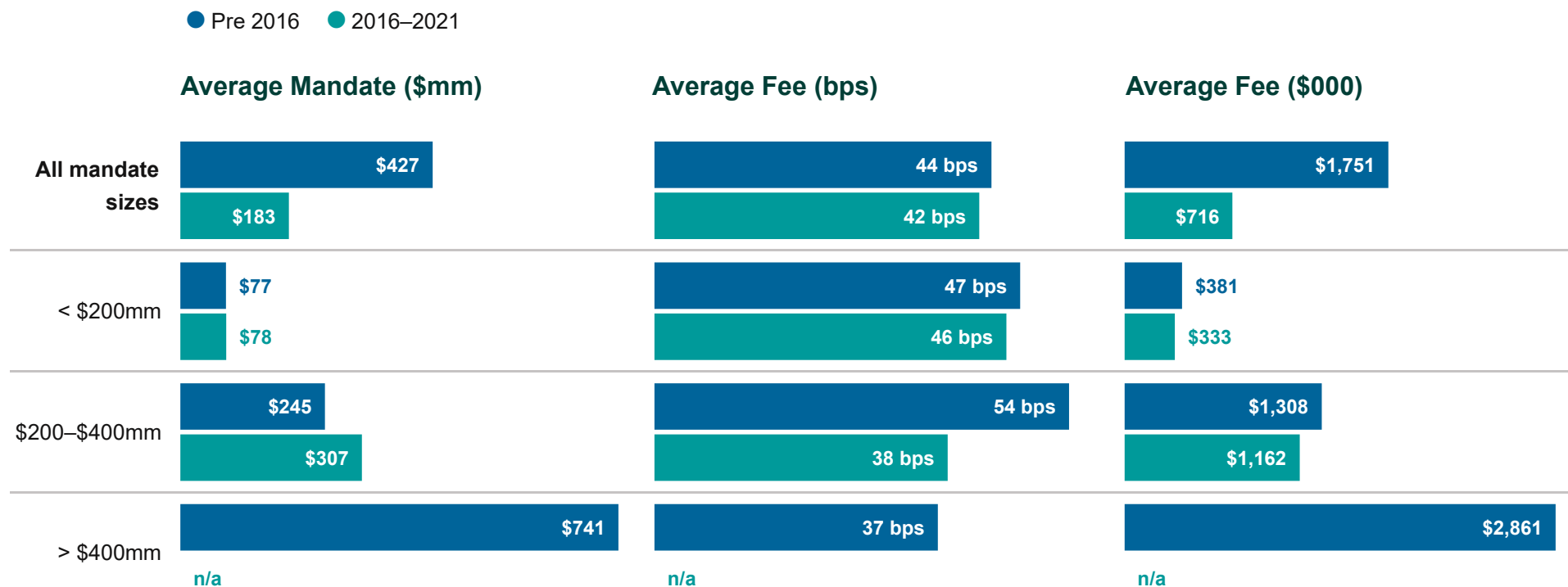
Actual Fees Paid Summary

Total AUM (\$mm)	\$10,561
Total count	33
Average AUM (\$mm)	\$320
Median AUM (\$mm)	\$226
Total average fee (bps / \$)	43 / \$1,300,227
Total median fee (bps / \$)	41 / \$993,044
Total sum fees (\$)	\$42,907,476
Weighted average fee	41 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Active High Yield and Bank Loan Fixed Income



For a full explanation of the analysis on this page please refer to page 6.

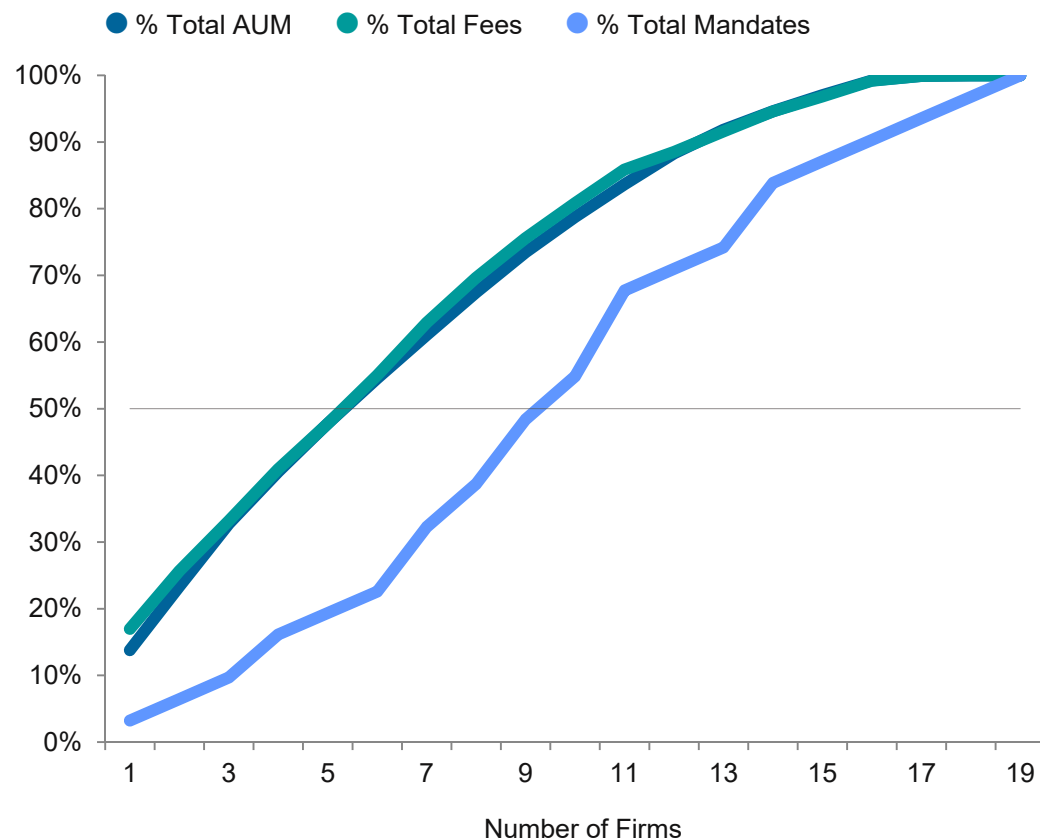
Concentration Analysis: Active High Yield and Bank Loan Fixed Income

\$10.6 billion in assets and **\$42.9 million** in fees

33 mandates with **19** different firms

- ▶ 50% of assets managed by 6 firms (32%)
- ▶ 50% of fees made by 6 firms (32%)
- ▶ 50% of mandates run by 10 firms (53%)

Concentration by Firm



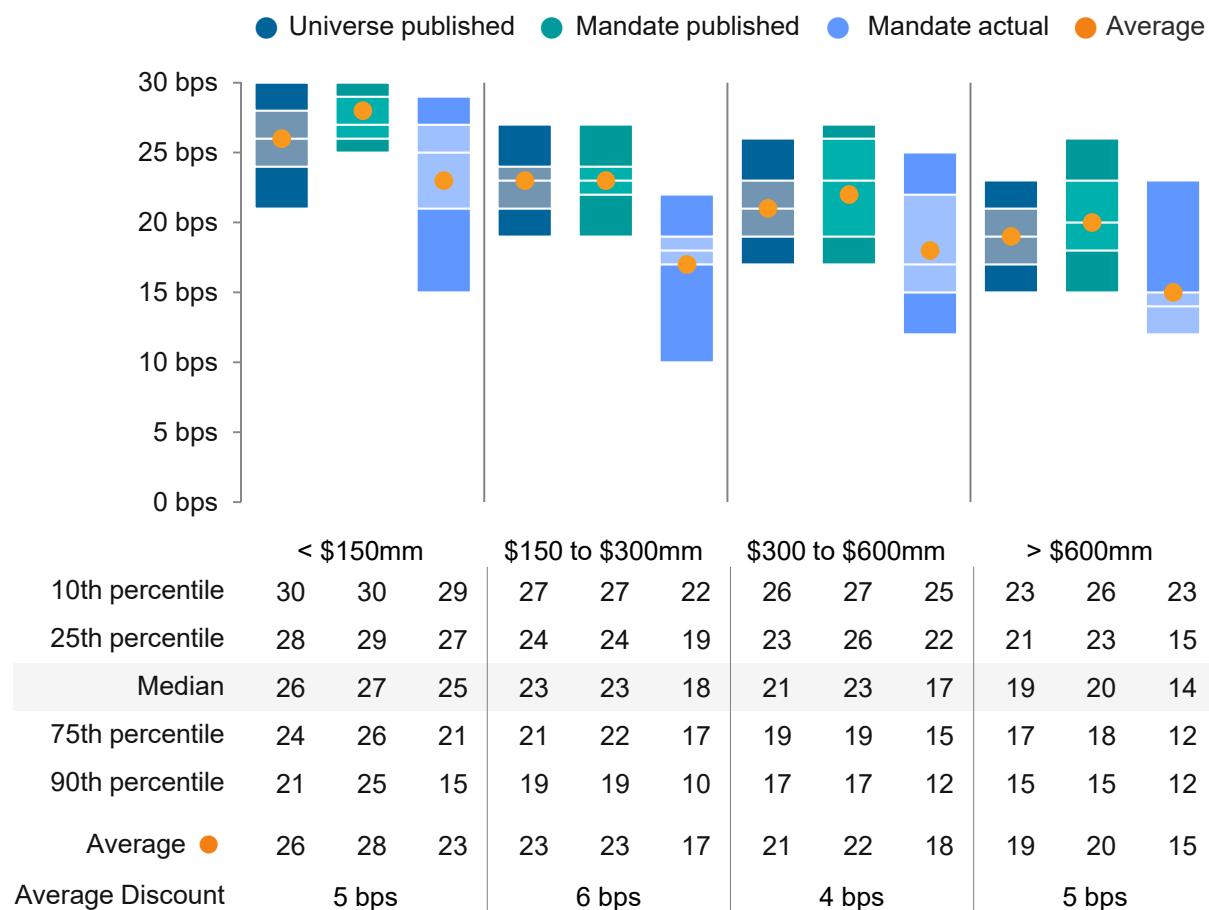
For a full explanation of the analysis on this page please refer to page 7.

Actual vs. Published Fees: Active Long Duration Fixed Income

Fees by account size

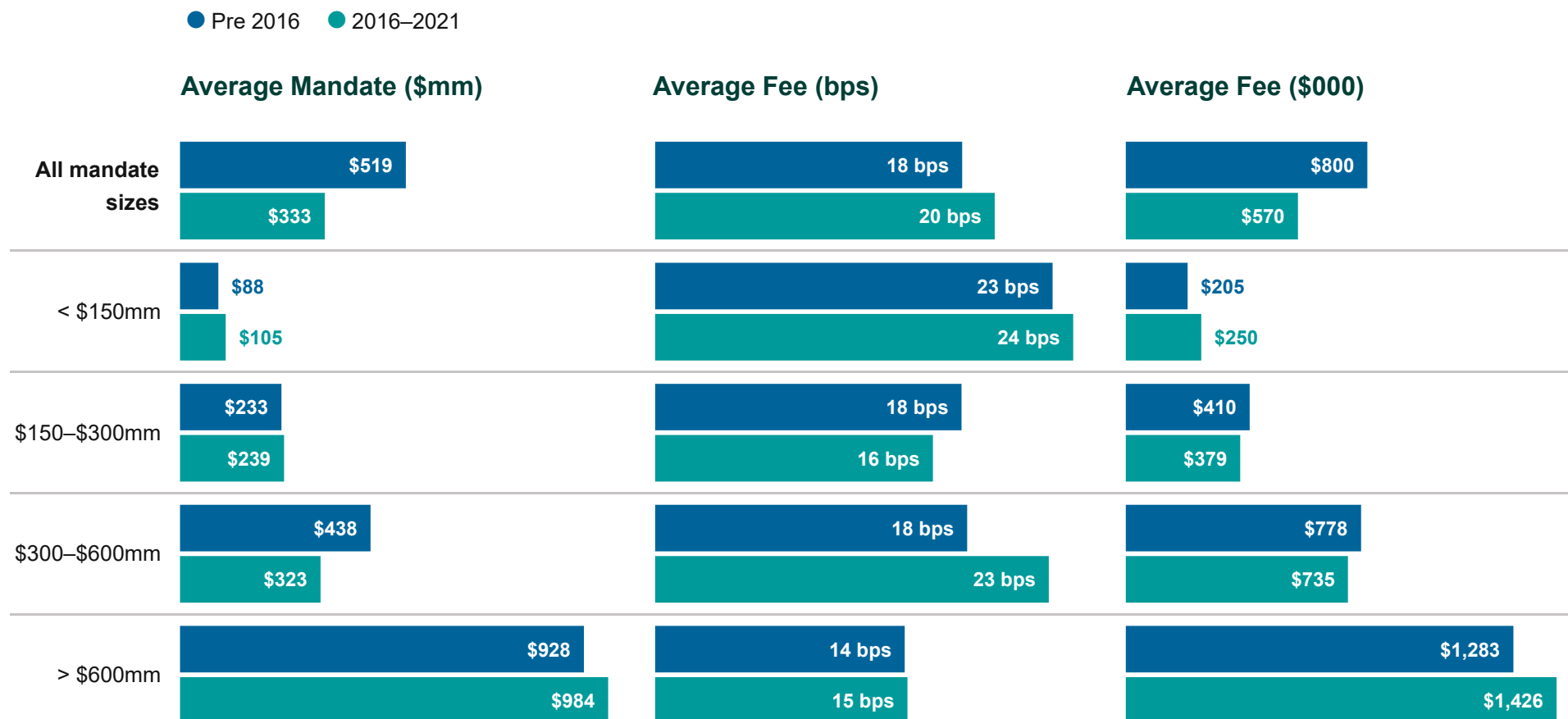
Actual Fees Paid Summary

Total AUM (\$mm)	\$30,606
Total count	65
Average AUM (\$mm)	\$471
Median AUM (\$mm)	\$373
Total average fee (bps / \$)	18 / \$746,466
Total median fee (bps / \$)	17 / \$675,816
Total sum fees (\$)	\$48,520,289
Weighted average fee	16 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Active Long Duration Fixed Income



For a full explanation of the analysis on this page please refer to page 6.

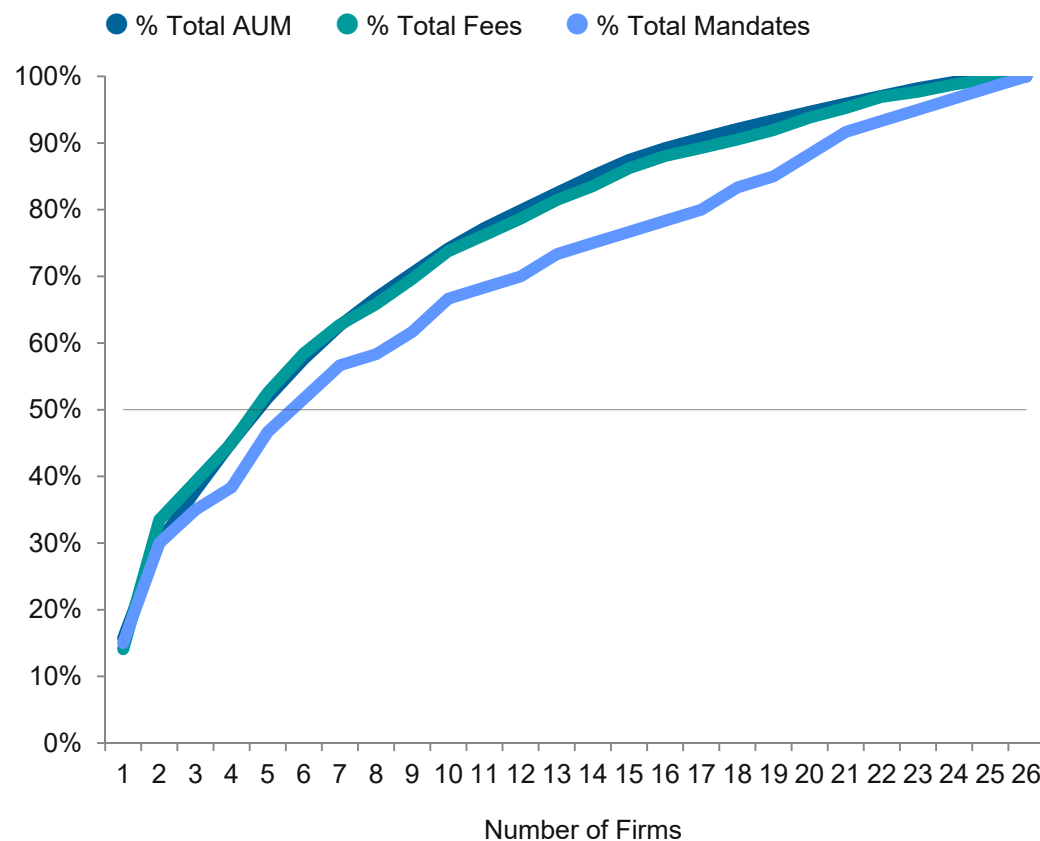
Concentration Analysis: Active Long Duration Fixed Income

\$30.6 billion in assets and **\$48.5** million in fees

65 mandates with **26** different firms

- ▶ 50% of assets managed by 5 firms (19%)
- ▶ 50% of fees made by 5 firms (19%)
- ▶ 50% of mandates run by 6 firms (23%)

Concentration by Firm



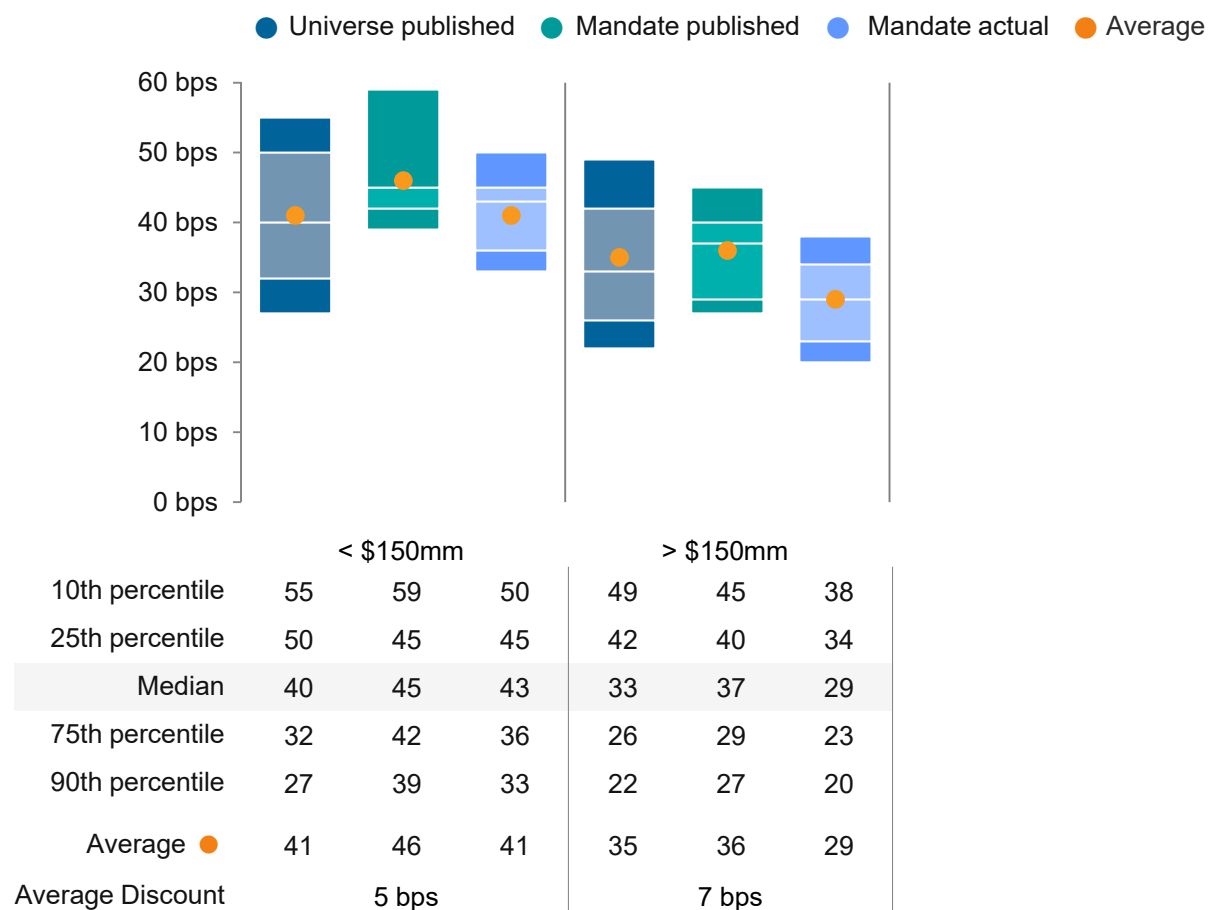
For a full explanation of the analysis on this page please refer to page 7.

Actual vs. Published Fees: Active Global Fixed Income

Fees by account size

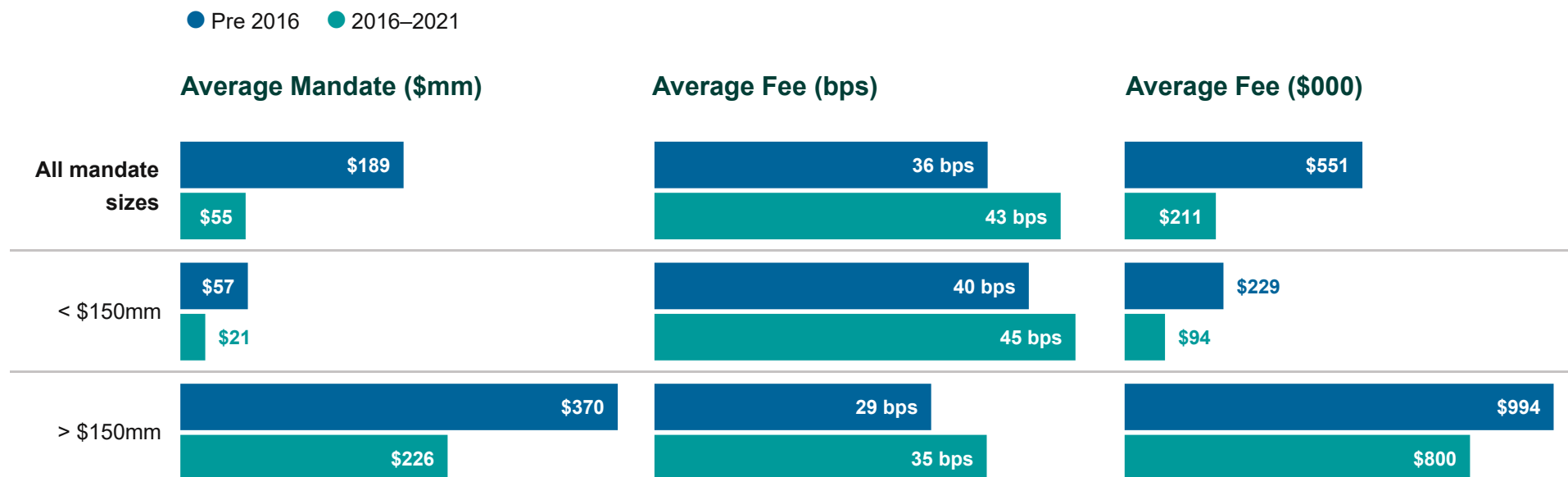
Actual Fees Paid Summary

Total AUM (\$mm)	\$4,193
Total count	26
Average AUM (\$mm)	\$161
Median AUM (\$mm)	\$76
Total average fee (bps / \$)	37 / \$467,346
Total median fee (bps / \$)	37 / \$321,150
Total sum fees (\$)	\$12,150,991
Weighted average fee	29 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Active Global Fixed Income



For a full explanation of the analysis on this page please refer to page 6.

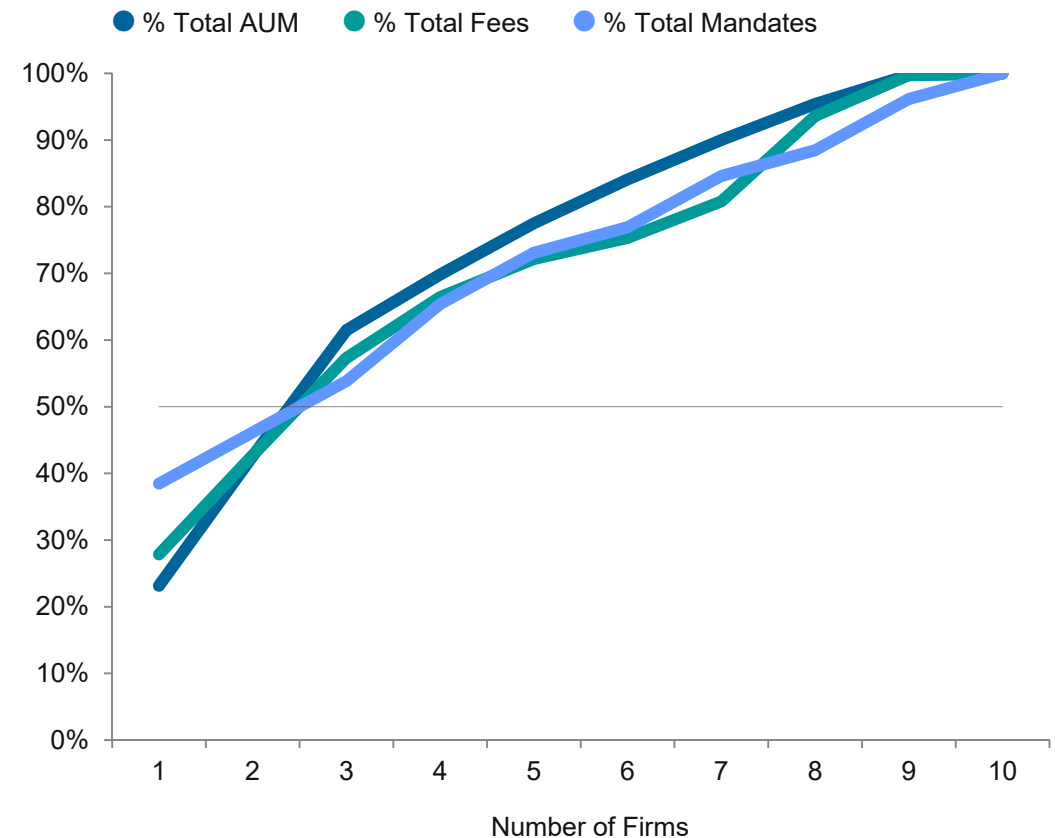
Concentration Analysis: Active Global Fixed Income

\$4.2 billion in assets and **\$12.2 million** in fees

26 mandates with **10** different firms

- ▶ 50% of assets managed by 3 firms (30%)
- ▶ 50% of fees made by 3 firms (30%)
- ▶ 50% of mandates run by 3 firms (30%)

Concentration by Firm



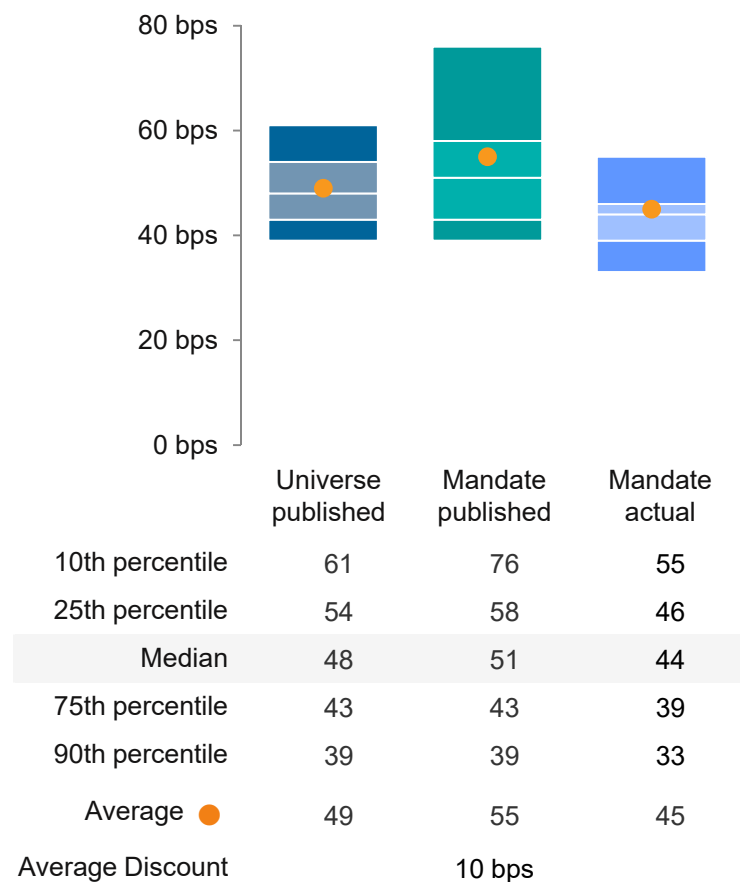
For a full explanation of the analysis on this page please refer to page 7.

Actual vs. Published Fees: Active Emerging Market Debt

Fees for all account sizes (<\$650mm, median \$203mm)

Actual Fees Paid Summary

Total AUM (\$mm)	\$3,760
Total count	13
Average AUM (\$mm)	\$289
Median AUM (\$mm)	\$203
Total average fee (bps / \$)	45 / \$1,309,903
Total median fee (bps / \$)	44 / \$939,644
Total sum fees (\$)	\$17,028,737
Weighted average fee	45 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Active Emerging Market Debt

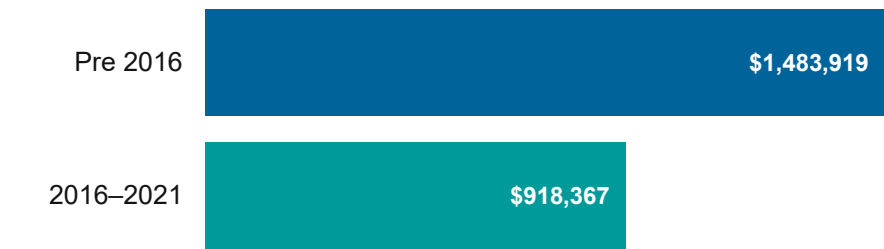
Average Mandate Size (\$mm)



Average Fee (bps)



Average Fee (\$000)



For a full explanation of the analysis on this page please refer to page 6.

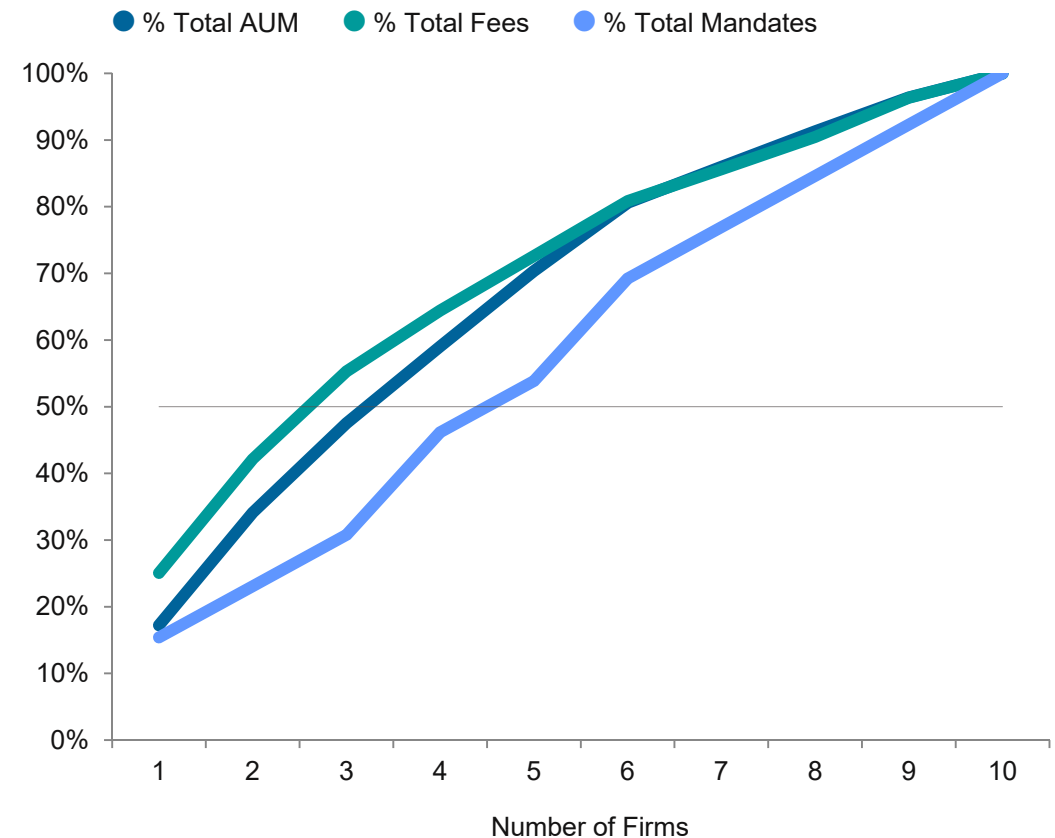
Concentration Analysis: Active Emerging Market Debt

\$3.8 billion in assets and **\$17.0 million** in fees

13 mandates with **10** different firms

- ▶ 50% of assets managed by 4 firms (40%)
- ▶ 50% of fees made by 3 firms (30%)
- ▶ 50% of mandates run by 5 firms (50%)

Concentration by Firm



For a full explanation of the analysis on this page please refer to page 7.

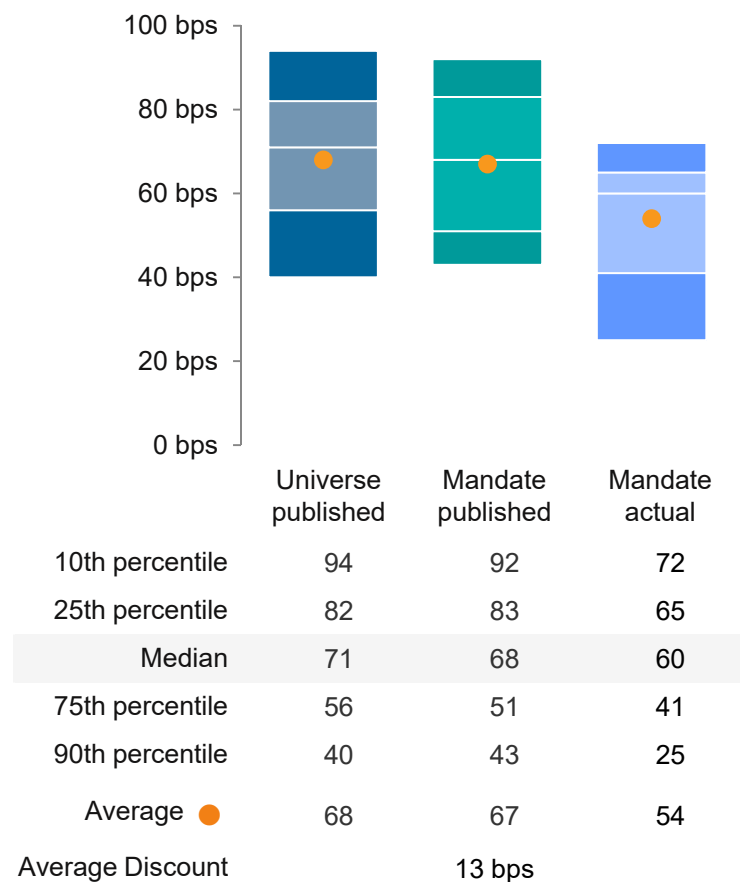
Alternatives

Actual vs. Published Fees: Active Multi-Asset Class (MACs)

Fees for all account sizes (<\$600mm, median \$47mm)

Actual Fees Paid Summary

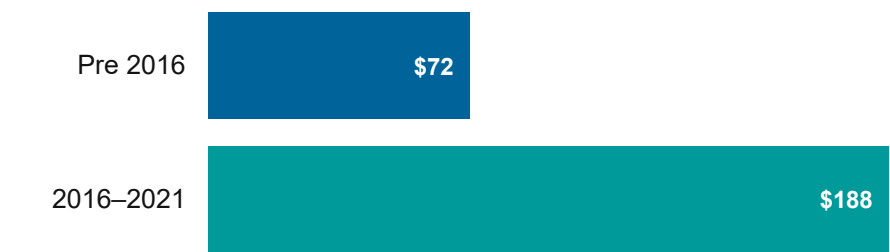
Total AUM (\$mm)	\$2,272
Total count	17
Average AUM (\$mm)	\$134
Median AUM (\$mm)	\$47
Total average fee (bps / \$)	54 / \$481,544
Total median fee (bps / \$)	60 / \$214,995
Total sum fees (\$)	\$8,186,254
Weighted average fee	36 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Active Multi-Asset Class (MACs)

Average Mandate Size (\$mm)



Average Fee (bps)



Average Fee (\$000)



For a full explanation of the analysis on this page please refer to page 6.

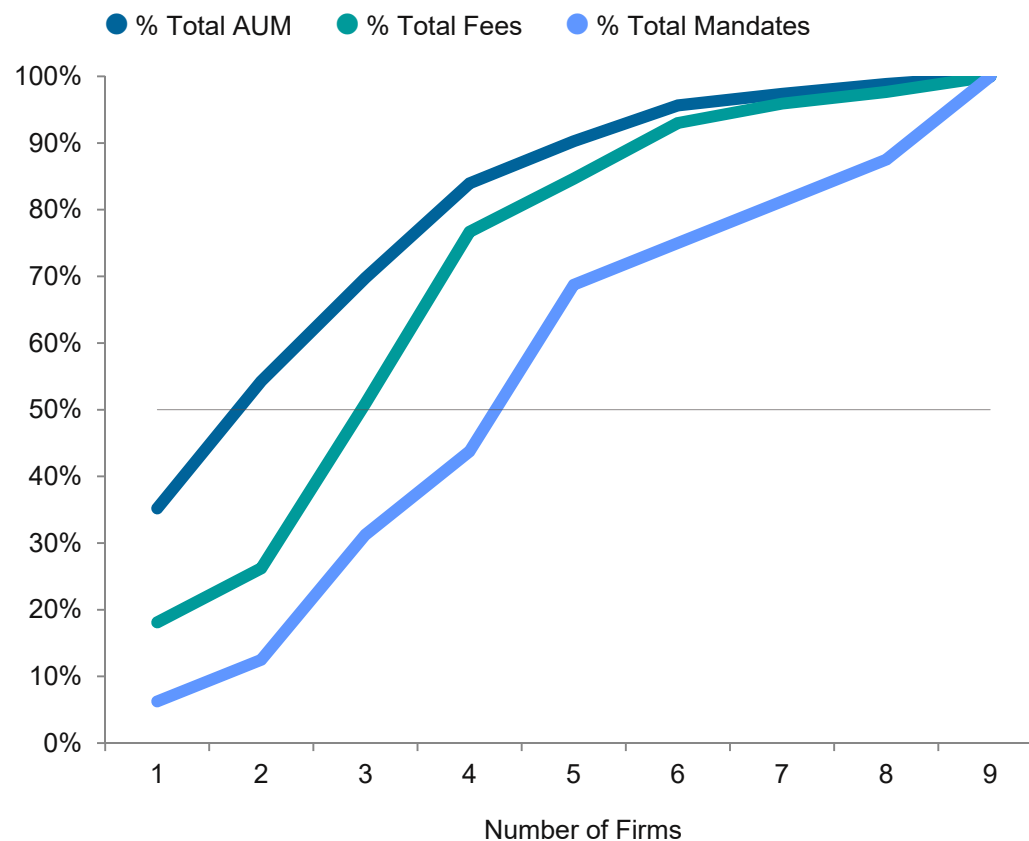
Concentration Analysis: Active Multi-Asset Class (MACs)

\$2.3 billion in assets and **\$8.2 million** in fees

17 mandates with **9** different firms

- ▶ 50% of assets managed by 2 firms (22%)
- ▶ 50% of fees made by 3 firms (33%)
- ▶ 50% of mandates run by 5 firms (56%)

Concentration by Firm

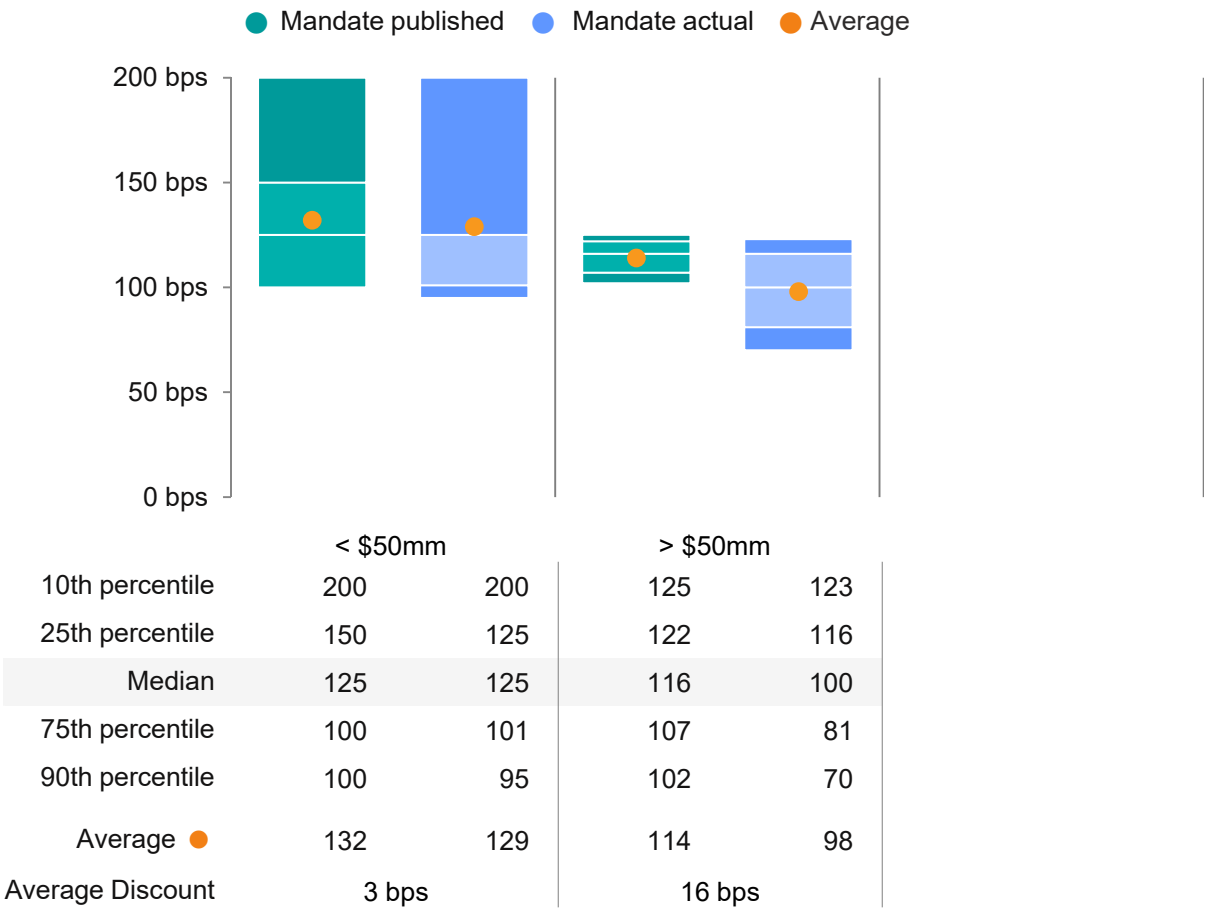


For a full explanation of the analysis on this page please refer to page 7.

Actual vs. Published Fees: Hedge Fund-of-Funds

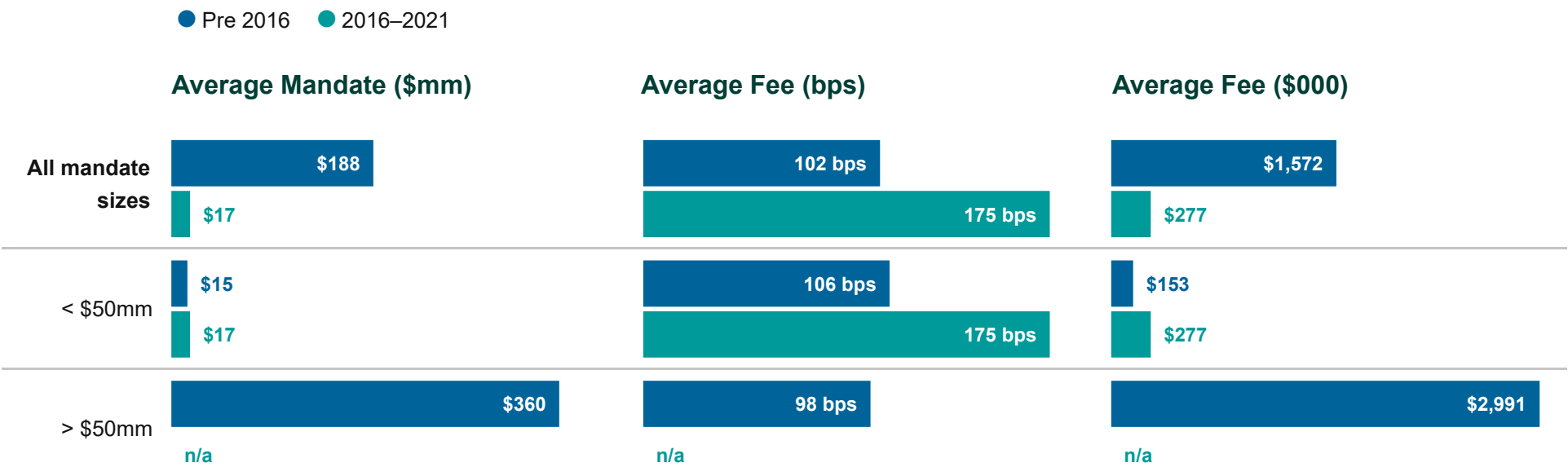
Actual Fees Paid Summary	
Total AUM (\$mm)	\$2,303
Total count	15
Average AUM (\$mm)	\$154
Median AUM (\$mm)	\$25
Total average fee (bps / \$)	117 / \$1,313,110
Total median fee (bps / \$)	110 / \$260,000
Total sum fees (\$)	\$19,696,646
Weighted average fee	86 bps

Fees by account size



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Hedge Fund-of-Funds



For a full explanation of the analysis on this page please refer to page 6.

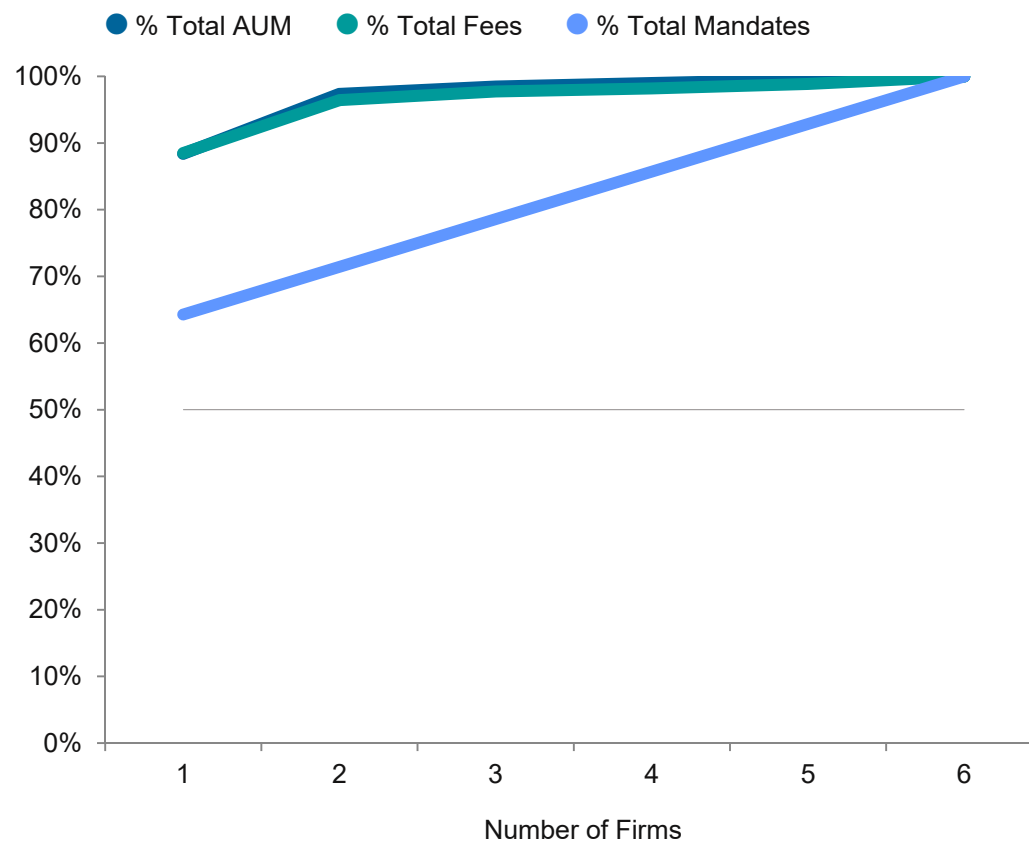
Concentration Analysis: Hedge Fund-of-Funds

\$2.3 billion in assets and **\$19.7 million** in fees

15 mandates with **6** different firms

- ▶ 50% of assets managed by 1 firm (17%)
- ▶ 50% of fees made by 1 firm (17%)
- ▶ 50% of mandates run by 1 firm (17%)

Concentration by Firm

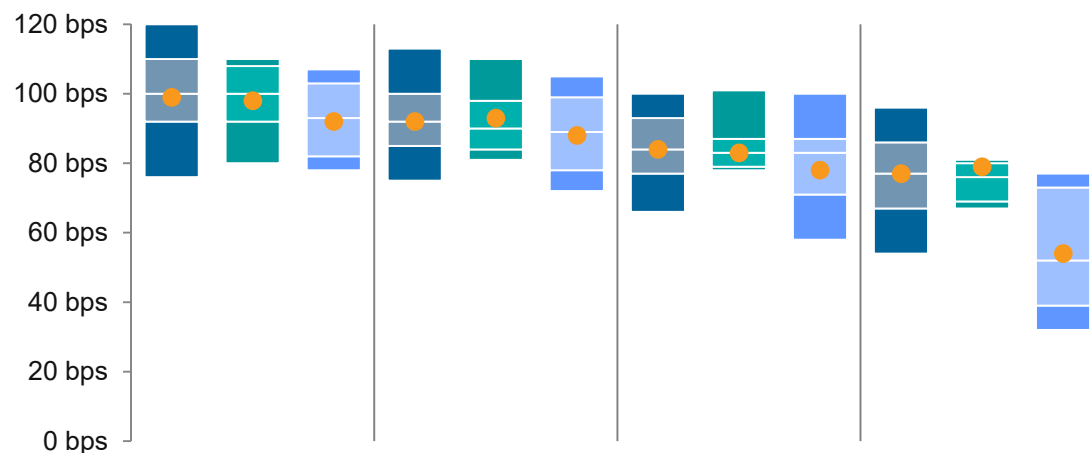


For a full explanation of the analysis on this page please refer to page 7.

Actual vs. Published Fees: Private Open-Ended Real Assets

Fees by account size

● Universe published ● Mandate published ● Mandate actual ● Average

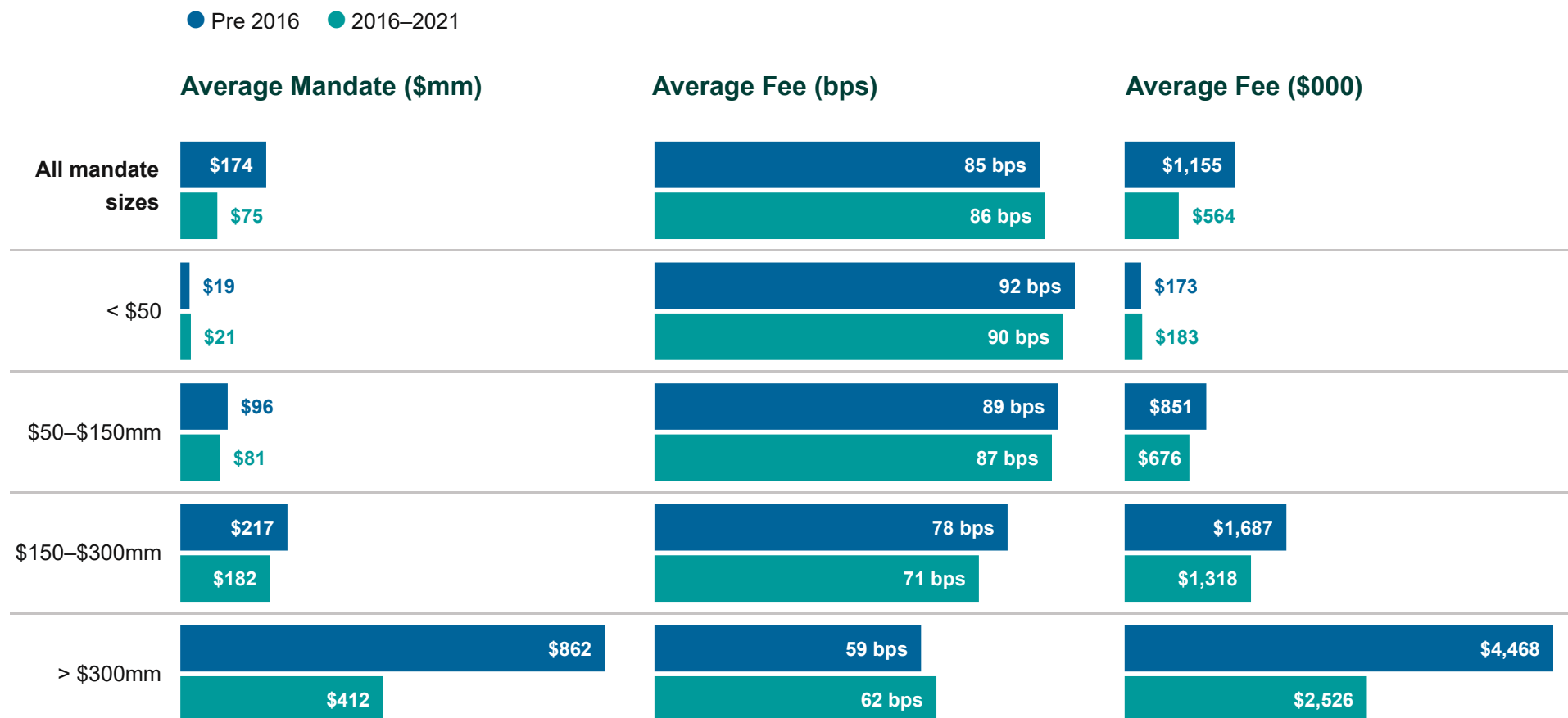


	< \$50mm			\$50 to \$150mm			\$150 to \$300mm			> \$300mm		
10th percentile	120	110	107	113	110	105	100	101	100	96	81	77
25th percentile	110	108	103	100	98	99	93	87	87	86	80	73
Median	100	100	93	92	90	89	84	83	83	77	76	52
75th percentile	92	92	82	85	84	78	77	79	71	67	69	39
90th percentile	76	80	78	75	81	72	66	78	58	54	67	32
Average ●	99	98	92	92	93	88	84	83	78	77	79	54
Average Discount	6 bps			5 bps			5 bps			25 bps		

Actual Fees Paid Summary	
Total AUM (\$mm)	\$25,038
Total count	154
Average AUM (\$mm)	\$163
Median AUM (\$mm)	\$65
Total average fee (bps / \$)	84 / \$1,040,769
Total median fee (bps / \$)	85 / \$611,000
Total sum fees (\$)	\$160,278,406
Weighted average fee	64 bps

For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Private Open-Ended Real Assets



For a full explanation of the analysis on this page please refer to page 6.

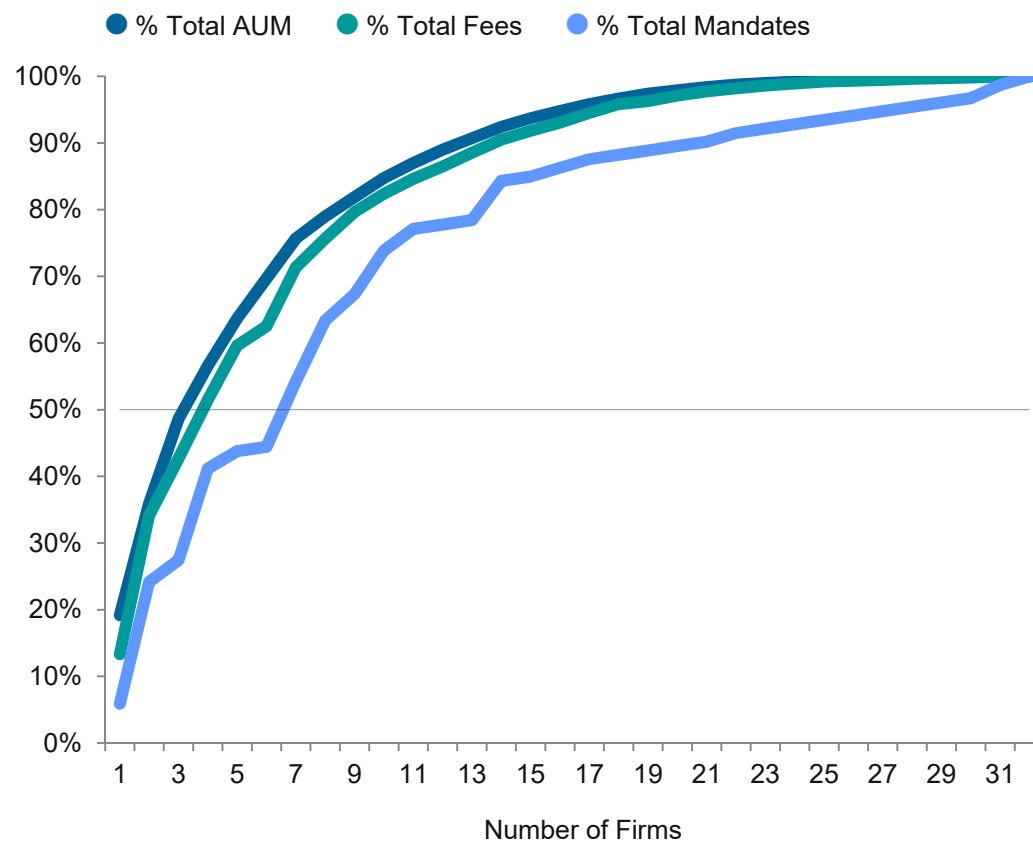
Concentration Analysis: Private Open-Ended Real Assets

\$25.0 billion in assets and **\$160.3** million in fees

154 mandates with **32** different firms

- ▶ 50% of assets managed by 4 firms (13%)
- ▶ 50% of fees made by 4 firms (13%)
- ▶ 50% of mandates run by 7 firms (22%)

Concentration by Firm



For a full explanation of the analysis on this page please refer to page 7.

Passive

Actual vs. Published Fees: Passive U.S. Large Cap and All Cap Equity

Fees by account size

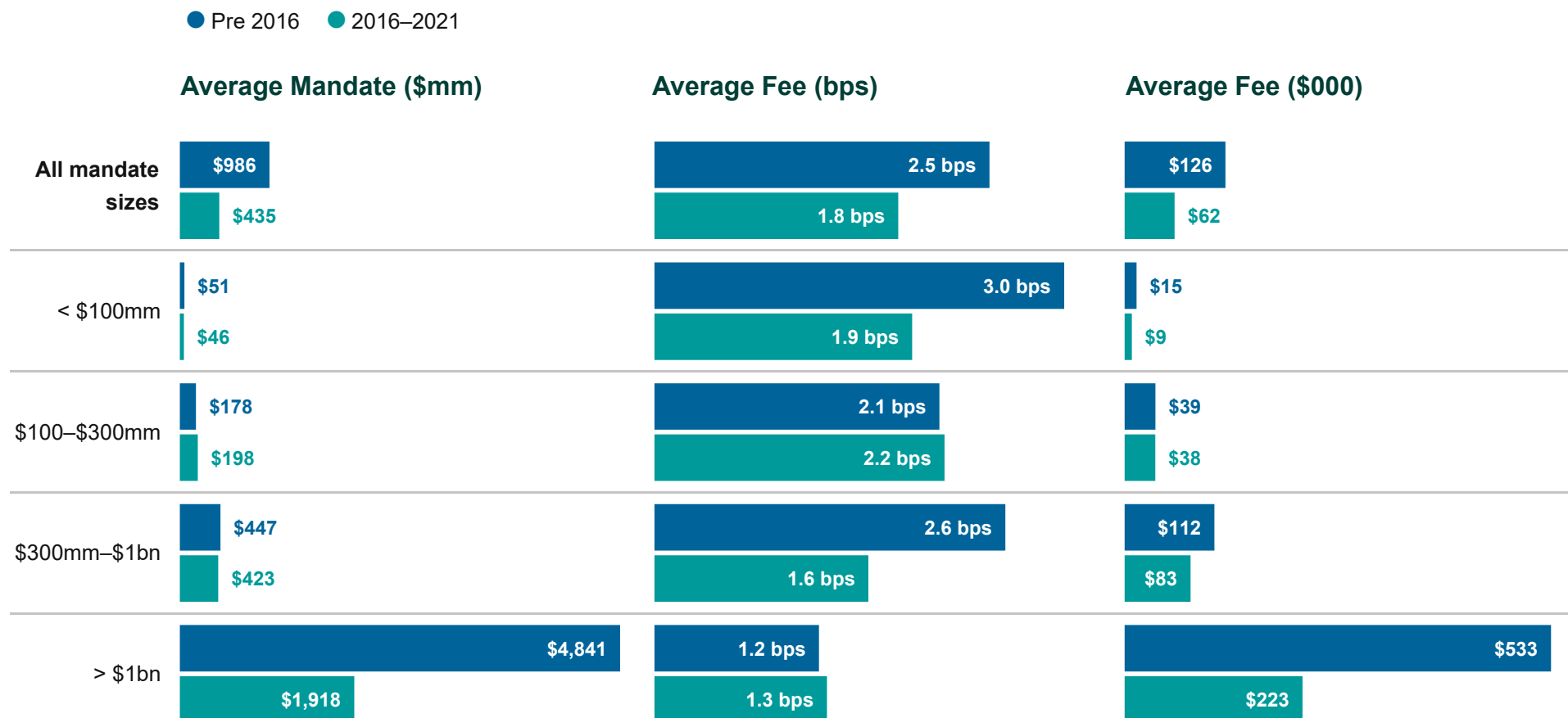
Actual Fees Paid Summary

Total AUM (\$mm)	\$110,397
Total count	127
Average AUM (\$mm)	\$869
Median AUM (\$mm)	\$143
Total average fee (bps / \$)	2 / \$104,255
Total median fee (bps / \$)	2 / \$29,400
Total sum fees (\$)	\$13,240,382
Weighted average fee	1.2 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Passive U.S. Large Cap and All Cap Equity



For a full explanation of the analysis on this page please refer to page 6.

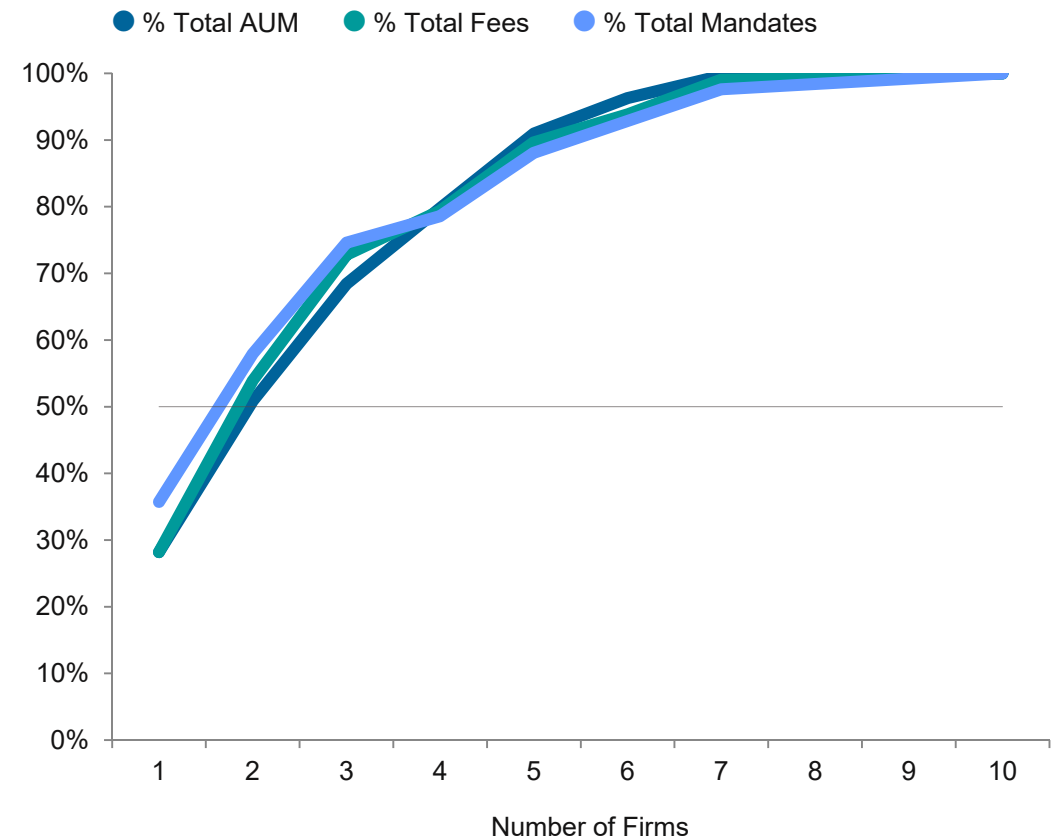
Concentration Analysis: Passive U.S. Large Cap and All Cap Equity

\$110.4 billion in assets and **\$13.2** million in fees

127 mandates with **10** different firms

- ▶ 50% of assets managed by 2 firms (20%)
- ▶ 50% of fees made by 2 firms (20%)
- ▶ 50% of mandates run by 2 firms (20%)

Concentration by Firm



For a full explanation of the analysis on this page please refer to page 7.

Actual vs. Published Fees: Passive U.S. Smid, Small, and Micro Cap Equity

Fees by account size

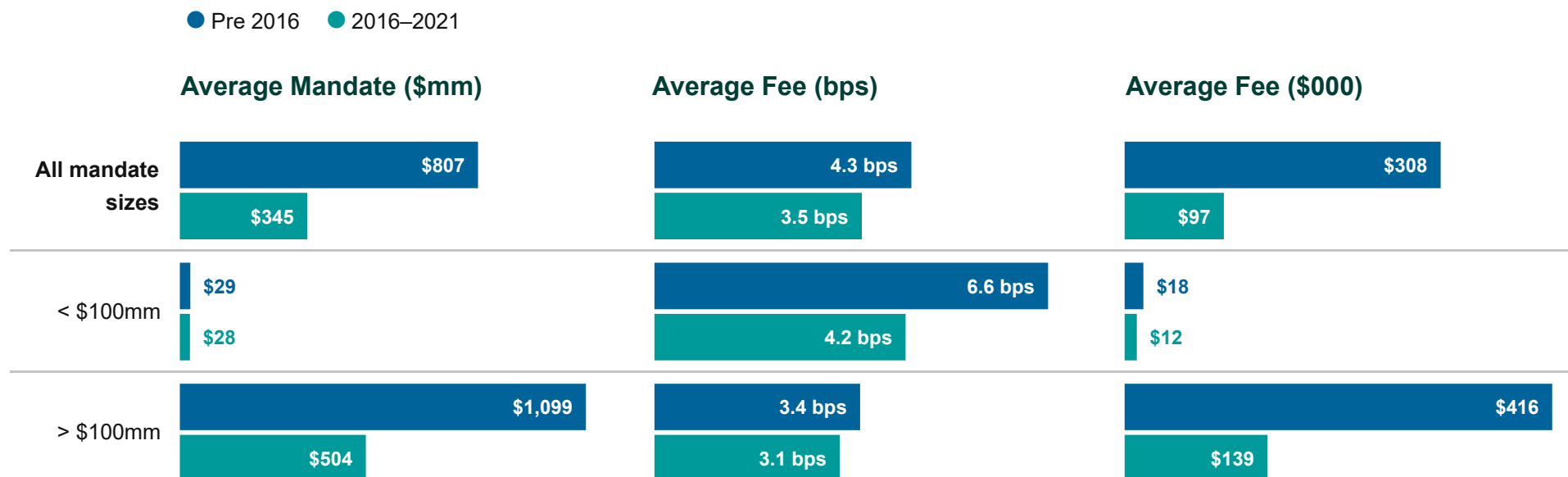
Actual Fees Paid Summary

Total AUM (\$mm)	\$13,019
Total count	23
Average AUM (\$mm)	\$566
Median AUM (\$mm)	\$179
Total average fee (bps / \$)	4 / \$197,475
Total median fee (bps / \$)	4 / \$71,600
Total sum fees (\$)	\$4,541,925
Weighted average fee	3.5 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Passive U.S. Smid, Small, and Micro Cap Equity



For a full explanation of the analysis on this page please refer to page 6.

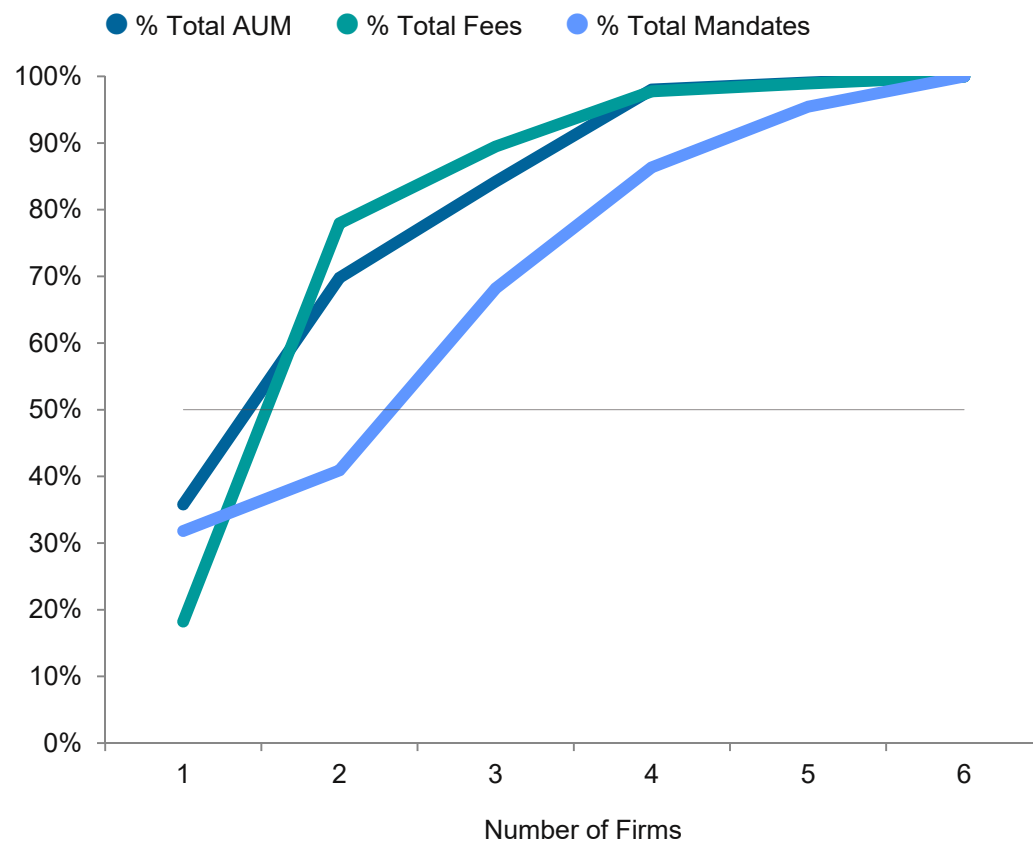
Concentration Analysis: Passive U.S. Smid, Small, and Micro Cap Equity

\$13.0 billion in assets and **\$4.5** million in fees

23 mandates with **6** different firms

- ▶ 50% of assets managed by 2 firms (33%)
- ▶ 50% of fees made by 2 firms (33%)
- ▶ 50% of mandates run by 3 firms (50%)

Concentration by Firm



For a full explanation of the analysis on this page please refer to pages 8.

Actual vs. Published Fees: Passive Global ex-U.S. Large Cap Equity

Fees by account size

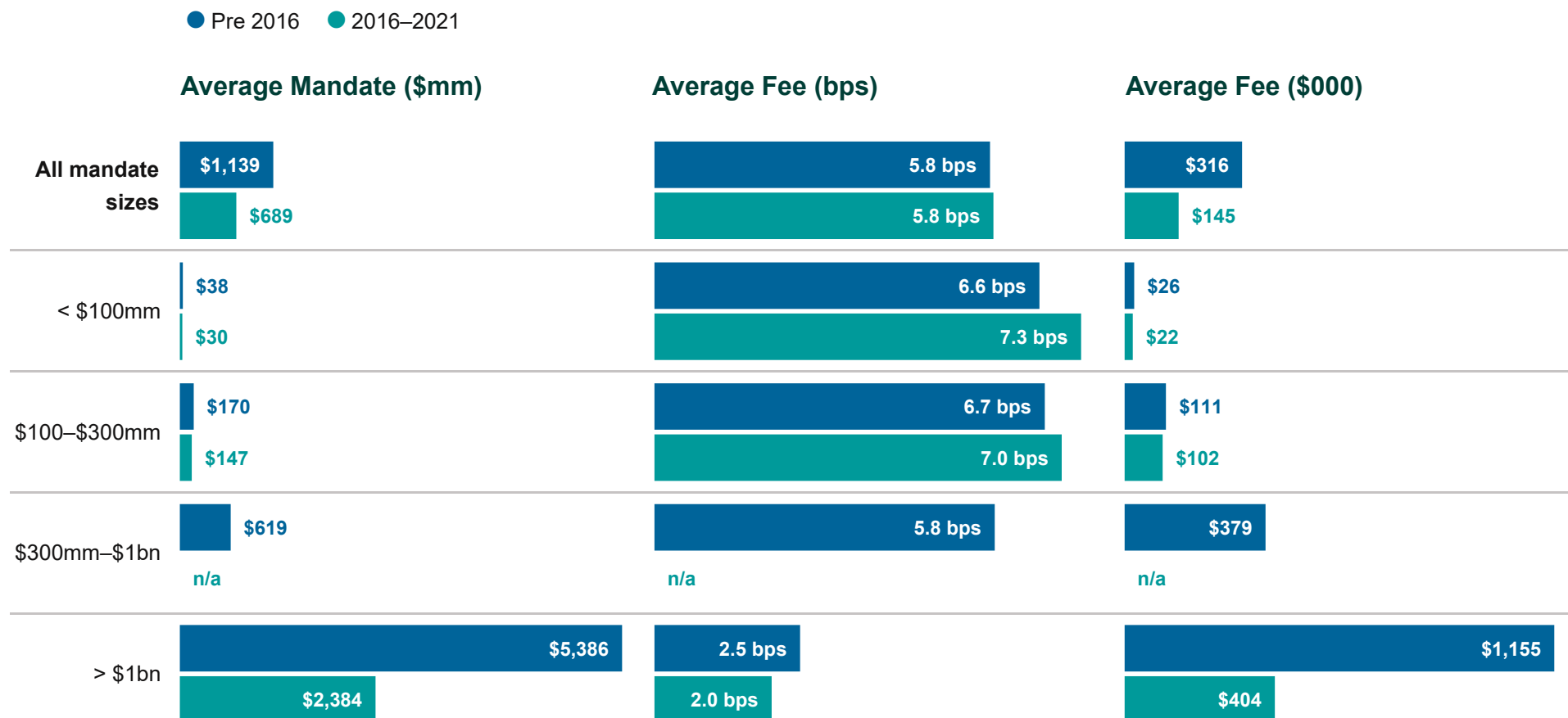
Actual Fees Paid Summary

Total AUM (\$mm)	\$54,967
Total count	56
Average AUM (\$mm)	\$982
Median AUM (\$mm)	\$154
Total average fee (bps / \$)	6 / \$259,627
Total median fee (bps / \$)	6 / \$86,556
Total sum fees (\$)	\$14,539,110
Weighted average fee	2.6 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Passive Global ex-U.S. Large Cap Equity



For a full explanation of the analysis on this page please refer to page 6.

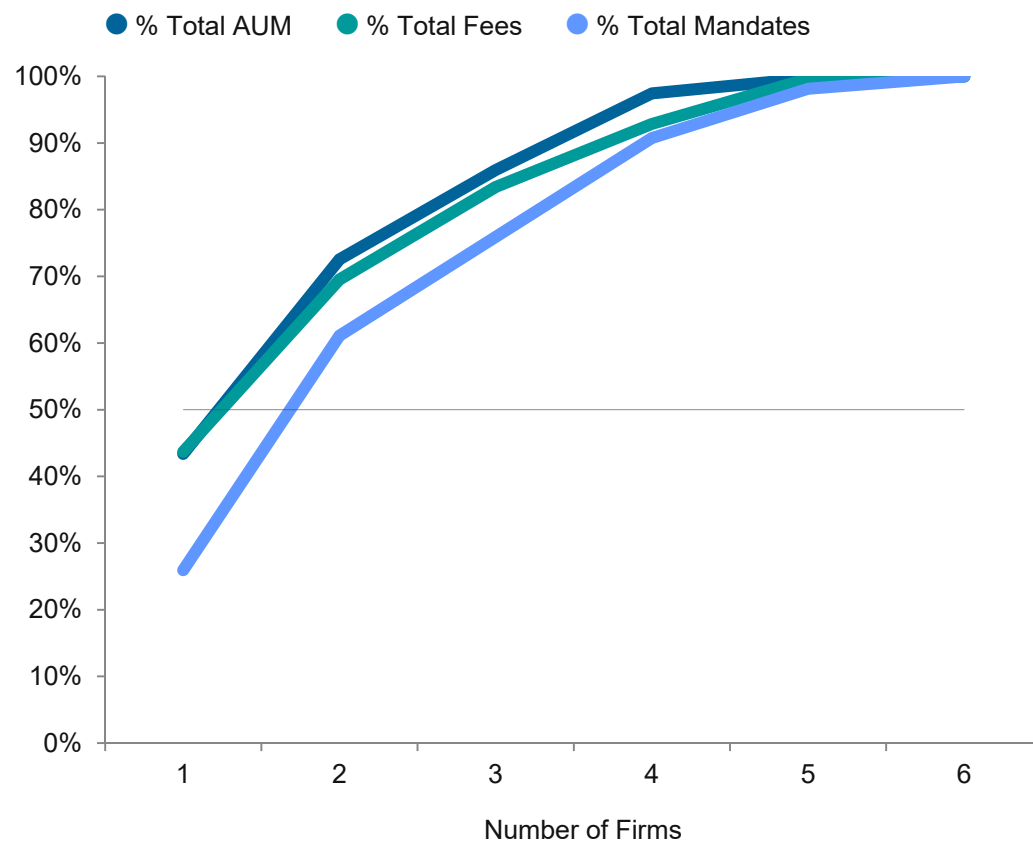
Concentration Analysis: Passive Global ex-U.S. Large Cap Equity

\$55.0 billion in assets and **\$14.5** million in fees

56 mandates with **6** different firms

- ▶ 50% of assets managed by 2 firms (33%)
- ▶ 50% of fees made by 2 firms (33%)
- ▶ 50% of mandates run by 2 firms (33%)

Concentration by Firm



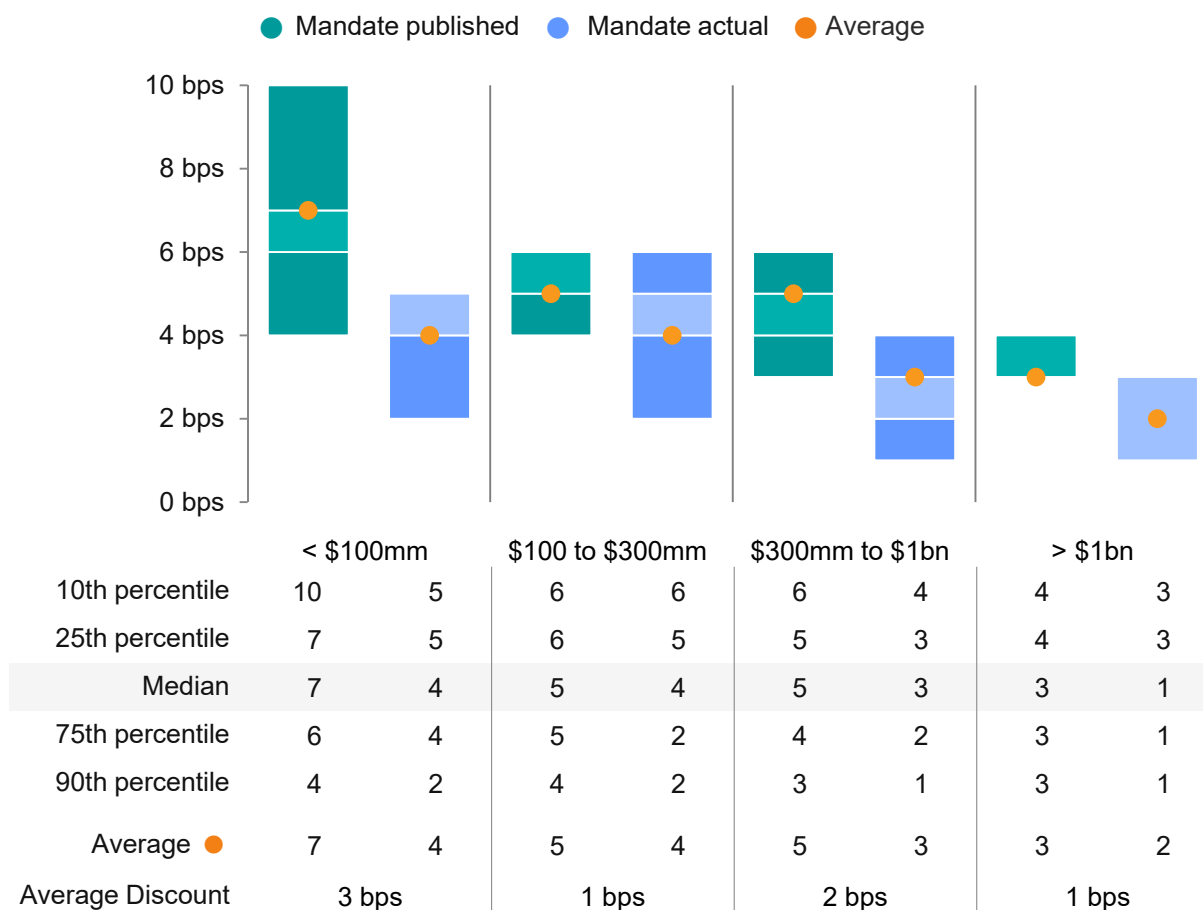
For a full explanation of the analysis on this page please refer to pages 8.

Actual vs. Published Fees: Passive U.S. Core Fixed Income

Fees by account size

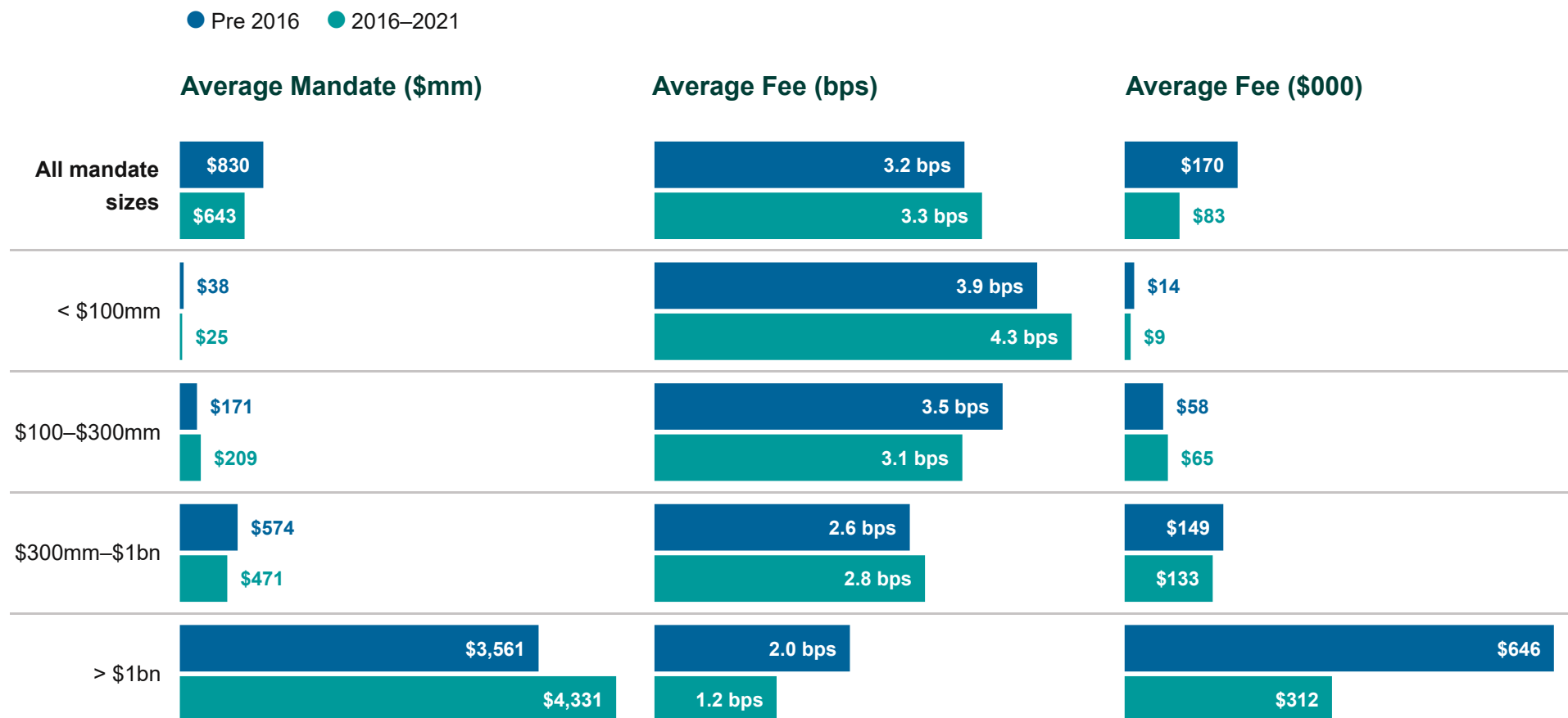
Actual Fees Paid Summary

Total AUM (\$mm)	\$35,847
Total count	49
Average AUM (\$mm)	\$732
Median AUM (\$mm)	\$204
Total average fee (bps / \$)	3 / \$135,556
Total median fee (bps / \$)	4 / \$48,705
Total sum fees (\$)	\$6,642,226
Weighted average fee	1.9 bps



For a full explanation of the analysis on this page please refer to pages 4 and 5.

Vintage Fee Analysis: Passive U.S. Core Fixed Income



For a full explanation of the analysis on this page please refer to page 6.

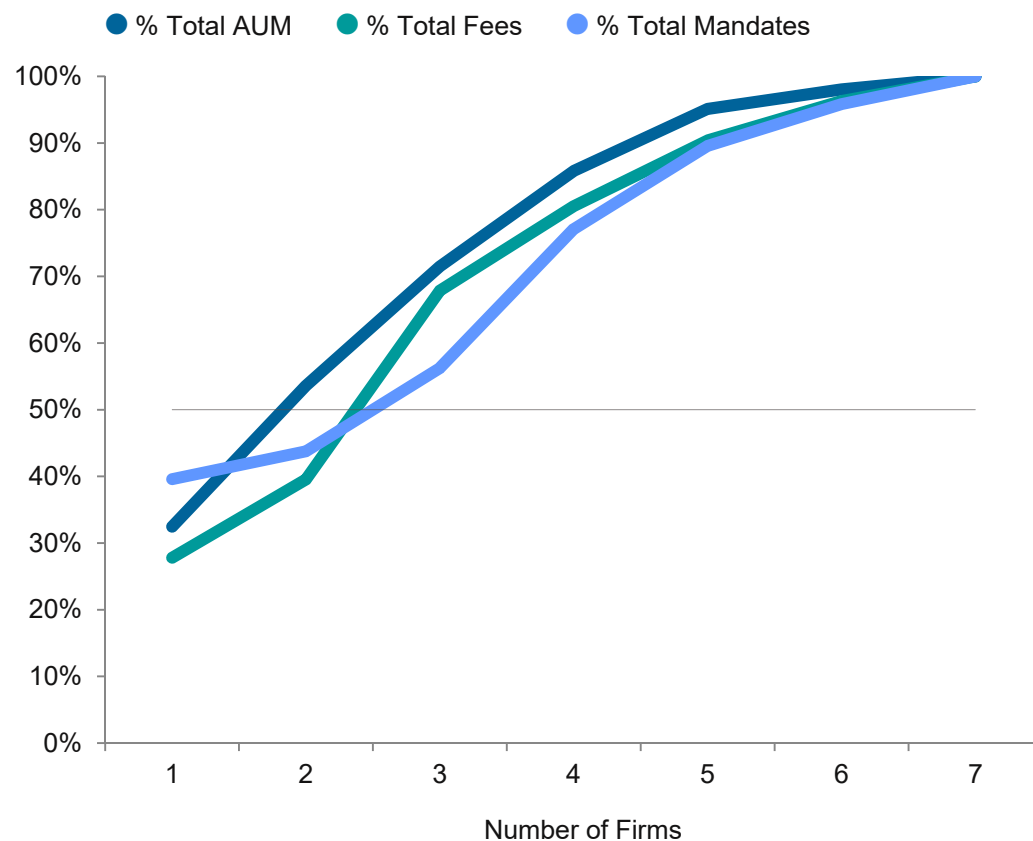
Concentration Analysis: Passive U.S. Core Fixed Income

\$35.8 billion in assets and **\$6.6** million in fees

49 mandates with **7** different firms

- ▶ 50% of assets managed by 2 firms (29%)
- ▶ 50% of fees made by 3 firms (43%)
- ▶ 50% of mandates run by 3 firms (43%)

Concentration by Firm



For a full explanation of the analysis on this page please refer to pages 8.

Appendix

2021 Published Fees for Additional Asset Classes

	Large Cap Core						Large Cap Growth						Large Cap Value					
	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm
10th Percentile	75	70	65	60	59	55	75	75	70	67	65	56	80	75	66	61	59	54
25th Percentile	65	60	58	53	51	46	70	65	61	57	55	52	70	65	60	55	53	48
Median	55	54	50	46	44	41	65	60	57	53	51	46	60	60	55	50	49	44
75th Percentile	45	42	42	40	40	35	55	55	53	50	48	43	53	50	47	44	43	38
90th Percentile	35	35	35	33	33	31	50	50	48	45	43	36	45	44	40	36	34	29
Average	55	54	50	46	44	41	65	60	57	53	51	46	60	60	55	50	49	44
	Mid Cap Core						Mid Cap Growth						Mid Cap Value					
	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm
10th Percentile	92	87	82	77	74	71	93	83	81	76	76	71	85	85	80	74	72	68
25th Percentile	85	85	77	70	70	66	80	80	75	73	71	66	80	80	75	71	69	65
Median	70	70	66	65	63	58	75	75	70	67	65	61	75	75	70	65	65	60
75th Percentile	60	60	58	55	54	51	70	70	65	63	61	56	70	65	60	56	55	50
90th Percentile	50	41	38	37	37	33	55	55	50	46	46	44	60	56	52	49	46	42
Average	70	70	66	65	63	58	75	75	70	67	65	61	75	75	70	65	65	60
	Small Cap Core						Small Cap Growth						Small Cap Value					
	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm
10th Percentile	100	100	92	90	89	88	100	100	100	100	100	100	100	100	100	100	100	100
25th Percentile	90	90	85	82	80	77	100	100	95	93	93	84	100	100	93	89	87	82
Median	85	85	80	77	75	70	90	90	85	82	80	75	90	90	85	82	80	75
75th Percentile	75	75	70	68	67	62	85	85	80	77	75	69	80	80	78	75	73	67
90th Percentile	60	60	60	58	57	51	80	79	75	72	70	65	75	75	70	68	67	61
Average	85	85	80	77	75	70	90	90	85	82	80	75	90	90	85	82	80	75

2021 Published Fees for Additional Asset Classes (continued)

	Unconstrained						Extended Maturity						Government/Credit					
	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm
10th Percentile	85	85	85	85	85	85	35	35	30	30	30	28	43	41	37	34	32	28
25th Percentile	55	55	55	55	55	53	30	30	30	30	29	26	35	35	31	30	29	24
Median	45	45	45	45	45	40	30	30	30	28	28	24	30	30	28	26	25	21
75th Percentile	38	38	38	38	38	34	26	26	26	25	25	23	25	25	25	25	23	20
90th Percentile	35	35	34	32	31	29	25	25	23	22	22	21	24	24	23	22	22	18
Average	45	45	45	45	45	40	30	30	30	28	28	24	30	30	28	26	25	21

	Intermediate Fixed Income						TIPS						Short Fixed Income					
	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm
10th Percentile	36	35	33	32	30	28	105	105	105	105	105	105	25	25	25	25	25	24
25th Percentile	35	30	30	29	28	24	57	57	57	57	57	57	25	25	25	23	22	20
Median	30	29	28	25	24	21	20	20	20	20	20	20	22	22	20	20	20	17
75th Percentile	25	25	23	22	21	19	10	10	10	10	10	10	19	19	18	18	17	15
90th Percentile	25	22	20	19	18	16	6	6	6	6	6	5	15	15	15	14	14	12
Average	30	29	28	25	24	21	20	20	20	20	20	20	22	22	20	20	20	17

	Municipal Bond						Active Cash						Global ex-U.S. Fixed Income					
	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm
10th Percentile	48	41	40	40	40	40	22	20	20	20	20	20	50	50	50	49	49	46
25th Percentile	40	35	33	31	30	30	20	20	20	18	17	15	46	46	46	45	43	39
Median	30	30	28	26	25	23	15	15	15	15	15	14	43	43	43	39	37	34
75th Percentile	25	25	25	25	24	20	13	13	13	13	13	11	35	35	35	35	34	32
90th Percentile	23	22	21	20	20	18	10	10	10	10	10	10	32	32	32	30	30	27
Average	30	30	28	26	25	23	15	15	15	15	15	14	43	43	43	39	37	34

2021 Published Fees for Additional Asset Classes (continued)

	Global ex-U.S. Developed Core Equity						Global ex-U.S. Developed Growth Equity						Global ex-U.S. Developed Value Equity					
	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm
10th Percentile	83	83	80	75	74	68	90	85	83	81	78	70	97	96	84	82	82	81
25th Percentile	75	75	75	72	70	64	80	78	75	71	69	61	75	75	73	70	69	65
Median	73	70	68	63	61	54	75	74	66	63	60	54	70	70	70	66	65	58
75th Percentile	60	60	60	55	53	49	60	60	56	55	54	49	64	64	62	58	56	50
90th Percentile	53	53	52	49	48	41	51	51	51	50	49	46	45	45	45	43	43	37
Average	73	70	68	63	61	54	75	74	66	63	60	54	70	70	70	66	65	58

	Global Developed Core Equity						Global Developed Growth Equity						Global Developed Value Equity					
	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm	\$10mm	\$25mm	\$50mm	\$75mm	\$100mm	\$200mm
10th Percentile	87	82	81	80	79	75	103	91	86	83	81	77	113	113	100	96	94	91
25th Percentile	75	75	75	71	70	65	80	80	75	75	74	68	75	75	75	74	74	69
Median	65	65	64	60	60	55	75	75	70	67	65	61	73	73	70	65	63	57
75th Percentile	50	49	47	45	45	42	65	65	63	60	58	51	68	66	63	58	57	49
90th Percentile	25	25	25	25	25	25	49	49	49	49	49	47	65	64	60	55	53	43
Average	65	65	64	60	60	55	75	75	70	67	65	61	73	73	70	65	63	57

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