
Morningstar's Active/Passive Barometer

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Executive Summary

The Morningstar Active/Passive Barometer is a semiannual report that measures the performance of active funds against passive peers in their respective Morningstar Categories. The U.S. Active/Passive Barometer spans nearly 4,000 unique funds that accounted for approximately \$18.7 trillion in assets, or about 67% of the U.S. fund market, as of the end of 2021.

The Active/Passive Barometer measures active managers' success in several unique ways:

- ▶ It evaluates active funds against a composite of passive funds. In this way, the "benchmark" reflects the actual, net-of-fees performance of investable passive funds.
- ▶ It considers how the average dollar invested in active funds has fared versus the average dollar invested in passive funds.
- ▶ It examines trends in active-fund success by fee level.
- ▶ It shows the distribution of surviving active funds' excess returns versus their average passive peer to help investors understand not just the odds of picking a successful manager but also the prospective payout or penalty.

The Active/Passive Barometer is a useful measuring stick that helps investors calibrate the odds of succeeding with active funds in different categories.

Key Takeaways

- ▶ Active funds' success rate slipped in 2021. Last year, 45% of the active funds across the 20 Morningstar Categories included in our analysis both survived and outperformed their average passive peer. This marks a slight decline versus calendar 2020, when 49% of active funds lived and beat their typical indexed peer.
- ▶ U.S. stock-pickers' one-year success rate was 41% in 2021, roughly flat versus 2020. But within the nine categories that comprise the U.S. equity Morningstar Style Box, there was a noticeable shift. Success rates increased across all three blend categories, while they declined in five of the six value and growth categories. This was partly driven by the fact that value stocks kept pace with their growth counterparts in 2021 after getting trounced by them in 2020.
- ▶ A smaller segment of active foreign stock funds succeeded in 2021 relative to 2020. Active managers' success rate declined in four of the six categories we examined, and the combined one-year success rate among this group was 37%.
- ▶ Most active fixed-income funds succeeded in 2021 by virtue of losing relatively less than their average passive peer. The success rate for active managers across the three fixed-income categories in our analysis increased to 70% last year from 43% in 2020. The fact that most active funds took less interest-rate risk than their typical passive peer was to their benefit as interest rates rose.
- ▶ Active funds' short-term success rates are noisy. Their volatility can be influenced by countless factors. Over longer time horizons, there is less noise and the signal regarding active funds' odds of succeeding is clearer. In this installment of our semiannual report, we have introduced charts that plot rolling success rates for active funds in each category, which better depict this phenomenon.
- ▶ In general, actively managed funds have failed to survive and beat their average passive peer, especially over longer time horizons; only 26% of all active funds topped the average of their passive rivals over the 10-year period ended December 2021; long-term success rates were generally higher among foreign-stock, real estate, and bond funds and lowest among U.S. large-cap funds.
- ▶ The distribution of 10-year excess returns for surviving active funds versus the average of their passive peers varies widely across categories. In the case of U.S. large-cap funds, it skews negative, indicating that the likelihood and performance penalty for picking an underperforming manager tends to be greater than the probability and reward for finding a winner. The inverse tends to be true of the fixed-income and foreign-stock categories we examined, where excess returns among surviving active managers skewed positive over the past decade.
- ▶ Over the past 10 years, the average dollar invested in active funds outperformed the average active fund in 17 of the 20 categories examined; this implies that investors have favored cheaper, higher-quality funds (see Exhibit 4).
- ▶ The cheapest funds succeeded about twice as often as the priciest ones (a 35% success rate versus a 18% success rate) over the 10-year period ended Dec. 31, 2021. This not only reflects cost advantages but also differences in survival, as 68% of the cheapest funds survived, whereas 54% of the most expensive did so.

Exhibit 1 Active Funds' Success Rate by Category (%)

Category	1-Year	3-Year	5-Year	10-Year	15-Year	20-Year	10-Year (Lowest Cost) *	10-Year (Highest Cost)
U.S. Large Blend	41.4	33.5	20.6	9.5	9.4	9.3	19.2	1.3
U.S. Large Value	34.1	37.0	21.9	14.8	12.8	13.4	27.1	9.8
U.S. Large Growth	31.9	31.5	31.8	8.2	6.2	5.5	18.0	3.4
U.S. Mid Blend	66.7	30.0	18.8	16.9	7.7	6.6	29.2	4.0
U.S. Mid Value	28.8	53.2	37.1	10.7	25.6	—	9.1	28.6
U.S. Mid Growth	46.0	52.2	56.1	37.9	22.3	—	41.5	32.6
U.S. Small Blend	58.6	39.1	23.2	17.2	12.3	19.8	31.4	13.9
U.S. Small Value	37.1	41.4	36.2	20.2	26.9	17.9	20.0	5.0
U.S. Small Growth	47.4	65.8	55.1	44.0	27.9	12.9	48.8	48.8
Foreign Large Blend	43.7	51.4	38.5	31.6	29.1	23.2	48.6	18.4
Foreign Large Value	33.7	54.7	35.6	29.8	11.4	—	28.6	14.3
Foreign Small-Mid Blend	48.1	48.5	31.3	31.8	—	—	75.0	40.0
World Large-Blend	38.9	26.5	18.9	16.7	—	—	22.2	10.0
Diversified Emerging Markets	30.1	61.3	47.4	54.4	40.7	—	69.0	53.3
Europe Stock	53.3	73.7	50.0	42.9	37.9	21.8	80.0	16.7
U.S. Real Estate	82.5	83.6	64.2	48.5	27.0	41.1	50.0	30.8
Global Real Estate	83.3	72.2	62.9	50.0	—	—	33.3	50.0
Intermediate Core Bond	69.2	47.0	43.2	37.8	17.0	8.8	54.8	20.6
Corporate Bond	64.2	47.5	26.0	28.9	—	—	33.3	25.0
High-Yield Bond	72.0	56.1	44.7	55.3	—	—	76.9	36.7

Source: Morningstar. Data and calculations as of Dec. 31, 2021. *Green/red shading indicates that active funds in this fee quintile had above/below-average success rates.

Exhibit 2 Year-Over-Year Change in Active Funds' One-Year Success Rate by Category (%)

	2021	2020	Year-Over-Year Change
U.S. Large Blend	41.4	34.1	7.4
U.S. Large Value	34.1	47.8	-13.7
U.S. Large Growth	31.9	42.3	-10.4
U.S. Mid Blend	66.7	25.2	41.4
U.S. Mid Value	28.8	78.9	-50.1
U.S. Mid Growth	46.0	38.1	7.9
U.S. Small Blend	58.6	37.5	21.1
U.S. Small Value	37.1	46.1	-9.0
U.S. Small Growth	47.4	71.9	-24.5
Foreign Large Blend	43.7	59.7	-16.0
Foreign Large Value	33.7	76.4	-42.7
Foreign Small-Mid Blend	48.1	46.9	1.3
World Large-Blend	38.9	25.8	13.1
Diversified Emerging Markets	30.1	70.1	-40.0
Europe Stock	53.3	76.5	-23.1
U.S. Real Estate	82.5	74.2	8.3
Global Real Estate	83.3	71.7	11.6
Intermediate Core Bond	69.2	52.8	16.3
Corporate Bond	64.2	64.3	-0.1
High-Yield Bond	72.0	60.4	11.6

Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 3 Trends in Active Funds' One-Year Success Rates by Category (%)

	2015		2016		2017		2018		2019		2020		2021		Trend
	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	
U.S. Large Blend	40.1	28.3	18.4	23.7	43.3	34.0	33.6	25.8	30.5	38.0	39.2	34.1	44.0	41.4	
U.S. Large Value	44.5	28.2	13.3	20.6	58.8	33.3	32.5	28.0	31.4	37.0	41.2	47.8	45.2	34.1	
U.S. Large Growth	40.5	45.7	17.5	28.2	37.5	45.7	44.3	46.6	50.4	39.8	46.6	42.3	36.6	31.9	
U.S. Mid-Blend	38.2	40.0	22.2	20.2	37.7	29.9	25.2	32.8	46.3	58.3	33.9	25.2	42.0	66.7	
U.S. Mid-Value	64.8	51.3	8.3	20.2	52.6	44.8	32.4	22.7	30.0	63.3	71.6	78.9	37.4	28.8	
U.S. Mid-Growth	50.7	41.5	33.8	29.1	46.5	54.0	40.0	75.3	79.2	74.7	59.6	38.1	19.5	46.0	
U.S. Small Blend	34.9	47.8	45.5	34.4	27.8	43.2	18.6	20.2	41.6	47.9	29.2	37.5	39.2	58.6	
U.S. Small Value	45.3	65.8	23.0	13.7	62.9	56.0	27.0	17.7	40.7	46.6	41.6	46.1	25.6	37.1	
U.S. Small Growth	54.2	23.5	29.4	28.8	56.8	59.5	42.8	50.5	75.0	75.7	69.4	71.9	41.6	47.4	
Foreign Large Blend	57.2	61.9	45.7	28.4	44.6	52.0	28.4	19.9	29.4	58.2	55.5	59.7	58.5	43.7	
Foreign Large Value	84.4	88.4	32.3	22.0	50.0	68.3	39.1	14.6	10.6	34.9	64.8	76.4	53.5	33.7	
Foreign Small-Mid Blend	40.0	34.6	18.5	34.6	53.6	62.5	25.8	20.6	35.5	51.5	33.3	46.9	53.6	48.1	
World Large-Blend	29.2	56.1	26.9	25.0	50.0	45.9	39.2	31.3	39.0	56.6	26.2	25.8	55.3	38.9	
Diversified Emg Mrkts	50.3	67.9	69.5	27.8	56.5	63.4	48.0	19.7	32.5	67.2	63.1	70.1	66.2	30.1	
Europe Stock	65.0	75.0	36.8	19.0	23.8	54.5	21.7	25.0	20.8	52.6	72.2	76.5	73.3	53.3	
U.S. Real Estate	81.8	83.6	55.2	4.4	13.2	31.3	36.9	20.9	63.1	80.3	84.1	74.2	11.9	82.5	
Global Real Estate	70.4	41.1	73.7	53.2	17.7	12.9	27.1	67.2	76.4	68.5	74.1	71.7	70.0	83.3	
Intermediate Core Bond	18.1	27.3	19.3	55.0	75.0	48.1	57.6	45.5	17.5	35.7	30.9	52.8	84.7	69.2	
Corporate Bond	29.8	26.7	58.3	65.3	60.0	66.0	23.5	64.3	28.6	37.3	56.1	64.3	67.3	64.2	
High-Yield Bond	47.2	45.4	24.1	44.8	67.7	70.7	35.6	23.6	41.4	59.3	52.9	60.4	69.3	72.0	

Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 4 Comparison of Asset- and Equal-Weighted 10-Year Returns %

Category	Active Funds			Passive Funds			Difference Between Passive and Active Returns	
	Asset- Weighted	Equal- Weighted	Difference	Asset- Weighted	Equal- Weighted	Difference	Asset- Weighted	Equal- Weighted
U.S. Large Blend	14.7	14.2	0.5	16.3	16.0	0.3	1.6	1.8
U.S. Large Value	13.1	12.2	0.9	13.1	13.0	0.1	0.0	0.8
U.S. Large Growth	18.1	17.0	1.1	20.3	19.1	1.2	2.2	2.1
U.S. Mid Blend	13.8	13.0	0.8	14.6	13.9	0.7	0.8	0.9
U.S. Mid Value	12.3	12.4	-0.1	12.8	13.4	-0.6	0.5	1.0
U.S. Mid Growth	15.6	15.6	0.0	15.7	14.9	0.8	0.1	-0.7
U.S. Small Blend	12.5	12.5	0.0	13.8	13.4	0.4	1.3	0.9
U.S. Small Value	11.6	11.3	0.3	12.7	12.1	0.6	1.1	0.8
U.S. Small Growth	15.6	15.4	0.2	14.6	13.9	0.7	-1.0	-1.5
Foreign Large Blend	9.3	8.1	1.2	7.9	7.9	0.0	-1.4	-0.2
Foreign Large Value	7.7	6.9	0.8	6.1	6.5	-0.4	-1.6	-0.4
Foreign Small-Mid Blend	8.0	9.5	-1.5	9.5	9.3	0.2	1.5	-0.2
World Large-Blend	11.1	10.8	0.3	12.1	12.5	-0.4	1.0	1.7
Diversified Emerging Markets	6.1	6.0	0.1	5.0	4.3	0.7	-1.1	-1.7
Europe Stock	8.5	9.6	-1.1	7.9	7.9	0.0	-0.6	-1.7
U.S. Real Estate	11.3	11.1	0.2	11.2	10.6	0.6	-0.1	-0.5
Global Real Estate	9.1	9.1	0.0	7.4	7.8	-0.4	-1.7	-1.3
Intermediate Core Bond	3.2	2.9	0.3	2.8	2.5	0.3	-0.4	-0.4
Corporate Bond	5.2	4.6	0.6	4.7	4.9	-0.2	-0.5	0.3
High-Yield Bond	6.2	5.7	0.5	5.4	5.3	0.1	-0.8	-0.4

Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Results by Category

U.S. Large-Cap Funds

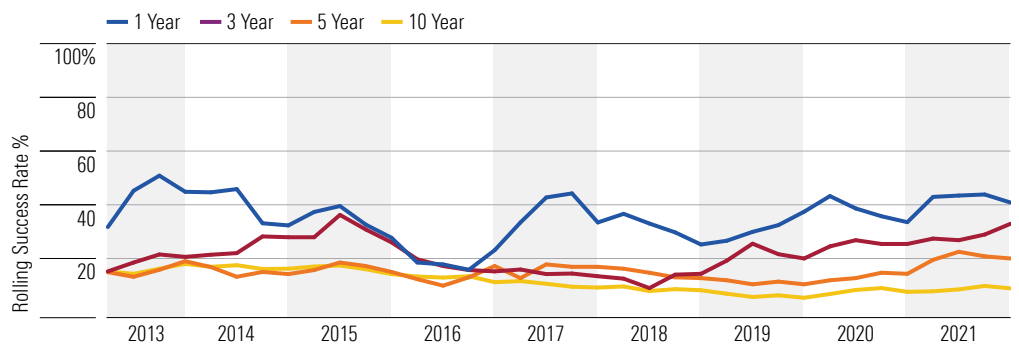
- ▶ Over the long haul, actively managed U.S. large-cap equity funds have generally succeeded less often than active U.S. mid- and small-cap funds. Over the decade through Dec. 31, 2021, 10.4% of active large-cap funds lived and outperformed their average passive peer. This compares with success rates of 25.3% and 29.4% among actively managed mid- and small-cap funds, respectively.
- ▶ Active managers in the large-growth category have had a particularly difficult time delivering value for investors. Nearly 70% of the active funds that existed in this category 20 years ago have died, and just 5.5% managed to both survive and outperform their average passive peer.
- ▶ The spread between growth and value stocks' performance narrowed dramatically in 2021. In 2020, the Morningstar U.S. Growth Index outperformed the Morningstar U.S. Value Index by nearly 46 percentage points. In 2021, the growth index outperformed its value counterpart by less than 1 percentage point. This partly explains the recent volatility we have seen in active value and growth funds' short-term success rates.
- ▶ Attrition rates are high among large-cap funds. Overall, just 34% of large-cap funds survived the 20-year period ended Dec. 31, 2021. The odds of survival improved to about 60% for the lowest-cost funds but sagged to 52% for the highest-cost funds during that same time frame.
- ▶ Pricey active large-cap funds are doomed to failure: Just 4% of these funds beat their passive composite over the decade ended Dec. 31, 2021.
- ▶ At 45.6%, passively managed large-blend funds had the lowest 20-year survivorship rate of any U.S. equity category for which we have 20 years of data. This was driven largely by attrition among the most expensive passive options in this category.
- ▶ Investors tend to favor cheaper, more successful active large-cap funds, as evidenced by the fact that the average asset-weighted active return surpassed the average equal-weighted active return across all large-cap categories and time horizons we examined.
- ▶ The median 10-year excess return for surviving active funds across all three U.S. large-cap categories was negative, and the distributions of excess returns had a negative skew. This indicates that the penalty for poor manager selection tended to be greater than the reward for choosing a winner.

Exhibit 5 U.S. Large Blend

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	379	95.0	208	98.1	26.2	27.3	25.1	26.5	41.4
3-Year	355	87.0	190	91.1	22.9	25.6	22.8	24.2	33.5
5-Year	360	78.6	146	85.6	16.1	18.1	15.6	17.5	20.6
10-Year	400	62.0	115	73.0	14.7	16.3	14.2	16.0	9.5
15-Year	498	43.8	109	58.7	9.3	10.6	9.2	10.3	9.4
20-Year	409	32.8	103	45.6	9.2	9.5	8.8	9.3	9.3
Performance by Fee Quintile (Trailing 10 Years)									
20th Percentile	78	60.3	21	76.2	15.3	16.4	14.9	16.4	19.2
40th Percentile	81	67.9	23	87.0	14.7	15.9	14.9	16.2	13.6
60th Percentile	80	72.5	23	69.6	14.4	15.9	14.0	15.9	2.5
80th Percentile	79	59.5	25	64.0	14.4	15.9	13.8	15.6	10.1
100th Percentile	80	48.8	21	66.7	12.8	15.4	13.0	15.5	1.3

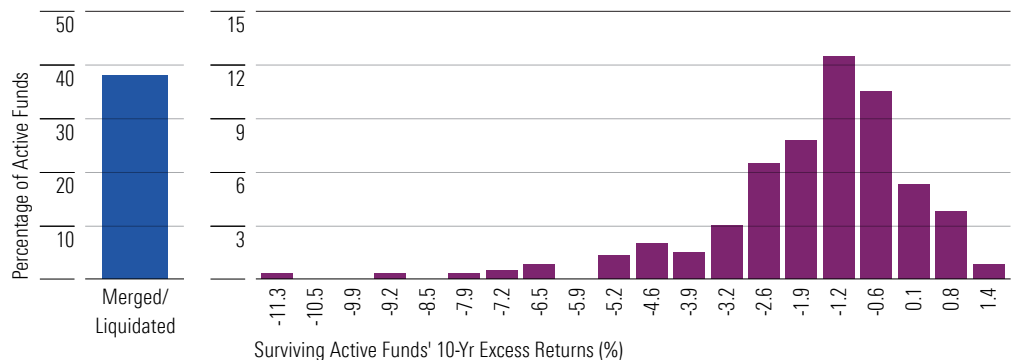
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 6 Rolling Success Rates for Surviving Active U.S. Large-Blend Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 7 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Large-Blend Funds



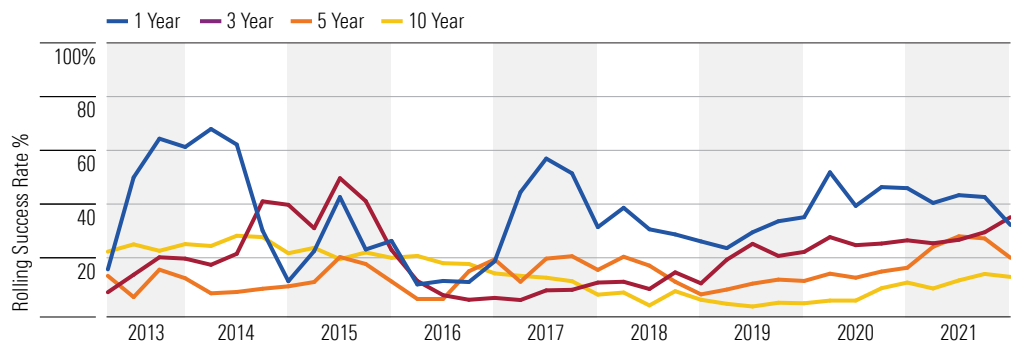
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 8 U.S. Large Value

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	311	94.9	100	99.0	26.4	26.1	25.7	27.0	34.1
3-Year	316	84.2	99	89.9	18.3	17.7	17.6	17.9	37.0
5-Year	324	75.9	68	95.6	12.5	12.2	11.5	12.1	21.9
10-Year	305	62.6	37	97.3	13.1	13.1	12.2	13.0	14.8
15-Year	366	47.8	25	88.0	8.0	8.1	7.5	8.1	12.8
20-Year	313	37.7	11	54.5	8.2	8.1	8.0	8.3	13.4
Performance by Fee Quintile (Trailing 10 Years)									
20th Percentile	59	61.0	7	100.0	13.8	13.4	12.9	13.3	27.1
40th Percentile	62	71.0	8	87.5	13.3	12.8	12.5	12.8	17.7
60th Percentile	66	65.2	6	100.0	12.4	13.5	11.7	13.3	7.6
80th Percentile	56	67.9	8	100.0	12.1	11.9	12.2	12.9	12.5
100th Percentile	61	49.2	7	100.0	11.5	12.5	11.8	12.5	9.8

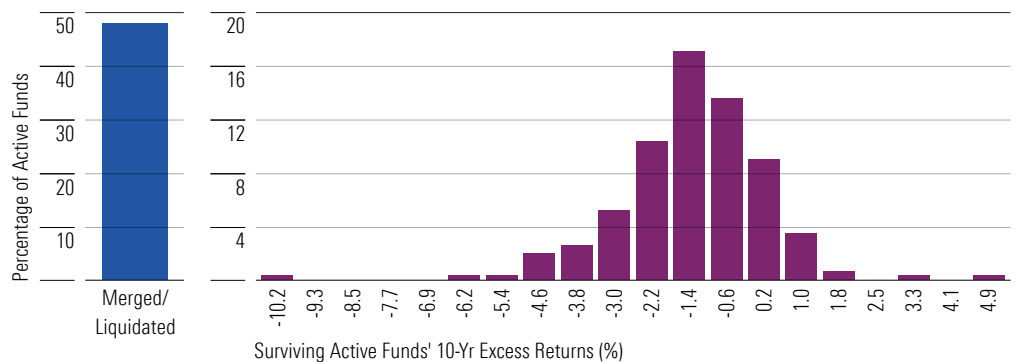
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 9 Rolling Success Rates for Surviving Active U.S. Large-Value Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 10 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Large-Value Funds



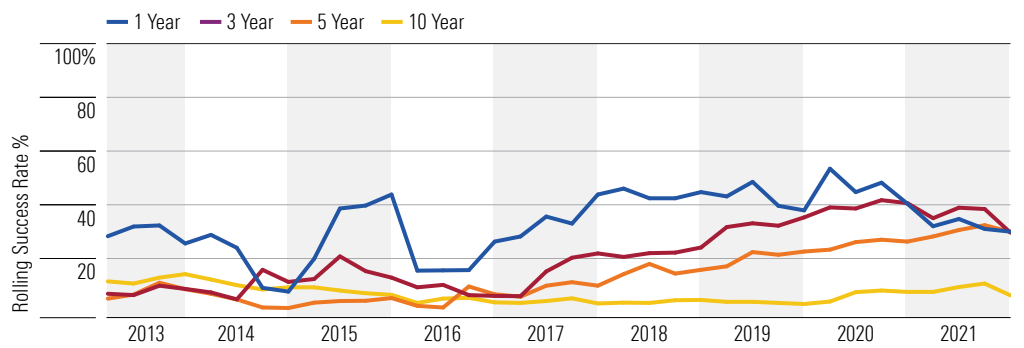
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 11 U.S. Large Growth

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	354	96.6	67	98.5	20.5	27.1	20.0	24.2	31.9
3-Year	375	88.8	65	90.8	29.5	34.3	29.1	30.4	31.5
5-Year	393	79.9	50	96.0	22.5	25.0	21.6	22.6	31.8
10-Year	441	61.0	40	87.5	18.1	20.3	17.0	19.1	8.2
15-Year	468	40.2	29	86.2	12.0	14.1	11.9	13.3	6.2
20-Year	385	31.4	16	75.0	10.0	11.4	9.7	10.7	5.5
Performance by Fee Quintile (Trailing 10 Years)									
20th Percentile	89	58.4	8	100.0	18.8	20.4	18.4	20.0	18.0
40th Percentile	87	71.3	8	100.0	17.7	19.3	16.8	19.3	4.6
60th Percentile	88	61.4	7	85.7	18.2	20.0	17.4	19.8	11.4
80th Percentile	88	55.7	8	75.0	16.5	19.6	16.5	19.3	3.4
100th Percentile	88	58.0	8	75.0	17.1	20.3	16.1	16.8	3.4

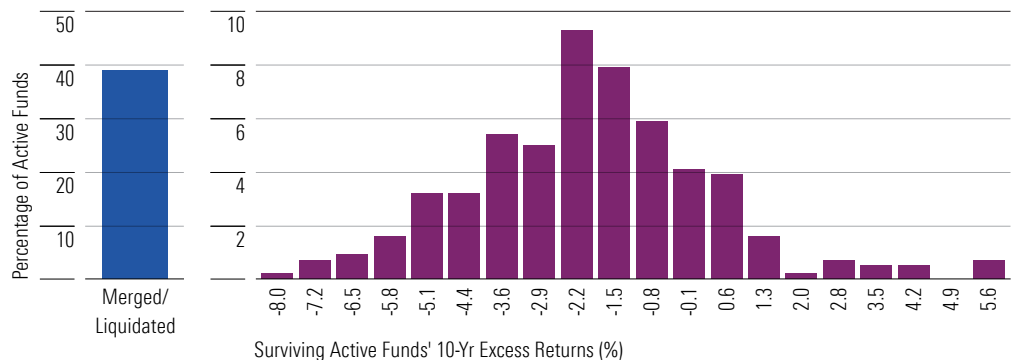
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 12 Rolling Success Rates for Surviving Active U.S. Large-Growth Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 13 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Large-Growth Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

U.S. Mid-Cap Funds

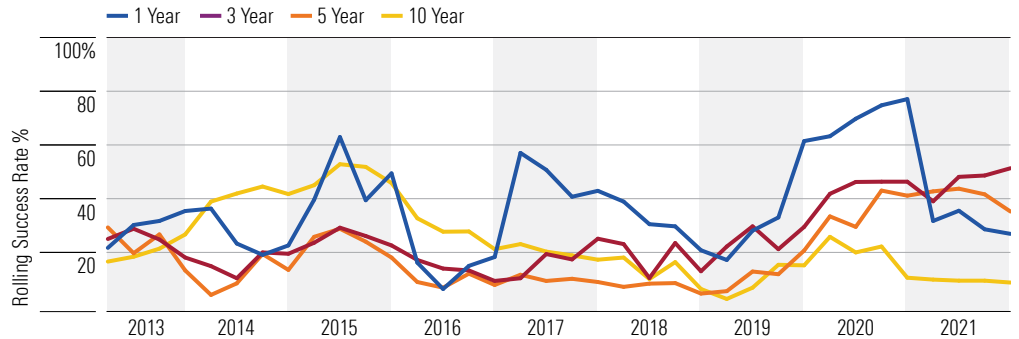
- ▶ Nearly 47% of active mid-cap funds beat their average passive counterpart in 2021.
- ▶ Active mid-cap value funds' success rate declined significantly versus 2020, while mid-cap blend funds' success rate spiked higher. Success rates in these categories have been whipsawed by divergent performance trends between value and growth stocks and large caps versus small caps. This is nothing new; success rates for actively managed U.S. mid-cap funds have tended to be more widely dispersed and variable than those for U.S. large- or small-cap funds.
- ▶ These extremes are partly evidence of the "crossroads" status of the mid-cap category, which is populated with many funds that may have relatively messy portfolios (those that bleed into other market-cap segments and styles) or could otherwise be passersby as they migrate "south" from large-cap territory or "north" from the small-cap space, for example.

Exhibit 14 U.S. Mid-Blend

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	102	99.0	63	100.0	22.4	20.4	23.8	22.5	66.7
3-Year	120	85.8	63	85.7	21.4	23.0	20.3	21.0	30.0
5-Year	117	73.5	56	85.7	12.6	14.6	12.1	13.4	18.8
10-Year	124	65.3	44	79.5	13.8	14.6	13.0	13.9	16.9
15-Year	143	58.7	30	70.0	8.6	10.3	8.7	9.9	7.7
20-Year	106	41.5	22	50.0	9.5	10.5	9.5	10.3	6.6
Performance by Fee Quintile									
(Trailing 10 Years)									
20th Percentile	24	75.0	9	66.7	13.9	14.8	13.6	14.6	29.2
40th Percentile	25	80.0	8	87.5	15.0	14.0	13.8	14.2	32.0
60th Percentile	24	54.2	10	80.0	12.7	13.8	13.4	14.0	12.5
80th Percentile	25	64.0	8	75.0	13.1	13.2	12.5	13.4	8.0
100th Percentile	25	52.0	8	87.5	10.8	13.8	10.9	12.9	4.0

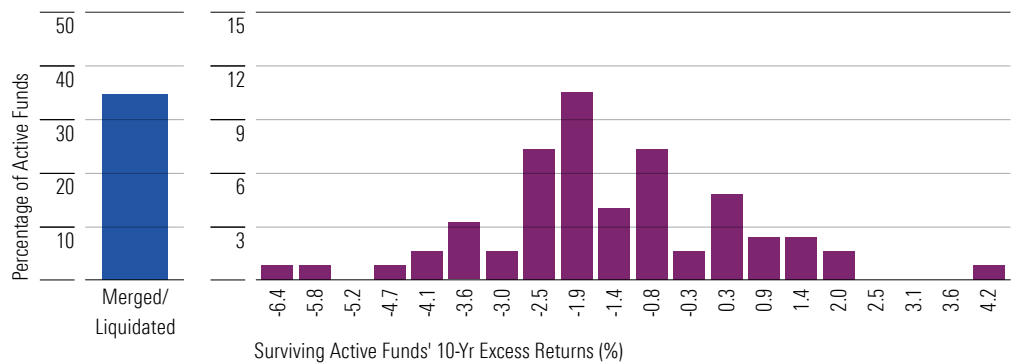
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 15 Rolling Success Rates for Surviving Active U.S. Mid-Blend Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 16 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Mid-Blend Funds



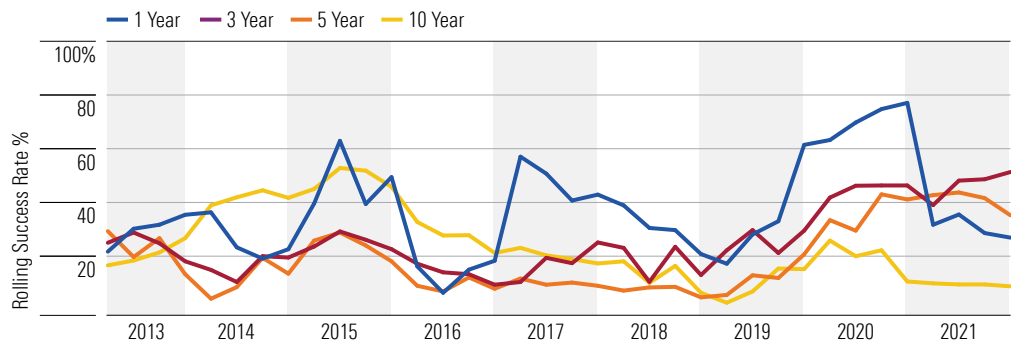
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 17 U.S. Mid-Value

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	104	97.1	30	96.7	27.9	28.9	29.3	31.5	28.8
3-Year	109	82.6	29	86.2	19.4	18.1	19.5	18.1	53.2
5-Year	105	80.0	24	95.8	11.5	10.8	11.0	10.8	37.1
10-Year	112	60.7	19	94.7	12.3	12.8	12.4	13.4	10.7
15-Year	117	53.8	11	90.9	8.0	8.7	8.4	8.2	25.6
Performance by Fee Quintile (Trailing 10 Years)									
20th Percentile	22	54.5	4	100.0	12.7	13.4	13.0	14.4	9.1
40th Percentile	22	59.1	3	100.0	12.6	13.6	11.8	13.5	9.1
60th Percentile	22	72.7	3	100.0	11.9	12.3	11.9	13.2	4.5
80th Percentile	24	62.5	4	75.0	12.1	13.2	12.2	13.8	4.2
100th Percentile	21	57.1	4	100.0	13.0	12.0	13.6	12.0	28.6

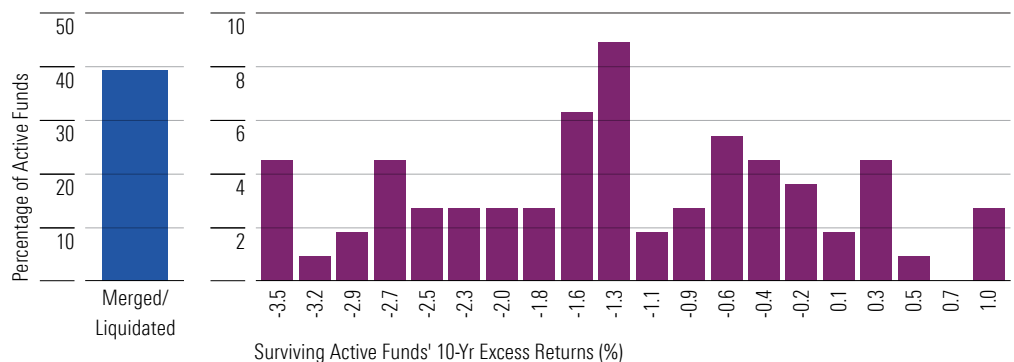
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 18 Rolling Success Rates for Surviving Active U.S. Mid-Value Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 19 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Mid-Value Funds



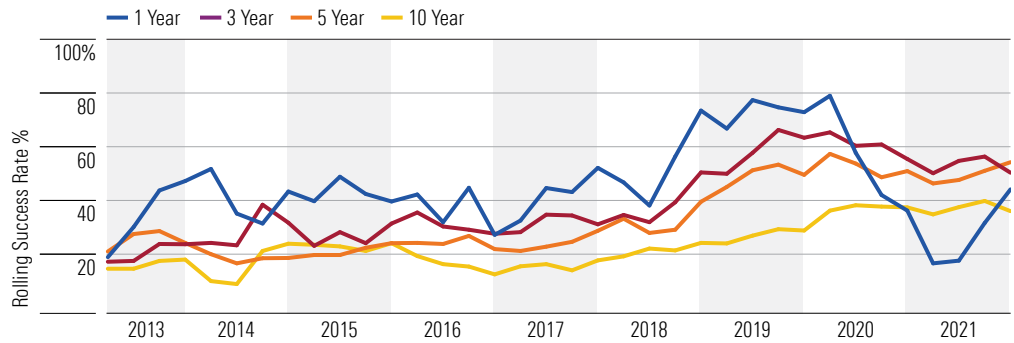
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 20 U.S. Mid-Growth

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	174	95.4	30	100.0	11.4	16.0	14.2	14.9	46.0
3-Year	178	90.4	32	84.4	26.9	26.3	28.0	25.7	52.2
5-Year	187	78.1	28	78.6	19.3	17.9	19.7	17.2	56.1
10-Year	214	63.1	20	75.0	15.6	15.7	15.6	14.9	37.9
15-Year	292	44.5	11	81.8	10.8	11.2	11.1	10.9	22.3
Performance by Fee Quintile (Trailing 10 Years)									
20th Percentile	41	70.7	3	100.0	15.4	15.9	15.7	15.7	41.5
40th Percentile	43	65.1	4	100.0	15.5	14.5	15.4	15.0	41.9
60th Percentile	42	64.3	4	—	15.7	11.5	16.5	—	42.9
80th Percentile	43	60.5	5	80.0	15.4	15.2	14.8	15.8	32.6
100th Percentile	43	58.1	3	100.0	16.5	14.6	15.3	12.8	32.6

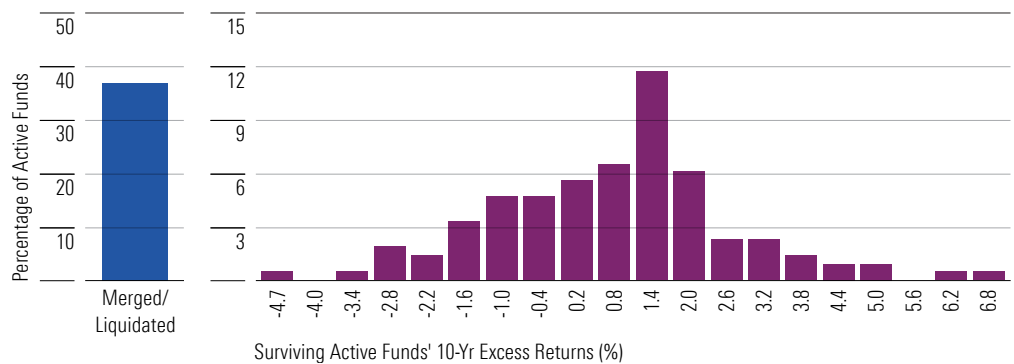
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 21 Rolling Success Rates for Surviving Active U.S. Mid-Growth Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 22 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Mid-Growth Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

U.S. Small-Cap Funds

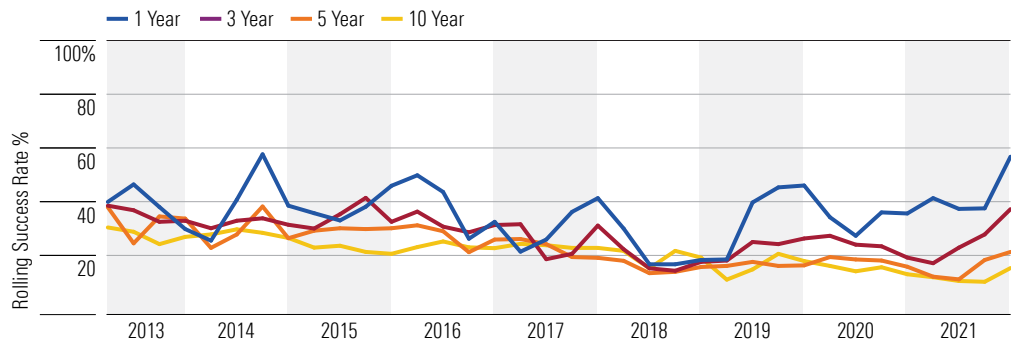
- ▶ Nearly half (49%) of all active small-cap funds outperformed their average passive peer in 2021.
- ▶ Long-run success rates among actively managed U.S. small-cap funds have generally been higher than those seen among large-cap funds, though not materially so.

Exhibit 23 U.S. Small Blend

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	181	95.6	70	100.0	25.3	19.3	24.6	22.7	58.6
3-Year	215	78.1	65	93.8	20.3	20.4	20.0	19.8	39.1
5-Year	220	73.2	48	87.5	11.3	12.6	11.2	12.0	23.2
10-Year	180	67.2	40	80.0	12.5	13.8	12.5	13.4	17.2
15-Year	195	48.2	32	62.5	8.5	9.4	8.4	8.9	12.3
20-Year	111	51.4	19	57.9	9.2	9.9	9.7	9.8	19.8
Performance by Fee Quintile									
(Trailing 10 Years)									
20th Percentile	35	71.4	7	85.7	13.7	13.7	13.5	13.7	31.4
40th Percentile	36	72.2	8	75.0	11.9	13.6	12.4	13.4	11.1
60th Percentile	36	66.7	9	77.8	11.0	13.4	12.1	13.4	13.9
80th Percentile	36	63.9	7	85.7	11.4	13.8	12.5	14.1	13.9
100th Percentile	36	61.1	8	75.0	11.5	13.0	11.8	12.4	13.9

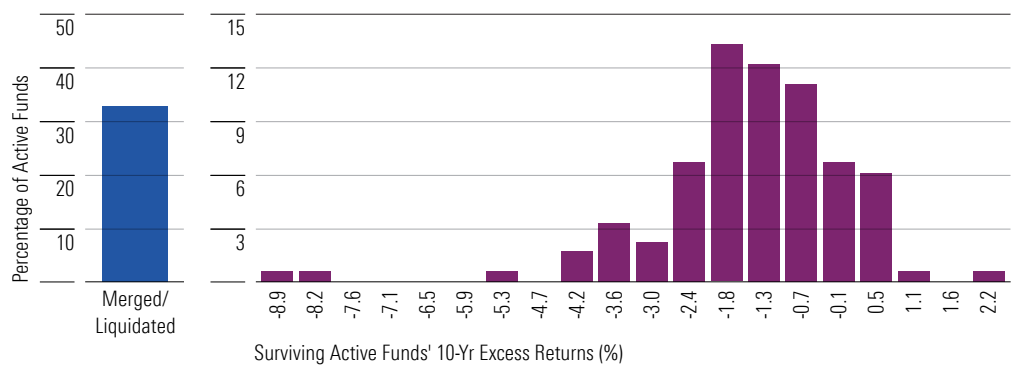
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 24 Rolling Success Rates for Surviving Active U.S. Small-Blend Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 25 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Small-Blend Funds



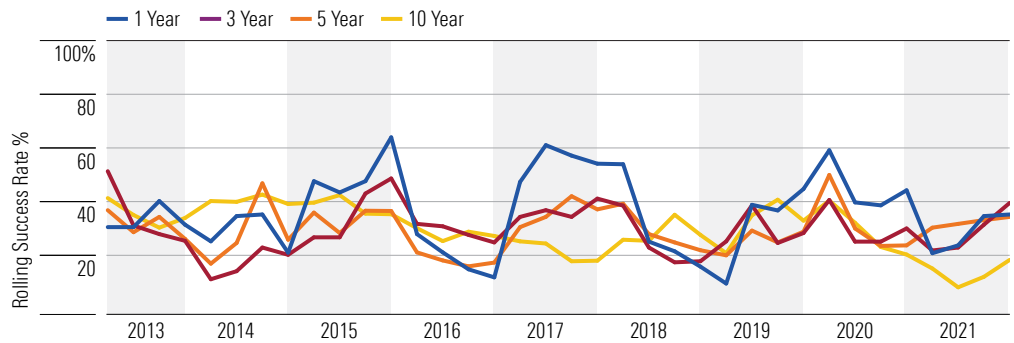
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 26 U.S. Small Value

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	116	94.0	23	100.0	33.0	28.6	31.1	33.4	37.1
3-Year	116	80.2	27	92.6	18.9	17.8	18.6	18.1	41.4
5-Year	116	78.4	22	95.5	9.3	9.5	9.0	8.9	36.2
10-Year	104	72.1	18	94.4	11.6	12.7	11.3	12.1	20.2
15-Year	134	55.2	10	90.0	7.7	8.0	8.1	7.7	26.9
20-Year	112	54.5	5	80.0	9.6	9.3	9.6	9.9	17.9
Performance by Fee Quintile (Trailing 10 Years)									
20th Percentile	20	75.0	4	100.0	11.7	12.3	11.4	12.6	20.0
40th Percentile	21	71.4	2	100.0	9.5	12.7	10.9	12.3	23.8
60th Percentile	20	75.0	4	100.0	12.0	10.9	11.5	11.7	15.0
80th Percentile	22	81.8	4	75.0	12.7	13.4	11.8	13.1	36.4
100th Percentile	20	60.0	3	100.0	11.8	10.2	10.8	10.4	5.0

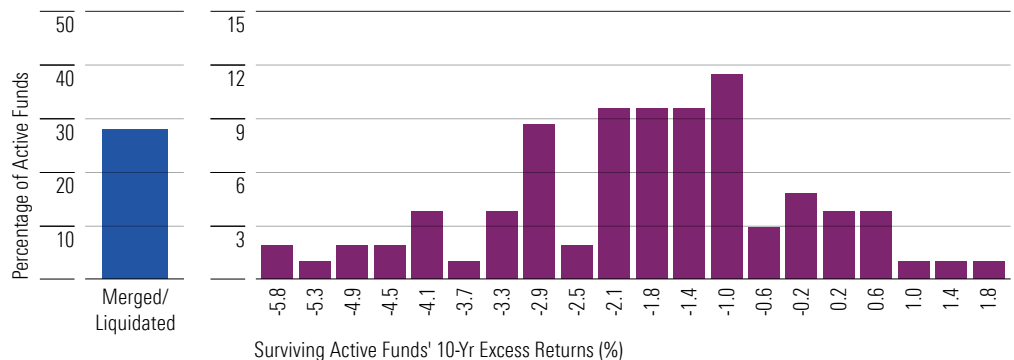
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 27 Rolling Success Rates for Surviving Active U.S. Small-Value Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 28 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Small-Value Funds



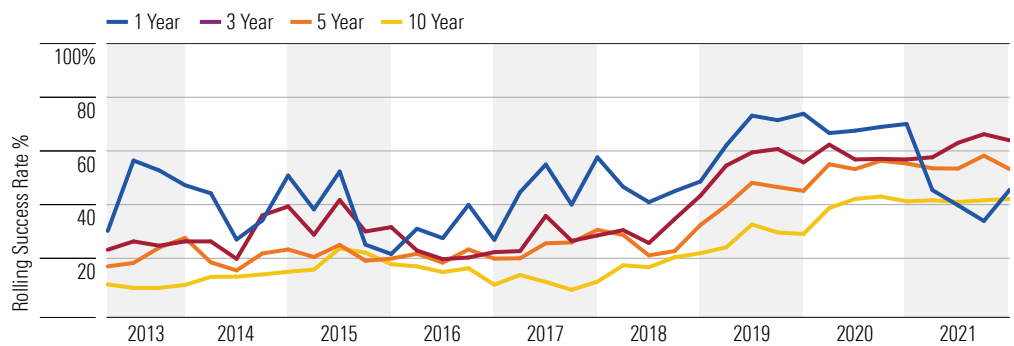
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 29 U.S. Small Growth

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	173	96.0	17	100.0	8.9	7.4	11.7	11.4	47.4
3-Year	202	87.1	15	100.0	24.4	22.4	26.0	21.2	65.8
5-Year	205	82.0	15	100.0	18.4	15.7	17.9	14.7	55.1
10-Year	216	63.0	13	100.0	15.6	14.6	15.4	13.9	44.0
15-Year	272	44.1	11	81.8	11.1	10.6	10.8	10.1	27.9
20-Year	225	43.6	5	80.0	10.1	10.3	10.0	10.4	12.9
Performance by Fee Quintile (Trailing 10 Years)									
20th Percentile	43	69.8	2	100.0	16.9	14.4	15.4	14.7	48.8
40th Percentile	43	69.8	2	100.0	15.1	14.5	15.2	14.7	46.5
60th Percentile	44	56.8	3	100.0	14.5	14.4	15.3	14.4	43.2
80th Percentile	42	57.1	2	100.0	14.7	14.4	14.7	14.7	33.3
100th Percentile	43	60.5	3	100.0	15.9	11.3	16.4	11.4	48.8

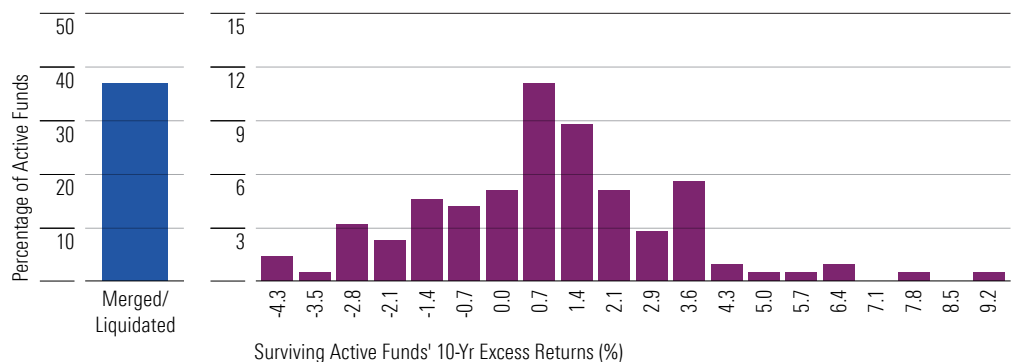
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 30 Rolling Success Rates for Surviving Active U.S. Small-Growth Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 31 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Small-Growth Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Foreign Stock

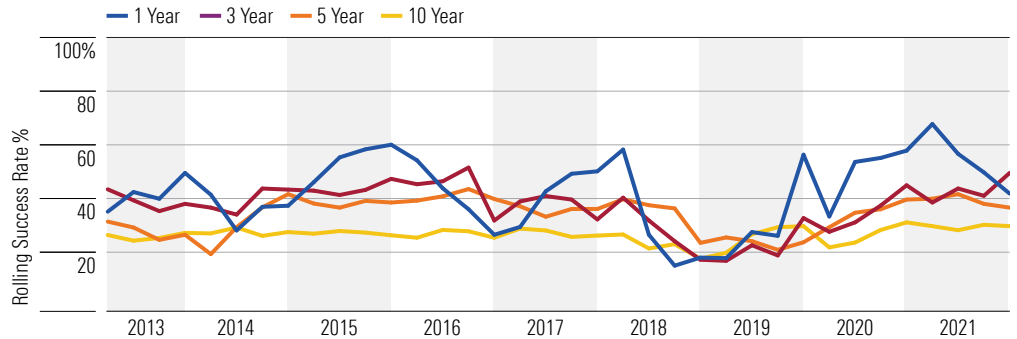
- ▶ One-year success rates fell in four of the six foreign stock categories included in our analysis. Active managers' 2021 success rate across these categories was 37%.
- ▶ As of April 30, 2021, the world large-stock category was broken into three separate categories: world large-stock value, world large-stock blend, and world large-stock growth. These new categories better capture the diverse strategies plied by managers that belonged to the legacy category. The current and historical figures presented in this analysis reflect the present and past composition of the new world large-stock blend category.
- ▶ The foreign-stock categories tend to be more target rich for active managers. At 36.8%, foreign stock funds' 10-year active success rate was materially higher than that of U.S. stock funds (18.1%).
- ▶ The median 10-year excess return for surviving active managers was positive in three of the six foreign-stock categories we examined—a much more appealing payout profile for investors relative to U.S. stock funds.
- ▶ The difference between 10-year asset-weighted returns for passive and active funds in four of the six foreign stock categories was negative. This indicates that investors generally achieved better outcomes with active funds within these categories.

Exhibit 32 Foreign Large Blend

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	190	94.7	101	97.0	10.6	9.9	9.5	10.5	43.7
3-Year	177	84.7	88	94.3	14.5	13.7	13.8	12.9	51.4
5-Year	179	78.2	74	89.2	9.5	9.8	9.7	9.5	38.5
10-Year	187	63.6	40	75.0	9.3	7.9	8.1	7.9	31.6
15-Year	172	45.9	24	50.0	5.0	3.6	4.0	3.4	29.1
20-Year	164	40.2	21	33.3	7.3	6.5	6.6	6.2	23.2
Performance by Fee Quintile									
(Trailing 10 Years)									
20th Percentile	35	62.9	7	85.7	10.6	7.9	9.0	7.9	48.6
40th Percentile	38	78.9	9	66.7	9.0	7.9	8.1	7.7	39.5
60th Percentile	36	66.7	8	62.5	8.5	7.9	7.7	7.6	19.4
80th Percentile	37	59.5	7	85.7	8.2	7.7	8.2	8.4	32.4
100th Percentile	38	47.4	8	75.0	7.1	7.6	7.5	7.8	18.4

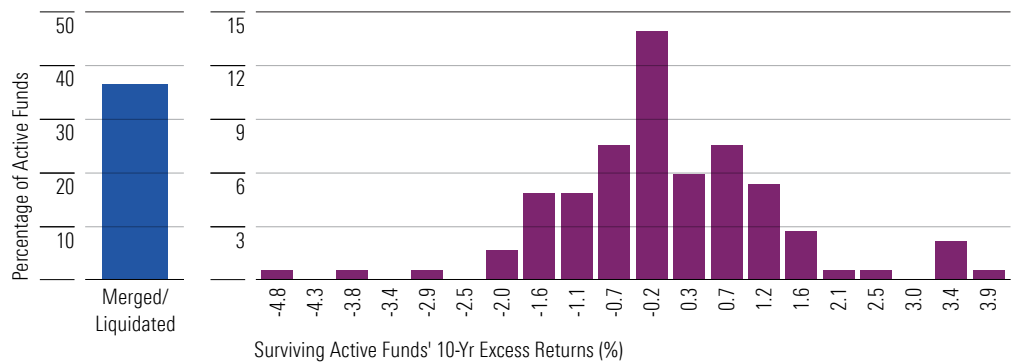
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 33 Rolling Success Rates for Surviving Active Foreign Large-Blend Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 34 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Foreign Large-Blend Funds



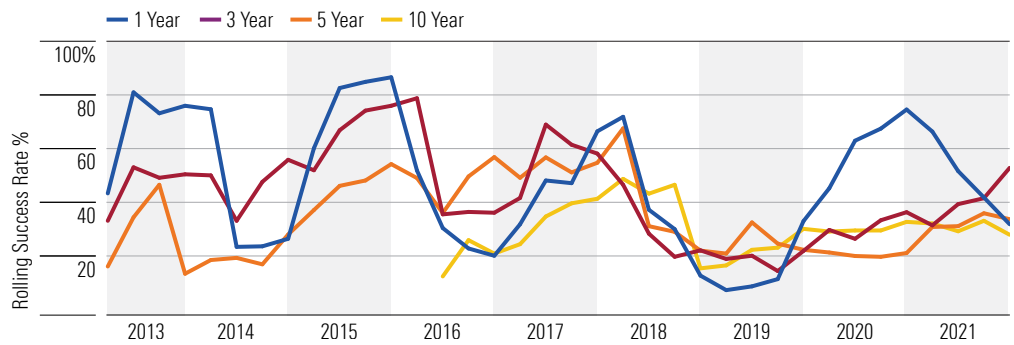
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 35 Foreign Large Value

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	89	93.3	35	100.0	12.2	12.7	11.5	12.4	33.7
3-Year	86	88.4	37	86.5	11.3	9.7	10.6	9.5	54.7
5-Year	101	75.2	33	75.8	7.7	6.8	7.0	6.7	35.6
10-Year	104	63.5	14	78.6	7.7	6.1	6.9	6.5	29.8
15-Year	79	58.2	4	75.0	3.5	2.6	2.9	3.4	11.4
Performance by Fee Quintile (Trailing 10 Years)									
20th Percentile	21	61.9	2	100.0	7.5	4.6	6.6	4.6	28.6
40th Percentile	21	71.4	3	66.7	6.3	6.3	6.7	6.2	33.3
60th Percentile	20	60.0	2	100.0	7.8	5.4	6.8	6.1	30.0
80th Percentile	20	80.0	3	100.0	9.6	9.2	7.2	7.4	40.0
100th Percentile	21	42.9	3	33.3	6.3	6.9	6.8	7.2	14.3

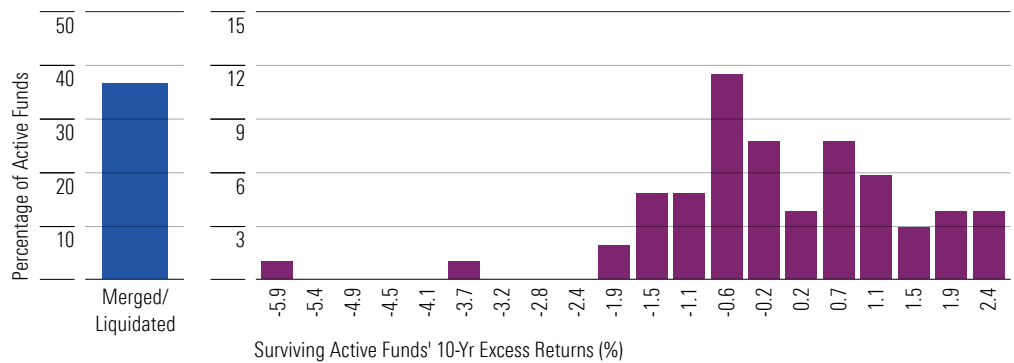
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 36 Rolling Success Rates for Surviving Active Foreign Large-Value Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 37 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Foreign Large-Value Funds



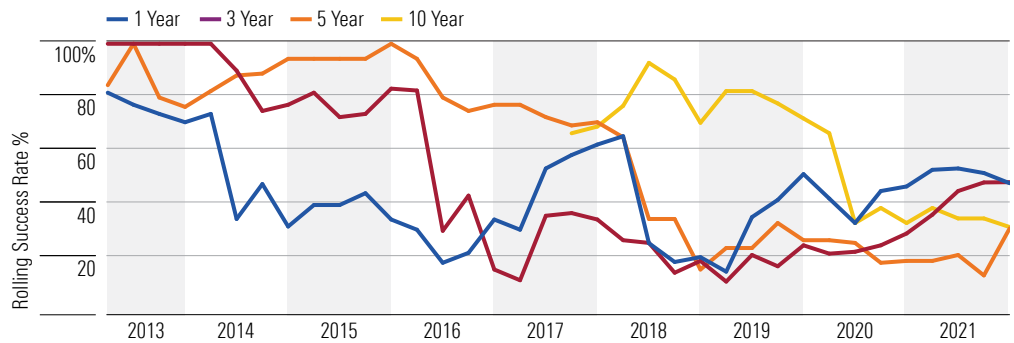
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 38 Foreign Small/Mid-Blend

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	27	85.2	8	100.0	13.4	11.1	11.2	11.9	48.1
3-Year	33	78.8	8	100.0	15.8	14.9	16.3	14.5	48.5
5-Year	32	68.8	9	88.9	9.8	10.2	10.5	9.9	31.3
10-Year	22	54.5	10	60.0	8.0	9.5	9.5	9.3	31.8
Performance by Fee Quintile (Trailing 10 Years)									
20th Percentile	4	75.0	1	100.0	9.9	8.6	10.0	8.6	75.0
40th Percentile	4	25.0	2	50.0	8.3	10.7	9.0	10.7	—
60th Percentile	4	50.0	2	50.0	6.2	11.0	6.5	11.5	—
80th Percentile	4	75.0	2	100.0	9.0	8.5	9.3	8.3	25.0
100th Percentile	5	40.0	2	—	11.6	-2.1	11.7	—	40.0

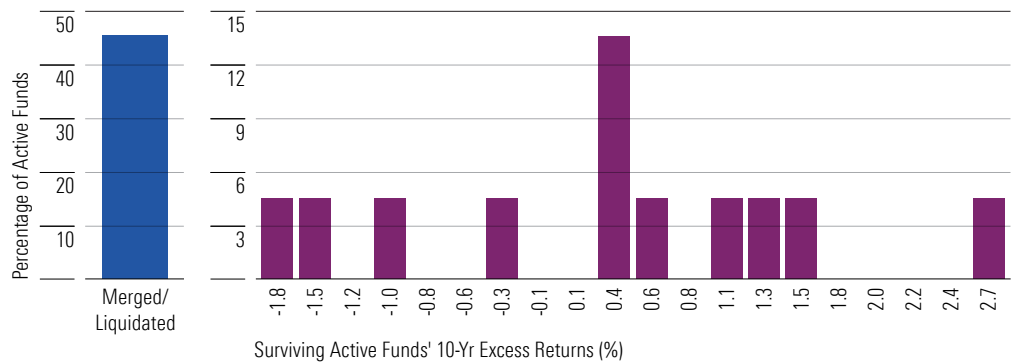
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 39 Rolling Success Rates for Surviving Active Foreign Small/Mid-Blend Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 40 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Foreign Small/Mid-Blend Funds



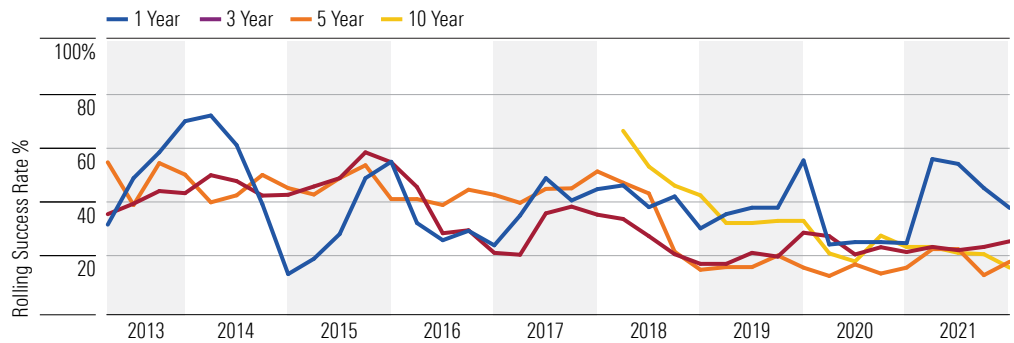
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 41 World Large-Blend

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	95	92.6	24	95.8	16.3	18.3	17.4	19.2	38.9
3-Year	83	91.6	20	95.0	18.7	19.6	18.3	20.1	26.5
5-Year	74	91.9	17	100.0	13.1	14.1	12.6	14.3	18.9
10-Year	48	91.7	6	100.0	11.1	12.1	10.8	12.5	16.7
Performance by Fee Quintile (Trailing 10 Years)									
20th Percentile	9	100.0	1	100.0	8.3	12.1	9.0	12.1	22.2
40th Percentile	9	88.9	1	100.0	11.6	12.0	11.5	12.0	11.1
60th Percentile	10	100.0	1	100.0	11.1	13.1	11.1	13.1	20.0
80th Percentile	9	88.9	1	100.0	11.4	12.9	11.4	12.9	22.2
100th Percentile	10	80.0	1	100.0	11.6	11.5	10.7	11.5	10.0

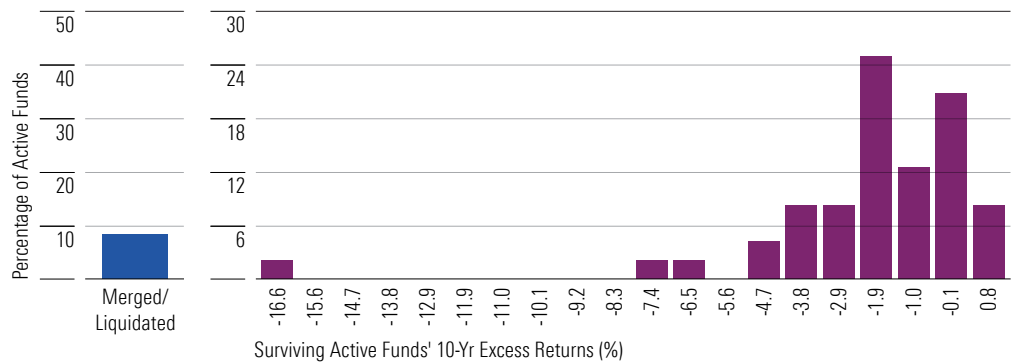
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 42 Rolling Success Rates for Surviving Active World Large-Blend Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 43 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active World Large-Blend Fund



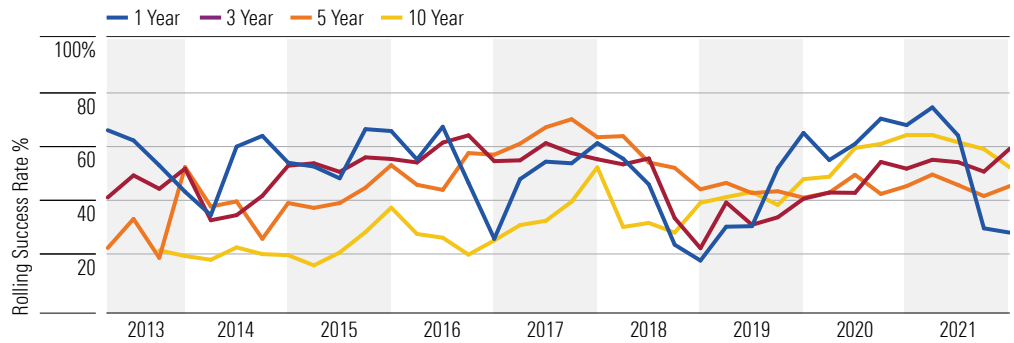
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 44 Diversified Emerging Markets

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	219	95.0	77	98.7	-1.8	—	-0.1	1.7	30.1
3-Year	235	84.7	76	80.3	12.7	11.0	13.5	10.0	61.3
5-Year	232	73.3	66	75.8	10.4	9.4	10.6	8.8	47.4
10-Year	149	69.8	39	66.7	6.1	5.0	6.0	4.3	54.4
15-Year	81	69.1	4	100.0	4.5	4.1	4.1	3.7	40.7
Performance by Fee Quintile (Trailing 10 Years)									
20th Percentile	29	89.7	8	87.5	5.8	4.8	5.9	4.1	69.0
40th Percentile	30	70.0	8	62.5	7.1	3.9	5.8	4.0	50.0
60th Percentile	29	72.4	6	66.7	6.0	4.8	6.2	5.5	55.2
80th Percentile	30	53.3	8	37.5	5.1	4.7	5.6	4.9	43.3
100th Percentile	30	63.3	8	75.0	6.0	4.0	6.6	3.2	53.3

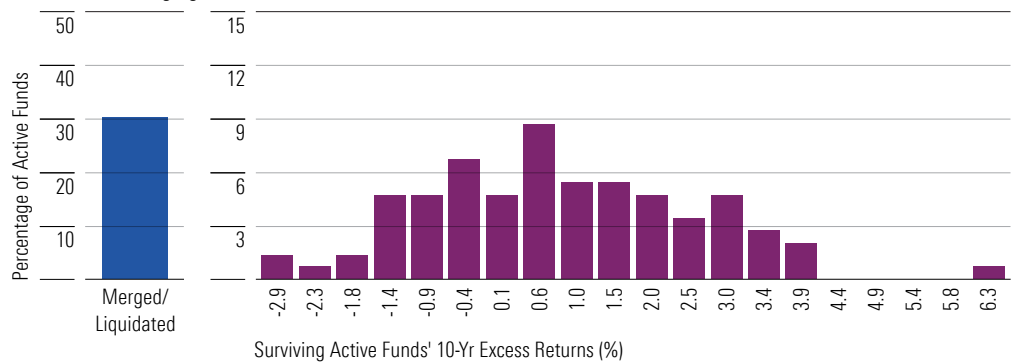
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 45 Rolling Success Rates for Surviving Active Diversified Emerging-Markets Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 46 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Diversified Emerging-Markets Funds



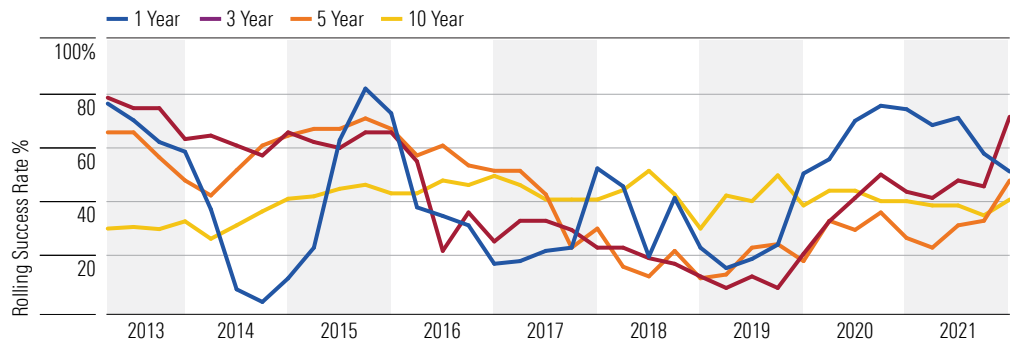
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 47 Europe Stock

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	15	100.0	29	93.1	15.2	16.4	17.1	17.7	53.3
3-Year	19	89.5	37	73.0	16.0	15.2	18.7	14.9	73.7
5-Year	22	72.7	41	58.5	9.5	10.1	11.6	10.0	50.0
10-Year	28	57.1	33	75.8	8.5	7.9	9.6	7.9	42.9
15-Year	29	51.7	17	94.1	4.0	3.4	4.4	3.1	37.9
20-Year	55	23.6	15	93.3	6.9	6.0	9.1	6.6	21.8
Performance by Fee Quintile (Trailing 10 Years)									
20th Percentile	5	80.0	8	75.0	10.1	8.2	11.2	7.7	80.0
40th Percentile	5	40.0	9	100.0	8.2	7.5	8.9	9.4	40.0
60th Percentile	6	50.0	3	66.7	7.3	7.4	8.5	8.9	16.7
80th Percentile	5	60.0	5	60.0	9.8	7.2	10.6	5.9	60.0
100th Percentile	6	50.0	7	57.1	8.1	5.6	6.3	5.1	16.7

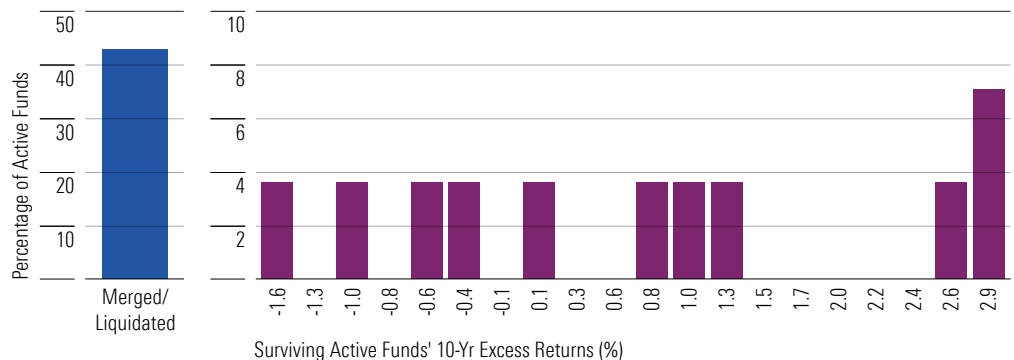
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 48 Rolling Success Rates for Surviving Active Europe-Stock Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 49 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Europe-Stock Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Real Estate

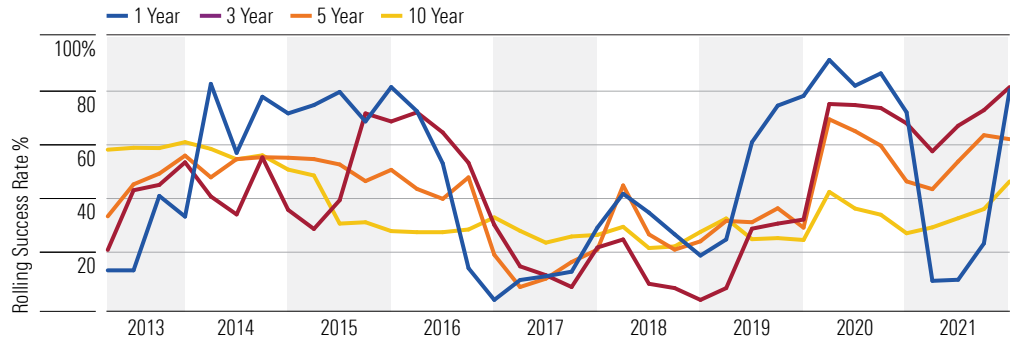
- ▶ At 41%, the 20-year success rate of actively-managed real estate funds is significantly higher than that for U.S. stock funds (10.8%), foreign stock funds (22.8%) and bond funds (8.8%).
- ▶ Success rates in the global real estate category fluctuate dramatically over shorter time horizons. This owes to the diversity of funds within the category. Some invest exclusively outside the United States, while others are more truly global. Thus, differences in performance between U.S. and ex-U.S. real estate securities will cause active managers' success rates to ebb and flow.

Exhibit 50 U.S. Real Estate

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	57	98.2	31	96.8	38.8	39.9	39.4	37.8	82.5
3-Year	61	93.4	26	88.5	19.5	18.9	20.1	15.8	83.6
5-Year	67	83.6	23	91.3	11.5	10.8	11.5	9.5	64.2
10-Year	66	78.8	15	66.7	11.3	11.2	11.1	10.6	48.5
15-Year	74	63.5	5	80.0	6.7	6.8	6.5	6.5	27.0
20-Year	56	55.4	5	80.0	10.6	10.1	10.5	9.7	41.1
Performance by Fee Quintile									
(Trailing 10 Years)									
20th Percentile	14	78.6	2	100.0	11.4	11.4	11.1	10.6	50.0
40th Percentile	12	58.3	3	66.7	9.3	10.8	10.8	10.9	41.7
60th Percentile	13	76.9	8	62.5	11.7	10.4	11.6	10.3	61.5
80th Percentile	13	84.6	—	—	11.7	—	11.2	—	53.8
100th Percentile	13	92.3	1	100.0	10.9	10.6	10.5	10.6	30.8

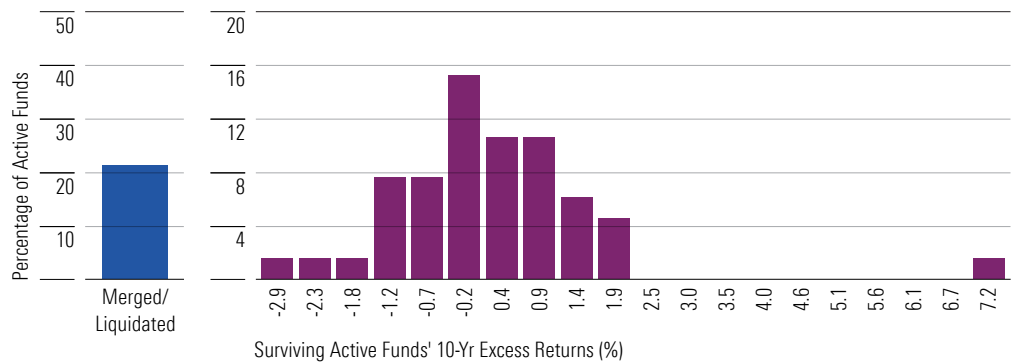
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 51 Rolling Success Rates for Surviving Active U.S. Real Estate Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 52 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active U.S. Real Estate Funds



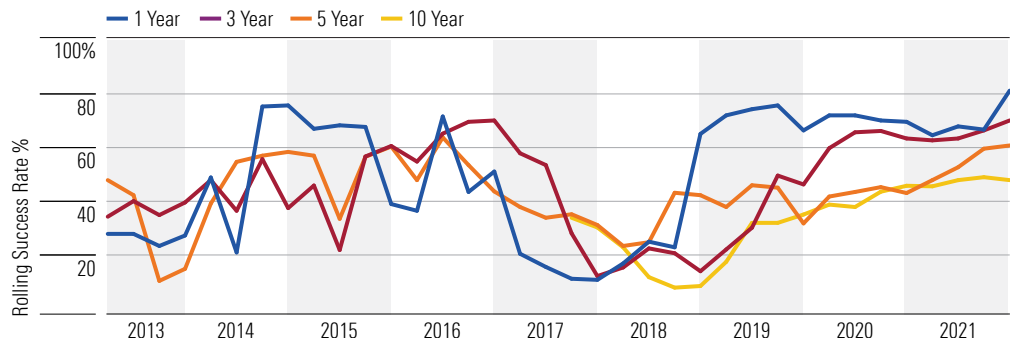
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 53 Global Real Estate

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	48	95.8	11	100.0	24.7	15.4	24.7	16.8	83.3
3-Year	54	83.3	13	92.3	13.5	8.8	14.1	9.3	72.2
5-Year	62	75.8	16	81.3	9.1	5.2	9.5	6.2	62.9
10-Year	48	66.7	11	81.8	9.1	7.4	9.1	7.8	50.0
Performance by Fee Quintile (Trailing 10 Years)									
20th Percentile	9	55.6	4	50.0	7.6	7.1	9.0	7.3	33.3
40th Percentile	9	77.8	—	—	9.5	—	8.9	—	66.7
60th Percentile	10	50.0	2	100.0	8.7	8.7	8.4	8.9	30.0
80th Percentile	9	88.9	2	100.0	9.5	6.9	9.5	7.5	66.7
100th Percentile	10	60.0	2	100.0	9.5	7.4	9.2	7.5	50.0

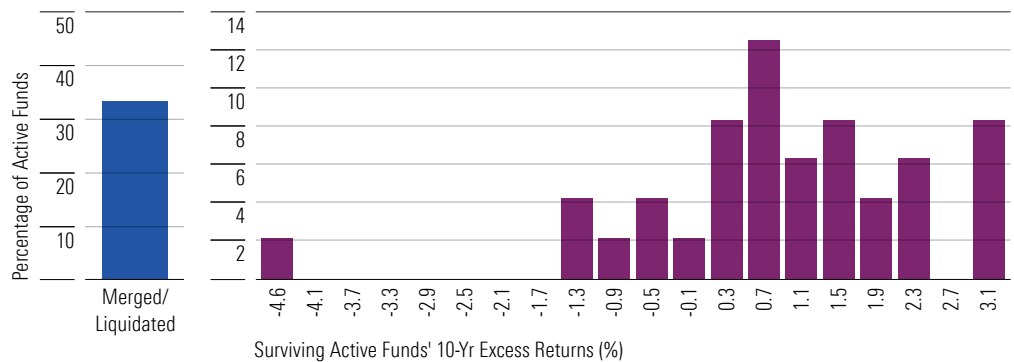
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 54 Rolling Success Rates for Surviving Active Global Real Estate Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 55 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Global Real Estate Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Fixed Income

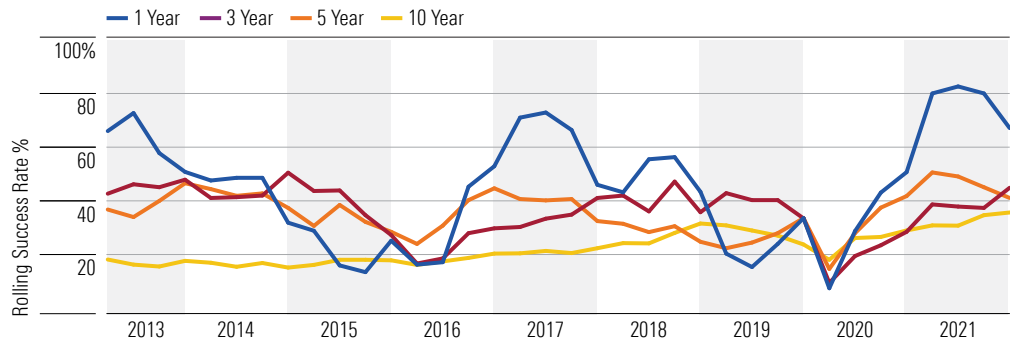
- ▶ Rising interest rates lifted active bond funds' 2021 success rate. Active funds generally took less interest-rate risk than their indexed peers, and their average losses were relatively muted as a result.
- ▶ The one-year success rate for active bond funds across the three fixed-income categories included in our analysis was almost 70%.
- ▶ Long-term success rates in the intermediate core bond category are generally lower than they were for the legacy category, which was more expansive and included active funds that had the latitude to take significantly more credit risk than their indexed peers. The passive funds in the category are now more representative of the opportunity set available to their active counterparts and thus a higher hurdle for core bond managers who hew more closely to standard benchmarks.

Exhibit 56 Intermediate Core Bond

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	120	96.7	30	100.0	-1.1	-1.7	-1.4	-1.9	69.2
3-Year	115	88.7	29	93.1	5.2	4.8	4.6	4.6	47.0
5-Year	132	74.2	27	92.6	3.8	3.5	3.4	3.2	43.2
10-Year	172	52.3	27	81.5	3.2	2.8	2.9	2.5	37.8
15-Year	218	33.9	16	50.0	3.5	4.0	3.8	3.9	17.0
20-Year	204	22.5	16	31.3	3.8	4.2	4.0	4.3	8.8
Performance by Fee Quintile									
(Trailing 10 Years)									
20th Percentile	31	67.7	6	100.0	3.3	2.9	2.9	2.8	54.8
40th Percentile	35	51.4	4	100.0	3.2	2.8	3.0	2.5	37.1
60th Percentile	33	54.5	5	60.0	3.1	2.2	2.8	2.5	45.5
80th Percentile	34	47.1	5	60.0	3.1	2.7	3.0	2.5	26.5
100th Percentile	34	35.3	6	83.3	3.1	2.5	2.7	2.2	20.6

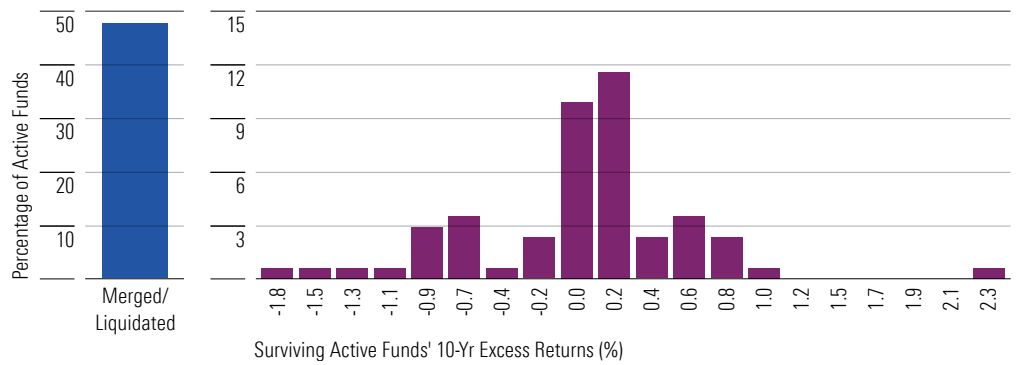
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 57 Rolling Success Rates for Surviving Active Intermediate Core Bond Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 58 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Intermediate Core Bond Funds



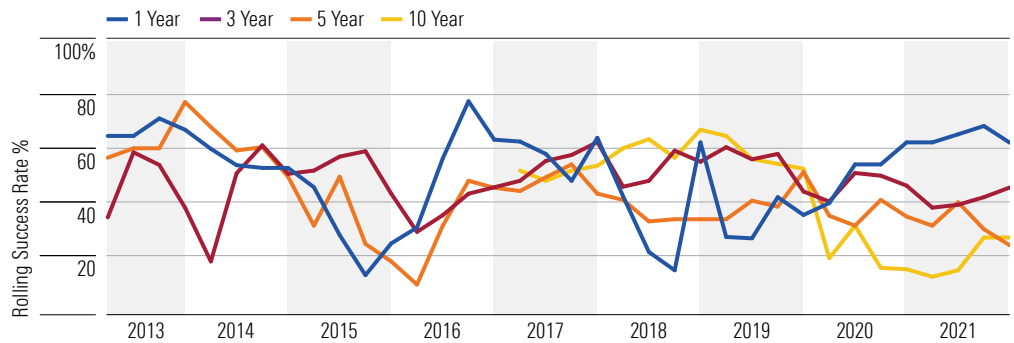
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 59 Corporate Bond

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	53	96.2	23	100.0	-1.0	-1.6	-0.6	-1.2	64.2
3-Year	59	88.1	29	93.1	7.9	7.9	7.4	7.4	47.5
5-Year	50	92.0	27	66.7	5.6	5.2	5.1	5.4	26.0
10-Year	38	84.2	14	78.6	5.2	4.7	4.6	4.9	28.9
Performance by Fee Quintile (Trailing 10 Years)									
20th Percentile	3	100.0	1	100.0	5.1	5.1	5.0	5.1	33.3
40th Percentile	7	85.7	3	100.0	6.7	3.9	4.9	4.9	28.6
60th Percentile	8	50.0	4	100.0	4.4	4.2	4.2	4.8	12.5
80th Percentile	7	100.0	1	100.0	5.1	3.3	4.3	3.3	28.6
100th Percentile	8	87.5	3	—	4.9	1.4	4.9	—	25.0

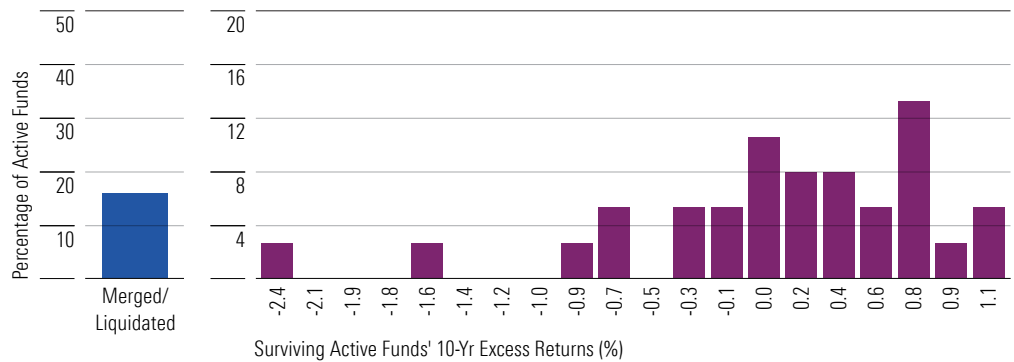
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 60 Rolling Success Rates for Surviving Active Corporate Bond Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 61 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active Corporate Bond Funds



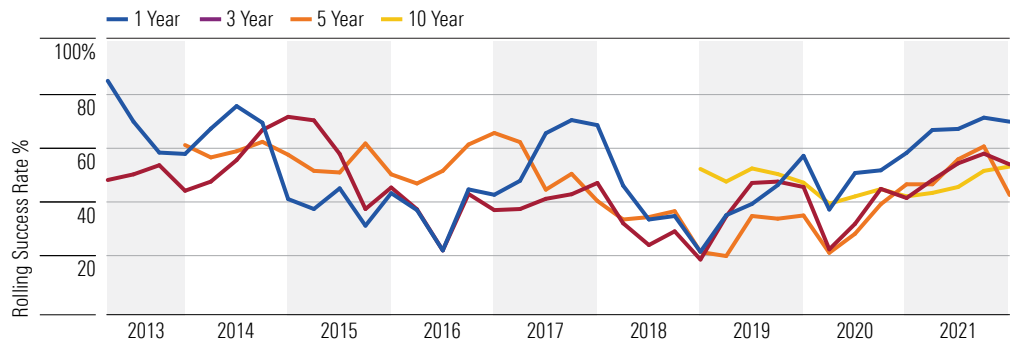
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 62 High-Yield Bond

	Active Funds		Passive Funds		Asset-Weighted Performance		Equal-Weighted Performance		Active Success Rate (%)
	# at Beginning of Period	Survivorship Rate (%)	# at Beginning of Period	Survivorship Rate (%)	Active (%)	Passive (%)	Active (%)	Passive (%)	
Trailing Total Return									
1-Year	182	97.3	45	93.3	5.7	4.5	5.2	3.8	72.0
3-Year	189	89.9	37	81.1	8.3	7.3	7.6	7.3	56.1
5-Year	199	81.4	20	70.0	5.7	5.1	5.2	5.1	44.7
10-Year	150	79.3	8	50.0	6.2	5.4	5.7	5.3	55.3
Performance by Fee Quintile (Trailing 10 Years)									
20th Percentile	26	84.6	4	—	6.6	1.6	6.3	—	76.9
40th Percentile	30	83.3	—	—	6.0	—	5.7	—	63.3
60th Percentile	30	80.0	4	—	5.1	1.6	5.4	—	43.3
80th Percentile	30	73.3	2	100.0	6.4	5.5	5.9	5.3	56.7
100th Percentile	30	76.7	1	100.0	5.9	5.2	5.2	5.2	36.7

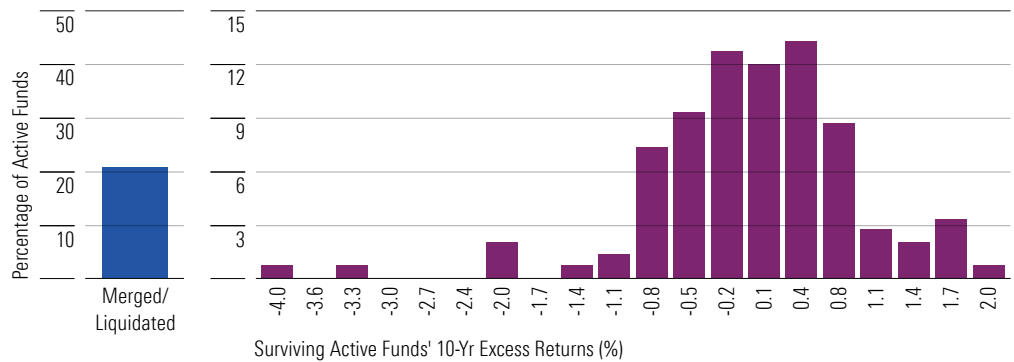
Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 63 Rolling Success Rates for Surviving Active High-Yield Bond Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Exhibit 64 Mortality and Distribution of 10-Year Annualized Excess Returns for Surviving Active High-Yield Bond Funds



Source: Morningstar. Data and calculations as of Dec. 31, 2021.

Appendix A**Summary of Updated Results for the Periods Ended June 30, 2021, and Dec. 31, 2020****Exhibit 65** Summary Results for the Period Ended June 30, 2021

Category	Active Funds' Success Rates by Category (%)						10-Year	10-Year
	1-Year	3-Year	5-Year	10-Year	15-Year	20-Year	(Lowest Cost)	(Highest Cost)
U.S. Large Blend	34.1	26.0	14.9	8.2	11.0	10.1	15.9	4.3
U.S. Large Value	47.8	28.4	18.2	12.7	13.6	16.5	24.6	6.6
U.S. Large Growth	42.3	42.5	28.2	9.5	8.4	7.0	18.2	4.5
U.S. Mid Blend	25.2	23.3	14.0	11.6	7.0	7.3	28.0	8.0
U.S. Mid Value	78.9	48.2	43.0	12.5	37.4	—	21.7	20.0
U.S. Mid Growth	38.1	57.3	52.8	39.3	26.3	—	41.9	34.1
U.S. Small Blend	37.5	21.1	17.7	14.9	10.4	25.2	27.8	13.9
U.S. Small Value	46.1	31.9	25.6	22.2	28.1	—	10.5	15.0
U.S. Small Growth	71.9	58.7	57.2	43.1	29.5	—	52.4	51.2
Foreign Large Blend	59.7	46.8	41.5	33.0	28.8	23.5	41.7	17.9
Foreign Large Value	76.4	38.2	23.0	34.6	—	—	31.8	22.7
Foreign Small-Mid Blend	46.9	29.4	19.2	33.3	—	—	66.7	50.0
World Large Blend	25.8	22.5	16.7	24.4	—	—	12.5	11.1
Diversified Emerging Markets	70.1	53.9	47.4	66.4	38.0	—	78.3	54.5
Europe Stock	76.5	45.8	28.6	42.3	38.7	17.2	80.0	20.0
U.S. Real Estate	74.2	70.1	48.5	29.2	25.7	14.5	33.3	20.0
Global Real Estate	71.7	65.5	45.2	47.9	—	—	37.5	50.0
Intermediate Core Bond	52.8	30.6	43.9	31.1	14.2	6.5	46.7	16.7
Corporate Bond	64.3	48.2	36.7	17.1	—	—	—	14.3
High-Yield Bond	60.4	43.6	48.7	44.2	—	—	73.1	24.1

Source: Morningstar. Calculations as of June 30, 2021.

Exhibit 66 Morningstar's U.S. Active/Passive Barometer Results for the Period Ended Dec. 31, 2020

Category	Active Funds' Success Rates by Category (%)						10-Year	10-Year
	1-Year	3-Year	5-Year	10-Year	15-Year	20-Year	(Lowest Cost)	(Highest Cost)
U.S. Large Blend	39.2	27.4	13.3	8.9	11.0	10.1	15.9	4.3
U.S. Large Value	41.2	26.6	14.5	6.0	13.6	16.5	24.6	6.6
U.S. Large Growth	46.6	40.5	28.0	9.4	8.4	7.0	18.2	4.5
U.S. Mid Blend	33.9	26.1	14.8	15.7	7.0	7.3	28.0	8.0
U.S. Mid Value	71.6	48.1	31.4	21.9	37.4	—	21.7	20.0
U.S. Mid Growth	59.6	62.2	55.6	40.1	26.3	—	41.9	34.1
U.S. Small Blend	29.2	25.9	20.4	16.0	10.4	25.2	27.8	13.9
U.S. Small Value	41.6	27.0	31.9	34.0	28.1	—	10.5	15.0
U.S. Small Growth	69.4	58.7	55.1	44.0	29.5	—	52.4	51.2
Foreign Large Blend	55.5	33.0	36.6	25.5	28.8	23.5	41.7	17.9
Foreign Large Value	64.8	28.3	21.9	31.4	—	—	31.8	22.7
Foreign Small-Mid Blend	33.3	22.6	25.9	33.3	—	—	66.7	50.0
World Large Stock	26.2	21.6	17.9	19.0	—	—	12.5	11.1
Diversified Emerging Markets	63.1	44.9	51.6	61.6	38.0	—	78.3	54.5
Europe Stock	72.2	43.5	31.6	46.2	38.7	17.2	80.0	20.0
U.S. Real Estate	84.1	76.9	67.2	38.4	25.7	14.5	33.3	20.0
Global Real Estate	74.1	67.8	45.6	40.0	—	—	37.5	50.0
Intermediate Core Bond	30.9	21.6	30.1	28.3	14.2	6.5	46.7	16.7
Corporate Bond	56.1	52.9	33.3	33.3	—	—	—	14.3
High-Yield Bond	52.9	34.0	30.3	44.2	—	—	73.1	24.1

Source: Morningstar. Calculations as of Dec. 31, 2020.

*This data appears as it was originally presented for the legacy intermediate-term bond Morningstar Category.

Appendix B — Methodology

Data Source

Morningstar's U.S. open-end and exchange-traded funds database.

Universe

All ETFs and open-end mutual funds (excluding funds of funds and money market funds) in each Morningstar Category that existed at the beginning of the relevant period (including funds that did not survive to the end of the period) defined the eligible universe. To be included, the fund's inception date must precede the start of the period and the obsolete date cannot predate the start of the period. In addition, each must have asset data for at least one share class in the month prior to the start of the sample period (the beginning of the trailing one-, three-, five-, 10-, 15-, or 20-year period) to facilitate asset weighting.

Survivorship

To calculate survivorship, we divide the number of distinct funds (based on unique fund ID at the beginning of the period) that started and ended the period in question by the total number of funds that existed at the onset of the period in question (the beginning of the trailing one-, three-, five-, 10-, 15-, or 20-year period).

Asset-Weighted Returns

We calculate the asset-weighted returns for each cohort using each share class' monthly assets and returns. When a fund becomes obsolete, its historical data remains in the sample. Funds that incept or migrate into the category after the start of the period are not included.

Equal-Weighted Returns

In order to come up with a single return figure for funds with multiple share classes, we first calculate the asset-weighted average of all the fund's share classes. We then take the simple equal-weighted average of the monthly returns for each fund in the group and compound those returns over the sample period. As before, when a fund becomes obsolete, its historical data remains in the sample. Funds that incept or are moved into the category after the start of the period are not included.

Success Rate

The success rate indicates what percentage of funds that started the sample period went on to survive and generate a return in excess of the equal-weighted average passive fund return over the period. This approach differs from the convention of using a single, representative index to gauge success. We do not consider magnitude of outperformance in defining success: A fund that just barely beat the passive alternative counts as much as a fund that significantly outperformed.

As in the equal-weighted return calculation, we calculate the asset-weighted average of all the fund's share classes to come up with a single return figure for funds with multiple share classes. We then rank the funds by their composite returns, count the number that rank higher than the equal-weighted average return for the passive funds in the category, and divide that number by the number of funds at the beginning of the period (using the same number from the denominator of the survivorship calculations).

Fees

We rank each fund by its annual report expense ratio from the year prior to the start of the sample period and group them into quintiles. We then apply the same steps described above to calculate the success rates for funds in each quintile. To be counted in the starting number of funds used for purposes of calculating the survivorship and success rates, each fund must have an annual report expense ratio at the beginning of the sample period.

Excess Returns

We measure surviving active funds' excess returns relative to the equal-weighted average passive fund return in each category.

Appendix C—How Our Approach Compares With Others'

How is our approach different from others'?

Our "benchmark" for measuring success is different than others'. We measure active managers' success relative to investable passive alternatives in the same category. For example, an active manager in the U.S. large-blend category is measured against a composite of the performance of its index mutual fund and ETF peers (for example, Vanguard Total Stock Market Index VTSMX, SPDR S&P 500 ETF SPY, and so on). Specifically, we calculate the equal- and asset-weighted performance of the cohort of index-tracking (that is, "passive") options in each category that we examine and use that figure as the hurdle that defines success or failure for the active funds in the same category. The magnitude of outperformance or underperformance does not influence the success rate. However, this data is reflected in the average return figures for the funds in each group, which we report separately.

We believe this is a better benchmark because it reflects the performance of actual investable options and not an index. One cannot directly invest in indexes. Their performance does not account for the real costs associated with replicating their performance and packaging and distributing them in an investable format. Also, the success rate for active managers can vary depending on one's choice of benchmark. For example, the rate of success among U.S. large-blend fund managers may vary depending on whether one uses the S&P 500 or the Russell 1000 Index as the basis for comparison. By using a composite of investable alternatives within funds' relevant categories as our benchmark, we account for the frictions involved in index investing (fees, as well as others) and we mitigate the effects that might stem from cherry-picking a single index as a benchmark. The net result is a much fairer comparison of how investors in actively managed funds have fared relative to those who have opted for a passive approach.

We measure each fund's performance based on the asset-weighted average performance of all of its share classes in calculating success rates. This approach reflects the experience of the average dollar invested in each fund. We then rank these composite fund returns from highest to lowest and count the number of funds with returns exceeding the equal-weighted average of the passive funds in the category. The success rates are defined as the ratio of these figures to the number of funds that existed at the beginning of the period. Given this unique approach, our field of study is narrower than others, as the universe of categories that contained a sufficient set of investable index-tracking funds was fairly narrow at the end of 2004. We expect the number of categories we include in this study will expand over time.

We cut along the lines of cost. Cost matters. Fees are the one of the best predictors of future fund performance. We have sliced our universe into fee quintiles to highlight this relationship. ■■