Finding Bond Funds That Can Beat Their Benchmarks After Fees

High Fees Eat Away at Bond Funds' Excess Returns.

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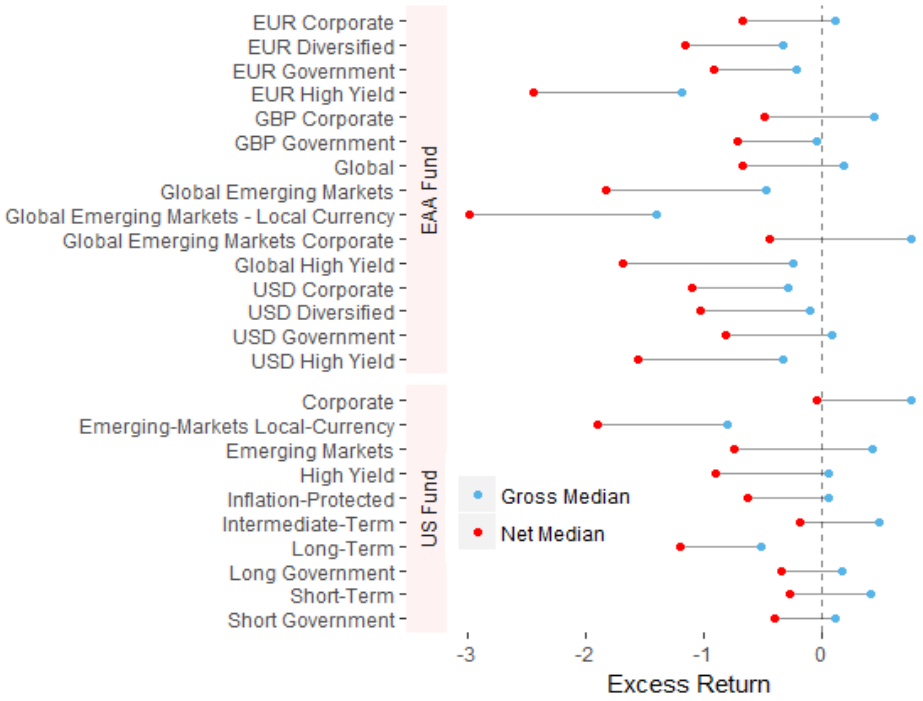
Executive Summary

The typical active fixed-income fund manager struggles to beat the fund's benchmark after fees. As low-cost passive options become more readily available in the fixed-income space, investors need to be able to assess the relative merits of active and passive bond funds to make informed investment decisions. What are an investor's odds of selecting an active fund that is likely to outperform its benchmark after fees, and in which categories is it preferable to choose a low-cost passive option instead?

To answer these questions, this study presents a framework of expected excess returns for fixed-income funds based on historical excess return distributions in 25 Morningstar Categories. The study spans a period of nearly 16 years, January 2002 to October 2017, and includes funds from Morningstar's Europe, Asia, and Africa (EAA) as well as US categories.

Results show that, although the median active manager can beat the benchmark in several categories before fees, success ratios drop dramatically after fees and fund mortality are taken into consideration. Categories fare considerably differently, however, in how funds perform against category benchmarks and passive investment vehicles.

Exhibit 1 Annualized Gross and Net Excess Returns for Category Medians, Rolling 3-Year Periods 2002–17 Against Morningstar Category Indexes

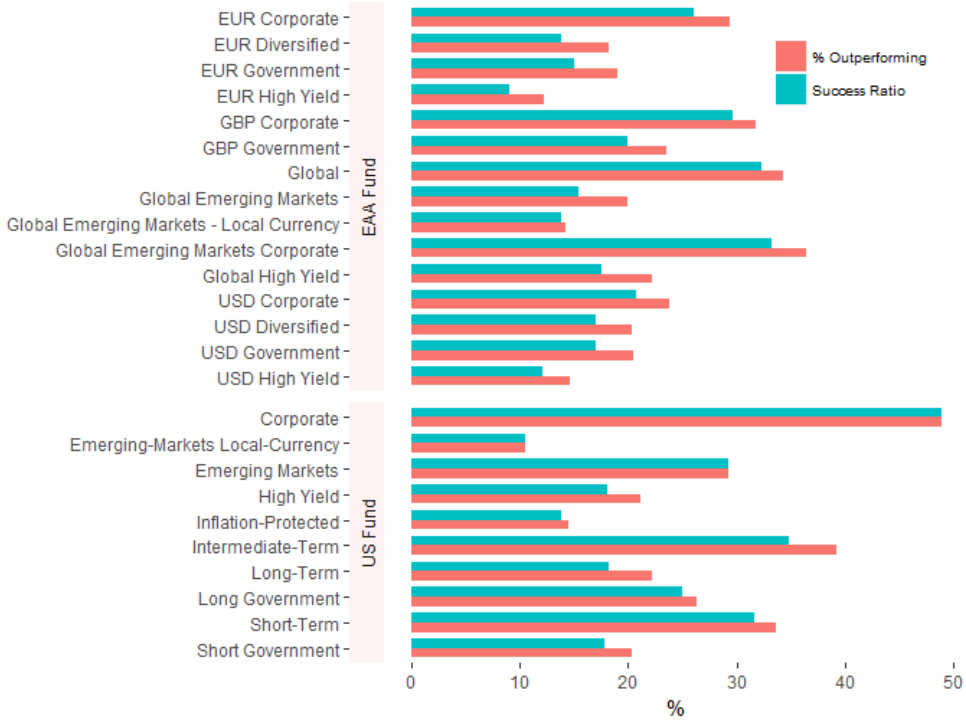


Source: Morningstar Direct. Data as of 31 Oct 2017.

Key Takeaways

- The largest explanatory factor for the chronic underperformance of bond funds versus their indexes is the impact of fees. As is shown in Exhibit 1, net-of-fees median returns were negative in all 25 categories studied.
- A further complication arises from fund mortality. The median success ratio, which consider the effects of fees and fund mergers and liquidations, ranged from 9% to 49%, as evidenced in Exhibit 2.
- There are large differences between categories, however. We identify three groups of categories in which gross excess returns move within a narrow, moderate, and wide range against the benchmark.
- In groups where dispersions are low, and the median fund tends to perform in line with the benchmark on a gross basis, the case for low-cost passive investing is strong.
- A group of slightly riskier category segments provides a more lucrative field for active managers, but wider dispersion between the best and the worst active funds poses challenges for active fund selection.
- In markets where transaction costs are particularly elevated, both active funds and ETFs have struggled to match the performance of the index. Investors may stand a better chance by choosing an active fund, but this requires stringent due diligence and a focus on fees.
- Fund mortality also weighs significantly on success ratios: over the past five years, survival rates in the categories covered by our study ranged from 39% to 94%, an additional challenge for investors looking to choose an active bond fund for the long term.

Exhibit 2 Probability of Outperformance and Success Ratios on a Net Basis, Rolling 3-Year Periods 2002–17 Against Morningstar Category Indexes



Source: Morningstar Direct. Data as of 31 Oct 2017.

Methodology

We analyze patterns of fund performance against category benchmarks and passive options on a gross and net-of-fees basis with a data set that goes back to January 2002 with an end date on 31 Oct 2017 (15 years and 10 months, or 190 months). This period includes different market environments, such as the 2003–07 market boom, 2008–09 financial crisis, 2010–12 euro crisis, and the low-yield environment of recent years. We refrain from going back further in time to include a reasonable amount of funds from Europe where the fixed-income fund industry matured later than in the US and data is thinner further back in time.

Our paper focuses on measuring performance with excess returns and alpha but does not include other measures of risk such as standard deviations or maximum drawdowns. It's possible that active managers stand a better chance of outperforming their benchmark indexes on other risk-adjusted measures than alpha, such as the Sharpe ratio. However, that would require a different depth of analysis to be reliably interpreted and thus could be the object of a future study.

Dataset and Metrics

The study includes all open-ended funds in Morningstar's database for 15 EEA (Europe, Africa, and Asia) and 10 US categories. Liquidated or merged funds that were alive for at least one three-year period within the time frame of the study (1 Jan 2002–31 Oct 2017) are included.[1] Studied categories are ones in which most funds use a similar benchmark to measure success. This allows one index (Morningstar Category Index[2]) to be plausibly used as a yardstick for all funds in the category, even though we recognize that the level of dispersion may be high in some categories studied. The dataset includes 5,133 open-end funds with 3,299 funds displaying a return for the most recent three-year period; others had been merged or liquidated before the end of October 2017.

For each category, we have identified the most representative exchange-traded available in our database–that is, the earliest-launched ETF that tracks the category index or, in cases where this was not possible, the earliest-launched ETF that tracks an index with a high overlap in constituents with the category index.[3]

We looked at performance through three metrics:

- *Gross return* calculations comparing share classes in each category against their respective category index.
- *Net returns* of our selected share classes compared against the index of each category.
- *Net returns* of our selected share classes against an ETF, that is, an investable version of the benchmark with fees.

1 We have settled on using rolling three-year periods as these reflect fixed-income investors' typical investment horizon. The use of rolling three-year periods also allows for a fairly high number of periods to be analyzed. (We have also analyzed five-year results, which were directionally similar to three-year numbers, though this yields a smaller sample size).

2 In Morningstar products, the data point is called "MPT Index" outside the US and "Morningstar Category Index" in the US market.

3 There are two cases in which this leads to significant differences with the category index. Within the EAA global bond category, we were unable to find an ETF tracking the BBgBarc Global Aggregate Bond index with a meaningful performance history and thus selected the government-only iShares Global Govt Bond index. Within the US short government bond category, we chose the iShares 1-3 Year Treasury Bond ETF as there was no vehicle tracking the BBgBarc Government 1-5 Year Index with a sufficiently long track record.

Net returns are based on each fund's net asset value as reported by fund companies, whereas gross returns are calculated from reported NAVs with fees added back based on each share class' historical fee ratios reported to Morningstar. We selected one share class to represent each fund, with a preference for retail share classes with longest history. In case of a tie, we chose the share class with more assets under management.

A key benefit of gross returns is that, in theory, the selection of a share class does not affect the results in the comparisons against benchmarks and passive options. (In practice, factors such as missing fee data or currency-hedging effects may drive gross returns to differ slightly.) They allow investors to determine how high a fee level they can tolerate without eroding their odds of outperforming.

We also calculated the following performance statistics for gross and net performance:

- *Excess return* = annualized fund gross or net returns subtracted from either index or ETF returns, respectively.
- *Alpha* = annualized excess returns after considering a fund's level of market risk (beta).
- *Beta* = a fund's level of risk from a linear regression.
- *R-Squared* = a measure of the fit of the linear regression.

Finally, we derived:

- *Success ratios*, which show the portion of funds that survive the period under analysis and outperform the category index. This calculation also allows us to tackle the question of fund mortality, which looms large, especially in Europe.

Regarding currency adjustments, we convert all return series (funds and indexes) to their respective category's currency.

To measure central tendency, we focus on analyzing medians, which are more robust to outliers, as opposed to means.

In addition, we employ rolling three-year measurement periods. Thus, if we calculate a median statistic per period, we derive a total of 154 medians per category over our time frame–that is, a distribution of median excess returns, alphas, and more. To measure the central tendency of this distribution of medians, we calculate the median again. We refer to a result produced from this summarization methodology as a median of medians in the text.

The dataset is summarized in Exhibit 3.

Exhibit 3 Morningstar Categories Included in the Study With Fund Counts for 3-Year Periods

Morningstar Category	Morningstar Category Index	ETF	Funds in Sample	Funds Latest 3 Years
EAA Fund EUR Corporate Bond	BBgBarc Euro Agg Corps TR EUR	iShares Core EUR Corp Bond	443	322
EAA Fund EUR Diversified Bond	BBgBarc Euro Agg Bond TR EUR	iShares EUR Aggregate Bond EUR Dis	1,095	635
EAA Fund EUR Government Bond	Citi EMU GBI EUR	db x-trackers II Eurozone Govt Bd (DR)1C	453	262
EAA Fund EUR High Yield Bond	BBgBarc Pan Euro HY Euro TR EUR	iShares EUR High Yield Corp Bond EUR Dis	168	118
EAA Fund GBP Corporate Bond	BBgBarc Sterling Agg Corp TR GBP	Vanguard UK Inv Grade Bd Idx GBP Acc	145	104
EAA Fund GBP Government Bond	Citi UK GBI GBP	iShares Core UK Gilts GBP Dist	80	51
EAA Fund Global Bond	BBgBarc Global Aggregate TR USD	iShares Global Govt Bond USD Dist	318	251
EAA Fund Global Emerging Markets Bond	JPM EMBI Global TR USD	iShares JP Morgan $ EM Bond USD Dist	215	150
EAA Fund Global Emerging Markets Bond - Local Currency	JPM GBI-EM Global Diversified TR USD	SPDR® Barclays Emerging Mkts Lcl Bd ET	134	109
EAA Fund Global Emerging Markets Corporate Bond	Morningstar EM Corp Bd TR USD	iShares $ EM Corp Bond USD Dist	63	55
EAA Fund Global High Yield Bond	BofAML Gbl HY Constd TR USD	iShares Global HY Corp Bd USD Dist	71	60
EAA Fund USD Corporate Bond	BBgBarc US Corp IG TR USD	iShares $ Corp Bond USD Dist	55	39
EAA Fund USD Diversified Bond	BBgBarc US Agg Bond TR USD	iShares US Aggregate Bond USD Dist	200	107
EAA Fund USD Government Bond	Citi US GBI USD	SPDR® Barclays US Treasury Bond ET	60	26
EAA Fund USD High Yield Bond	BBgBarc US Corporate High Yield TR USD	iShares $ High Yld Corp Bd USD Dist JDR	76	53
US Fund Corporate Bond	BBgBarc US Corp IG TR USD	iShares iBoxx $ Invst Grade Crp Bond	52	51
US Fund Emerging Markets Bond	JPM EMBI Global TR USD	iShares JPMorgan USD Emerg Markets Bond	91	77
US Fund Emerging-Markets Local-Currency Bond	BBgBarc EM Local Currency Govt TR USD	SPDR® Blmbg Barclays Em Mkts Lcl Bd ET	21	21
US Fund High Yield Bond	BofAML US HY Master II TR USD	iShares iBoxx $ High Yield Corporate Bd	321	198
US Fund Inflation-Protected Bond	BBgBarc US Treasury US TIPS TR USD	iShares TIPS Bond	75	65
US Fund Intermediate-Term Bond	BBgBarc US Agg Bond TR USD	iShares Core US Aggregate Bond	609	327
US Fund Long Government	BBgBarc US Government Long TR USD	Vanguard Long-Term Government Bond ETF	26	12
US Fund Long-Term Bond	BBgBarc US Govt/Credit Long TR USD	iShares Core 10+ Year USD Bond	56	19
US Fund Short Government	BBgBarc Government 1-5 Yr TR USD	iShares 1-3 Year Treasury Bond	74	35
US Fund Short-Term Bond	BBgBarc US Govt/Credit 1-5 Yr TR USD	iShares Core 1-5 Year USD Bond	232	152
Totals			**5,133**	**3,299**

Source: Morningstar Direct. Data as of 31 Oct 2017.

Why Do Fixed-Income Funds Underperform Their Benchmarks So Often?

Before going into our results, it's useful to consider the factors other than fees that lead fixed-income funds to so often trail their benchmarks.

The first factor is the weight of transaction costs. In contrast to equity indexes, which are often rebalanced annually or quarterly, the majority of bond indexes need to be rebalanced monthly to capture new bonds that are issued, others reaching maturity or being "called," and bonds that no longer comply

with the index's inclusion rules (for example, in the case of indexes that restrict themselves to a range of credit ratings, such as BB to B). This results in a significant level of index turnover: In the 2014–16 period, the average turnover rate for the Bloomberg Barclays US Aggregate Bond Index was 40% annualized. Half of the turnover resulted from new issuance. This is in stark contrast to an annual turnover rate of less than 5% for the S&P 500, where new stocks are generally less than 1% of the total market cap of the index.[4] A portfolio seeking to fully replicate the performance of the fixed-income index would incur significant transaction costs when buying and selling securities at each monthly rebalancing. However, the performance of the index itself ignores transaction costs, giving it a structural advantage. The effect is especially large in less-liquid areas of the market such as high yield or segments of emerging-markets debt, where transaction costs are higher, making it even more difficult to match the performance of the index. As we will see later in the paper, this also makes it more difficult for ETFs in these categories to track their indexes.

The second factor is more behavioral in nature, and it is linked to the challenges that the current environment of low yields poses for bond funds. While our study spans 15 years, that period has mostly been characterized by low interest rates, with only short bouts of moderate interest-rate hikes. In particular, the post-global-financial-crisis years have seen interest rates trend towards unprecedentedly low levels, which has led companies and governments to extend the maturity of their debt. As a result, the average maturity and duration of most bond indexes has trended upwards (for example, the Citi EMU GBI index, which is representative of eurozone sovereign bonds, had an average duration of 7.6 years as of 30 Sept 2017, compared with six years as of 30 Sept 2009). In this context, many bond managers have not been able or willing to increase the interest-rate risk of their portfolios to the level of the benchmarks. Indeed, our data shows that the average fund in most categories has a lower duration than the corresponding category index. Many fund managers—especially those with a cautious mandate or whose mandate includes capital protection—have sought to protect their portfolio from a sudden rise in interest rates, leading them to miss out on a large part of the performance of the index that has been driven by a broad decline in core government bond yields.

Despite these challenges, active fund managers have a wide set of tools at their disposal to add value against the benchmark. Managers can tactically adjust risk exposures in their portfolios (such as credit beta, country risk, currency risk, and duration), particularly thanks to the growing availability of derivative products such as futures and credit default swaps. They can also add value through security selection, and in many cases off-benchmark exposures (such as marginal exposure to high-yield debt in an investment-grade portfolio, or emerging-markets debt in a predominantly developed-markets portfolio). Indeed, as we will see in the following sections, there are several categories where the median active manager has been able to beat the category index on a gross-of-fees basis, though the margin of outperformance has often been slimmer in the recent low-yield environment and thus more likely to be eaten up by fees.

Effect of Fund Lineup Churn

Fund mergers and liquidations in providers' bond-fund lineups, especially frequent in Europe, reduce the proportion of funds that survive a period and do well against their benchmarks during the period. We discuss this effect in the final section.

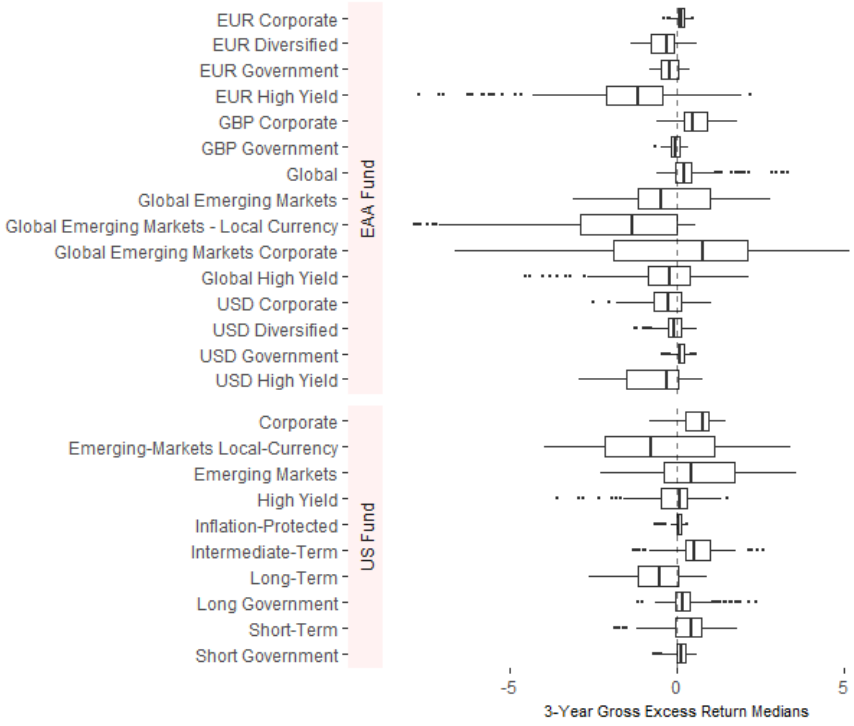
4 PIMCO 2017. "Bonds Are Different." https://www.pimco.com/en-us/insights/viewpoints/quantitative-research-and-analytics/bonds-are-different-active-versus-passive-management-in-12-points

Headline Results

We first look across medians of three-year rolling period gross *excess returns* in the 25 categories included in the study. As prefaced in the methodology section, we perform this analysis by calculating the median of funds' gross excess returns and then examining the median across categories. We find that the average category has a slightly negative gross excess median return of 0.07% annualized against the category index over the entire period 2002–17. (See Exhibit 20 in Appendix for category-level numbers.)

However, categories differ starkly in their profiles, both cross-sectionally and analyzed through time. Exhibit 4 displays the range within which the category median gross excess returns have moved through time in three-year periods. The box plot summarizes the distribution of three-year gross excess return median observations between the 25th and 75th percentiles of the distribution in each category since January 2002, while the "whiskers" represent outliers with a maximum of 1.5 times the interquartile range. Dots are outliers outside this range.

Exhibit 4 Gross Excess Return Medians in Rolling 3-Year Periods 2002–17 Against Morningstar Category Benchmarks



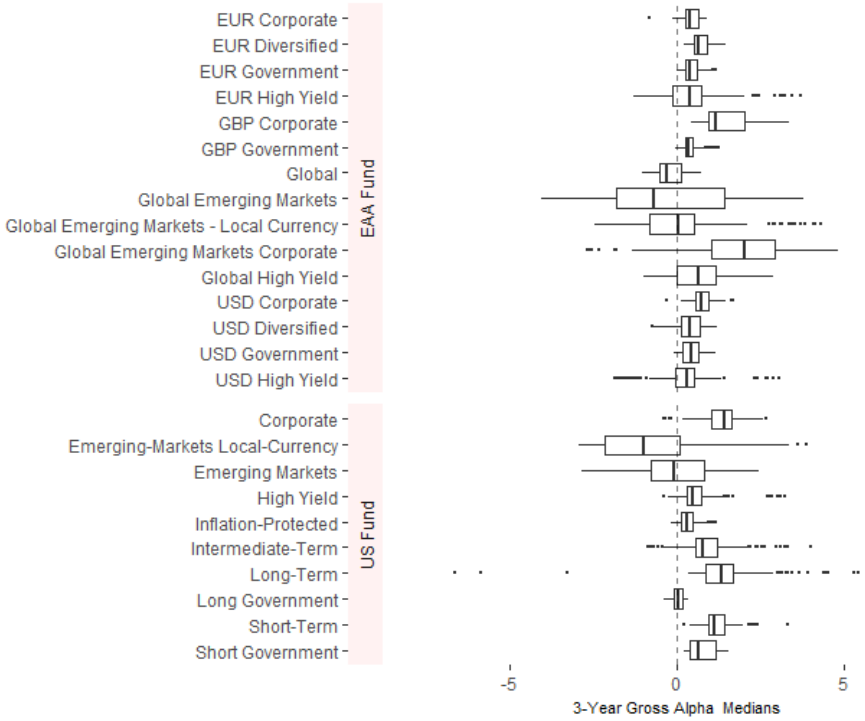
Source: Morningstar Direct. Data as of 31 Oct 2017.

It is apparent that in some categories the median is consistently close to zero and moves only in a tight range. These categories are typically driven by the gravitational pull of the index representing their target universe. In EAA categories such as EUR corporate bond, EUR diversified bond, EUR government bond, GBP government bond, USD diversified bond, and USD government bond, as well as US categories such as inflation-protected bond and short government, investors can thus forecast gross excess returns of the *typical* fund with a fairly high confidence. In contrast, in categories such as EAA fund global emerging

markets corporate bond, the median has moved in an exponentially wider range around the benchmark index, which does not allow any meaningful forecast of typical excess returns to be made.

In 13 of our 25 categories, median gross excess returns have been positive more often than not in the three-year periods analyzed. The highest median is within US fund corporate bond, where the median manager has delivered a 0.76% annualized gross excess return over three-year periods.

Exhibit 5 Gross Alpha Medians in Rolling 3-Year Periods 2002–17 Against Morningstar Category Benchmarks



Source: Morningstar Direct. Data as of 31 Oct 2017.

EAA fund global emerging markets corporate bond tied for first place at 0.76% annualized excess return, but with a much wider range of outcomes for the average fund in this small category. If an investor selected a fund at random in these two categories, the baseline expectation (median) would be the same, but the probability of hitting anywhere near that point estimate would be vastly different in the two categories.

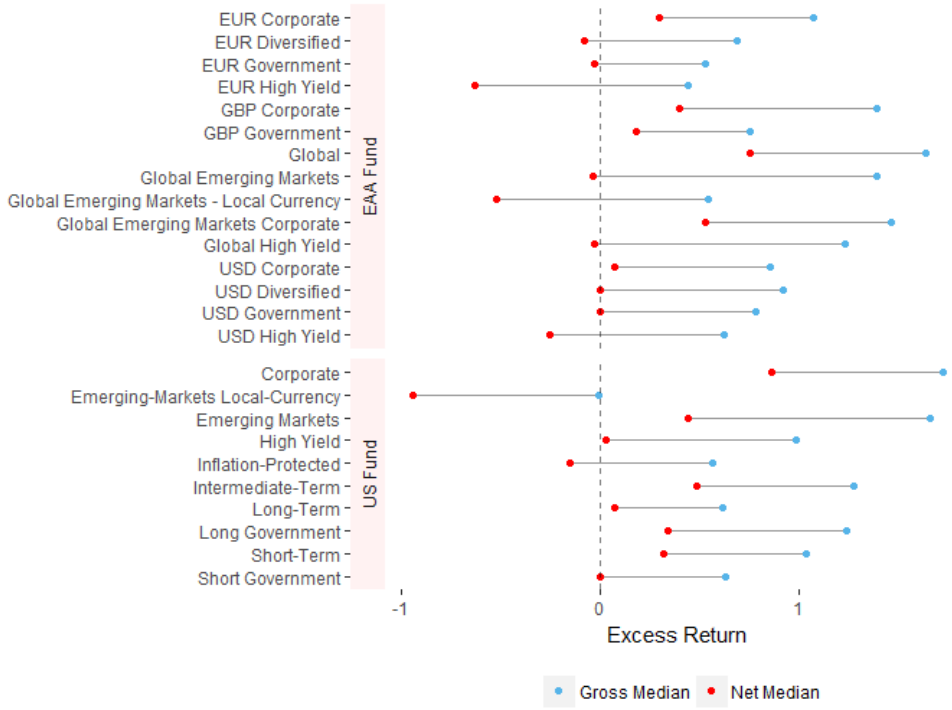
Exhibit 5 displays gross median alphas, which control for the amount of market risk taken by funds (beta). We observe a similar pattern as for excess return, with some categories having a very narrow range of alphas and others having much broader ranges. This is logical, as alpha offers merely a different viewpoint into the value added from portfolio management. The main difference is, however, that in some categories, alpha is higher than excess return. This results from the fact that funds tend to have beta coefficients below 1.0 compared with their category index.

Until now we have looked only at *gross* returns and discussed category medians within rolling three-year periods. They show that the median fund has produced a negative gross excess return of 7 basis points and a gross annualized alpha of 47 basis points over the period included in our study. Although there are

exceptions–which we'll discuss later–these headline results suggest that we should not expect to beat benchmarks or even passive vehicles on an after-fee basis just by betting on the median fund. It is therefore instructive to see how much better odds are available to investors who are successfully able to select the better performers in a category.

We show in Exhibit 6 how funds at the cutoff of the top quintile of their categories (20th percentile) have performed, against their category's index in 3-year rolling periods, on a gross and net of fees basis. (Light blue dots represent the median of gross of fees excess returns, and red dots the after-fee medians for funds in the best quintile.)

Exhibit 6 Gross Excess Returns for Funds at 20th Percentile of Distribution, Rolling 3-Year Periods 2002–17 Against Morningstar Category Indexes



Source: Morningstar Direct. Data as of 31 Oct 2017.

The chart shows the kind of excess returns investors could have achieved if they had the foresight to select funds that landed at the borderline of the best quintile of their categories in each rolling 3-year period. In most categories, funds in the highest quintile have been able to outperform the category index over time. The most lucrative areas for fund-pickers are categories where the best funds tend to beat the benchmark by a large margin and with a high hit rate. Examples include EAA Fund EUR Corporate Bond, US Fund Corporate Bond, and US Fund Intermediate-term Bond.

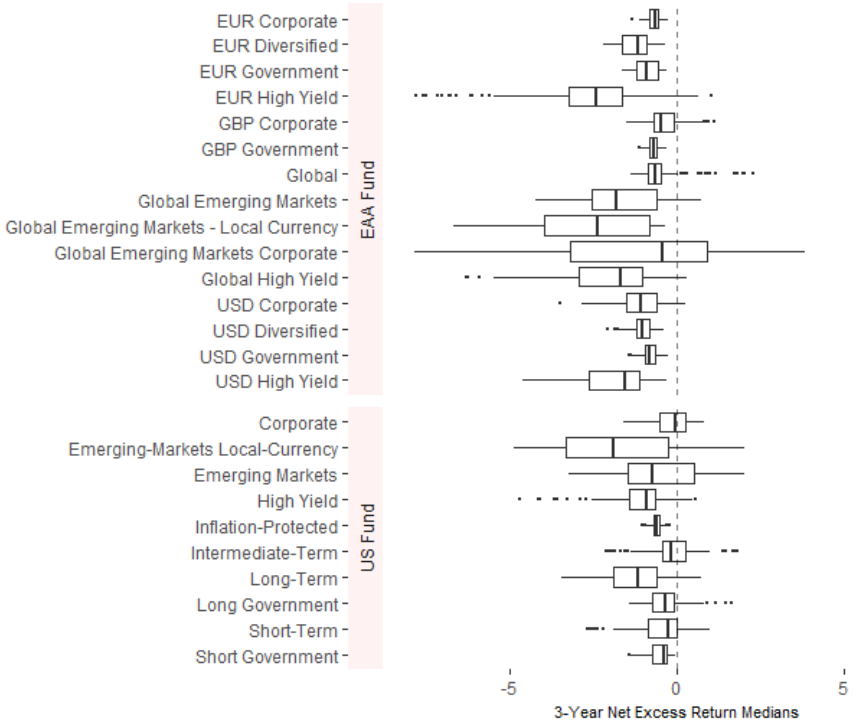
At the other end of the spectrum are categories such as EAA Fund EUR High Yield Bond, where funds in the highest quintile have seen their fortunes swing in a wide range, and on average are only narrowly positive in gross terms.

Exhibits 4 and 5 give the headline results for gross returns for funds that represent the median in their categories. Using these results, investors can form baseline expectations of before-fee returns and then consider what level of fees might be rational to pay without eroding the odds of outperforming an index or a passive option too much. Fees may differ widely depending on the share class an investor has access to. To give readers a sense of the effect fees may have, we have calculated two comparisons using net returns. We screened out institutional share classes and used the oldest of the remaining (in case of a tie between two noninstitutional share classes with the same history, we chose largest by assets). We compared net returns of these selected share classes with 1) category indexes and 2) the ETFs that best match those indexes.

Exhibit 7 displays how funds' net excess return medians have moved against the category indexes through time with the ticked vertical line at zero.

Net excess returns for the median period are negative for all 25 categories analyzed in the rolling three-year periods. This is not entirely surprising, but it powerfully demonstrates the extent to which fees weigh on funds' success. Even in categories where funds may be able to add value on a gross basis, the median fund failed to beat the benchmark after fees. (See Appendix for excess net return statistics in detail.)

Exhibit 7 Net Excess Returns of Category Medians, Rolling 3-Year Periods 2002–17 Against Morningstar Category Benchmarks



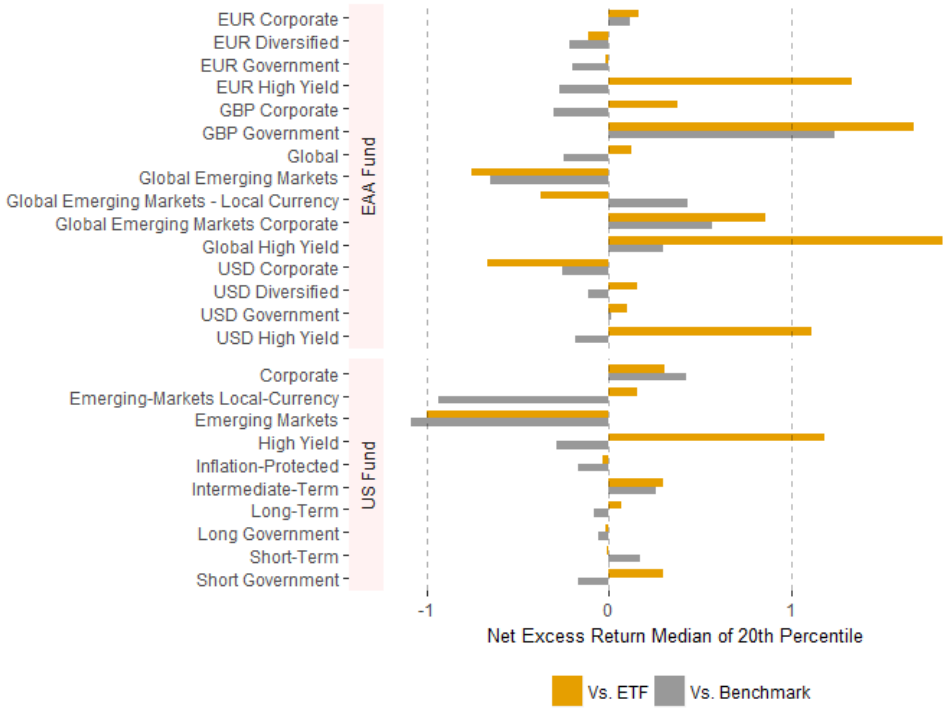
Source: Morningstar Direct. Data as of 31 Oct 2017.

If the median fund does not cut it, how about funds that do better than the average? In Exhibit 6, we observed that, in many categories, gross excess returns for top quintile funds were high enough to allow positive excess returns after fees. Exhibit 8 shows comparisons of top-quintile funds on a net basis

against the category index and the most relevant or longest-running comparable ETF. This exhibit covers the rolling three-year periods since December 2012, the earliest common date of the ETFs we have looked at.

There are only eight categories in which funds at the 20th percentile outperformed the benchmark index in the average three-year period, and only one, GBP government bond, where the outperformance was greater than 1 percentage point annualized. In the categories where we observe a narrow range of outcomes, the median net excess return of the best quintile comes very close to zero. In other words, funds that land in the top quintile of their peer group were just able to match the performance of the category index.

Exhibit 8 Net Excess Returns Compared With Benchmarks and ETFs for Highest Quintile of Funds, Rolling 3-Year Returns December 2012–October 2017



Source: Morningstar Direct. Data as of 31 Oct 2017.

Returns against passive offerings are, however, more encouraging: In 16 of the above categories, active funds in the top quintile have outperformed the most relevant ETF on a net-of-fee-return basis. For example, in EAA fund EUR high yield, while even the best active managers in this category have lagged the category index, investors would not have been better off buying an ETF. The stringent liquidity criteria applied by passive funds, as well as the inherent transaction costs of this less-liquid market, have typically led the ETFs to miss out on an even greater proportion of the index's returns. Thus, despite underperforming the benchmark index, funds in the top quintile of the EUR high yield bond peer group have outperformed a representative ETF, iShares EUR High Yield Corp Bond ETF, by more than 1% in the average three-year rolling period from December 2012 to October 2017. Active funds in the USD high yield category have done equally well against a representative ETF. High-yield ETFs typically filter out the smaller bonds in the universe for liquidity reasons, and there are numerous opportunities for active managers to add value by investing in smaller, less-liquid bonds that offer higher compensation for that

illiquidity. Strong fundamental research can also pay off if active managers are able to exploit informational inefficiencies in this market.

As noted earlier, there are two cases in which the ETF we chose to conduct our analysis does not perfectly match the category index, for lack of a more representative ETF with sufficient performance history. The EAA global bond category, which is benchmarked against the Bloomberg Barclays Global Aggregate Bond Index and includes some corporate bond exposure, was compared here against the government-bond-only iShares Global Government Bond USD ETF. (the other peer group is US fund short government bond, where a one- to three-year maturity ETF was used, whereas the category index spans one to five years). Thus, while the median fund in the global bond peer group has only slightly edged the global aggregate index, it had an easier time beating the government-bond-only iShares Global Government Bond USD ETF. As other passive options become available over time (the State Street Global Aggregate Bond Index fund was launched in 2014, for example), we will be able to draw more-meaningful conclusions on the relative merits of active and passive funds within global aggregate bonds.

Results by Category Group

The 25 categories we have looked at can be broadly ranked into three groups based on the dispersion of medians, maximum and minimum values, and interquartile ranges for category median excess returns.

In categories where the "gravity" of the benchmark is strong (as with funds investing mainly in developed-markets government bonds or investment-grade corporate bonds), we find that the median gross returns of any three-year period are close to zero and do not move much during the 154 rolling periods we looked at.

At the other extreme are categories where risks are higher, and dislocations in the market have moved the whole distribution of funds up or down in terms of excess returns. These categories are mostly within the emerging-markets and high-yield areas.

Some categories fall in a middle ground between the two. In these categories (Group 2), the median of the distribution has moved around through time but not as significantly as in the second group. We also see more heterogeneity within these groups than in the more-stable government and corporate bond categories.

Group 1: Benchmark-Driven Categories

EAA Fund EUR Corporate Bond
EAA Fund EUR Diversified Bond
EAA Fund EUR Government Bond
EAA Fund USD Diversified Bond
EAA Fund USD Government Bond
EAA Fund GBP Government Bond
US Fund Inflation-Protected Bond
US Fund Short Government
US Fund Long Government

Excess three-year rolling returns move the least within these nine categories through time. This means that investors should have an easier time setting expectations for fund excess returns and alphas.

Betas represent the amount of market risk the median fund in the category has taken. In several of these categories, beta has been reasonably close to 1.0 on average. The lowest betas can be found within the EAA fund diversified bond and US fund short government categories, where managers have tended to deviate from the duration of the benchmark. The R-squared displays the strength of the linear regression between the returns and the corresponding benchmark. The EUR and USD diversified bond categories clock in at lower levels than others: Funds in these categories have leeway to invest in a somewhat broader set of fixed-income instruments, and the dispersions of returns and R-squared are also wider.

Median gross excess returns vary slightly through time, but they trend broadly towards zero across these categories. The higher dispersion of median excess returns within US fund long government can be explained by the fact that several funds in this narrow category have had much longer durations than

the category index, resulting in performance deviations in periods of interest-rate volatility, although this has not had a meaningful impact on long-term returns.

Exhibit 9 Gross Return Statistics of Funds in "Group 1"

Category	Gross Excess Return	St Dev of Gross Excess Return	Gross Alpha, Median	Beta, Median	R-Squared, Median
EAA Fund EUR Corporate Bond	0.12	0.15	0.38	0.95	0.87
EAA Fund EUR Diversified Bond	-0.33	0.45	0.66	0.74	0.72
EAA Fund EUR Government Bond	-0.22	0.31	0.37	0.86	0.85
EAA Fund GBP Government Bond	-0.04	0.19	0.34	0.92	0.89
EAA Fund USD Diversified Bond	-0.10	0.35	0.36	0.92	0.73
EAA Fund USD Government Bond	0.09	0.15	0.42	0.93	0.83
US Fund Inflation-Protected Bond	0.05	0.18	0.30	0.97	0.97
US Fund Long Government	0.17	0.59	0.02	1.02	0.98
US Fund Short Government	0.12	0.31	0.63	0.70	0.82

Source: Morningstar Direct. Data as of 31 Oct 2017.

Within the EAA fund categories EUR diversified bond and government bond, outperformance has become rarer in the period since the euro crisis of 2011. As yields have dropped, governments and companies have lengthened the maturities of their debt, which has increased the duration of most bond indexes. Many fund managers have been reluctant to follow this lead and have suffered some underperformance. This is especially true within EUR diversified bond, which houses funds that allocate assets into both the sovereign and corporate debt markets and use both short and long maturities.

Finally, we calculate the probability of outperformance on a gross-of-fees basis based on the full history. Exhibit 10 displays the share of funds that have at least matched the performance of the benchmark index and outperformed it by 1 and 2 percentage points per year in three-year periods. For each probability we show the median showing as well as periods with minimum and maximum odds. As an example, 54.8% of funds in the EAA fund EUR corporate bond category have been able to beat the category benchmark in the typical (median) period. In the most difficult period for active funds (January 2002–December 2004), 38.1% of funds outperformed, and in the best period (November 2004–October 2007), 75.8% of funds outperformed on a gross basis.

Exhibit 10 Odds of Outperformance Based on 3-Year Rolling Gross Excess Returns (Median Period, Worst Period, Best Period)

Category	By 0 pp, Median	By 0 pp, Min	By 0 pp, Max	By 1 pp, Median	By 1 pp, Min	By 1 pp, Max	By 2 pp, Median	By 2 pp, Min	By 2 pp, Max
EAA Fund EUR Corporate Bond	**54.8**	38.1	75.8	**21.8**	7.4	39.5	**6.0**	0.5	31.6
EAA Fund EUR Diversified Bond	**39.1**	19.1	73.5	**13.7**	4.3	34.2	**3.9**	0.3	15.2
EAA Fund EUR Government Bond	**39.8**	16.5	72.7	**9.7**	1.8	28.4	**1.9**	0.3	11.2
EAA Fund GBP Government Bond	**46.4**	25.9	81.8	**17.9**	0.0	28.6	**7.5**	0.0	23.2
EAA Fund USD Diversified Bond	**47.3**	28.4	70.2	**19.1**	5.8	37.1	**7.8**	1.9	25.0
EAA Fund USD Government Bond	**58.1**	30.4	77.5	**15.8**	2.1	37.5	**4.8**	0.0	25.0
US Fund Inflation-Protected Bond	**55.8**	26.1	83.1	**9.5**	0.0	30.0	**1.8**	0.0	16.0
US Fund Long Government	**61.5**	22.2	92.3	**25.0**	0.0	61.5	**16.7**	0.0	50.0
US Fund Short Government	**57.9**	24.0	93.7	**11.1**	0.0	25.6	**1.6**	0.0	17.8

Source: Morningstar Direct. Data as of 31 Oct 2017.

In the median three-year period (column 2 in Exhibit 10), funds matched or outperformed the index between 39% and 62% of the time, based on the gross-of-fees returns analyzed in this paper. However, only a modest portion of funds have been able to generate a 1-percentage-point margin of outperformance against the index, even before fees are taken into account. Multiple categories have seen three-year periods without any funds being able to perform at this level. And finally, 2-percentage-point outperformance at the gross level has been a rarity in almost all categories in this group.

Group 2: Categories With Moderate Stability

EAA Fund Global Bond
US Fund High Yield Bond
US Fund Intermediate-Term Bond
US Fund Long-Term Bond
US Fund Short-Term Bond
EAA Fund USD Corporate Bond
EAA Fund USD High Yield Bond
EAA Fund GBP Corporate Bond
US Fund Corporate Bond

We find that a subset of the categories in our study have a reasonably close fit with the category index over the long term (as illustrated by the R-squared metric) but still have a high dispersion of excess returns around the median as well as periods in which the median itself has deviated significantly from the index.

For example, the median fund in the USD Intermediate-Term Bond peer group was able to outperform the Bloomberg Barclays US Aggregate Bond Index by 0.49% before fees (median calculated over three-year rolling periods from January 2002 to October 2017), however that figure is only of limited use for investors looking to derive future return expectations at the fund level, given the high standard deviation associated with it (0.68). Gross excess return medians for the other categories in the group range from negative 0.52% to 0.76% but with similarly large dispersions around the median.

Exhibit 11 Gross Return Statistics of Funds in "Group 2"

Category	Gross Excess Return	St Dev of Gross Excess Return	Gross Alpha, Median	Beta, Median	R-squared, Median
EAA Fund GBP Corporate Bond	0.45	0.6	1.16	0.85	0.86
EAA Fund Global Bond	0.19	0.72	-0.31	1.12	0.87
EAA Fund USD Corporate Bond	-0.29	0.59	0.71	0.83	0.79
EAA Fund USD High Yield Bond	-0.32	0.91	0.28	0.92	0.94
US Fund Corporate Bond	0.76	0.47	1.41	0.84	0.90
US Fund High Yield Bond	0.06	0.82	0.46	0.91	0.95
US Fund Intermediate-Term Bond	0.49	0.68	0.79	0.94	0.88
US Fund Long-Term Bond	-0.52	0.82	1.32	0.57	0.85
US Fund Short-Term Bond	0.41	0.69	1.13	0.65	0.63

Source: Morningstar Direct. Data as of 31 Oct 2017.

Another observation is that median funds in the US high-yield and EAA USD high-yield peer groups have struggled to beat their corresponding category index over long periods (0.06% and negative 0.32% median excess return, respectively), even before accounting for fees. (While that seems bleak, those funds have typically done a much better job against a representative ETF, as illustrated earlier in Exhibit 8, and top-quintile funds in the USD high yield category have outperformed the ETF by more than 1% on average.) This highlights that investors are, on average, better off choosing an actively managed US high-yield fund than an index-tracker. Still, the US high yield category exhibits high dispersions around the median, so investors need to exercise caution in choosing individual funds and understanding their potential biases–such as concentrations in sectors and individual names, or an emphasis on the lowest quality credits–which are likely to drive relative performance over the shorter term.

Our data also shows that gross excess returns relative to the category index have varied significantly over shorter periods, particularly in times of market stress such as the 2008 sell-off and the subsequent rebound in 2009, as well as the 2013 taper tantrum, as shown in Exhibit 12. These are explained both by structural biases in some funds and by the way most active managers have used their flexibility to position their portfolios around these market events. One axis of differentiation amongst funds that make up a single peer group is interest-rate sensitivity. For example, the US fund long-term bond category includes funds that follow a wider range of duration than the associated Bloomberg Barclays US Govt/Credit Long TR USD Index and the representative iShares Core 10+ Year USD Bond ETF. In a volatile interest-rate environment, such funds will naturally exhibit wider dispersions in alpha and excess return relative to the index.

The second axis of differentiation is exposure to credit risk. For example, we find that funds in the US fund short-term bond category, which is benchmarked against a 50/50 US government/corporates index, have significant latitude to invest in corporate bonds as well as structured credit, giving them a sizeable yield advantage over the index. Roughly half of the funds in the category focus on the one- to three-year maturity segment, with the rest focusing on the one- to five-year maturity range. Such differences create noise that make the overall distribution of outcomes relative to the Bloomberg Barclays US Govt/Credit 1-5 Yr TR Index difficult to interpret reliably.

Exhibit 12 3-Year Gross Excess Return Medians for "Group 2" Categories by Period Start Date

Source: Morningstar Direct. Data as of 31 Oct 2017.

Similarly, many funds in the US fund intermediate-term bond category have taken on more credit risk than the Bloomberg Barclays US Aggregate Bond Index. This explains why the median fund in the category lagged the benchmark in most periods up until and including 2008 but outperformed it as credit subsequently rallied. Similarly, the USD corporate bond peer group isn't as homogenous a group as it might appear, as it also includes funds that follow the Bloomberg Barclays US Aggregate Bond Index but whose biases to credit (generally two thirds or more of their portfolios) make them ineligible for the diversified bond categories. That explains the poorer fit to the category index (R-squared of 0.79).

As expected, we thus find greater dispersion in excess returns for funds in Group 2 compared with Group 1 (Exhibit 13). In the typical (median) three-year period (column 2), Group 2 funds have been able to outperform, before fees, 37% to 78% of the time depending on the category. Compared with Group 1, however, a larger proportion of funds have been able to outperform the index by 1 percentage point or more (14% to 40% depending on the category), and a non-negligible portion by 2 percentage points or more. This suggests that Group 2 has been a somewhat more lucrative area for active bond managers, at least on a gross-of-fees basis (Appendix 1 includes the same results on a net-of-fees basis).

Exhibit 13 Odds of Outperformance Based on 3-Year Rolling Gross Excess Returns (Median Period, Worst Period, Best Period)

Category	By 0 pp, Median	By 0 pp, Min	By 0 pp, Max	By 1 pp, Median	By 1 pp, Min	By 1 pp, Max	By 2 pp, Median	By 2 pp, Min	By 2 pp, Max
EAA Fund GBP Corporate Bond	**66.3**	25.0	89.2	**31.6**	6.7	71.3	**10.6**	2.0	45.7
EAA Fund Global Bond	**54.7**	31.4	92.5	**32.1**	5.2	84.1	**15.2**	0.8	74.2
EAA Fund USD Corporate Bond	**41.0**	16.7	83.3	**18.8**	5.1	51.7	**9.7**	0.0	34.5
EAA Fund USD High Yield Bond	**38.5**	5.7	78.0	**14.3**	2.9	38.0	**5.9**	0.0	23.3
US Fund Corporate Bond	**69.2**	33.3	96.9	**40.5**	12.5	67.9	**15.4**	2.1	37.5
US Fund Intermediate-Term Bond	**77.6**	25.4	86.5	**26.5**	4.6	72.9	**8.9**	0.3	58.4
US Fund Long-Term Bond	**37.5**	5.3	88.9	**15.8**	0.0	50.0	**5.9**	0.0	33.3
US Fund Short-Term Bond	**75.7**	14.9	96.4	**21.2**	1.4	61.4	**6.2**	0.0	47.7

Source: Morningstar Direct. Data as of 31 Oct 2017.

Group 3: Categories With Unstable Medians

EAA Fund EUR High Yield Bond
EAA Fund Global Emerging Markets Bond
EAA Fund Global Emerging Markets Bond - Local-Currency
EAA Fund Global Emerging-Markets Corporate Bond
EAA Fund Global High Yield Bond
US Fund Emerging-Markets Local-Currency Bond
US Fund Emerging Markets Bond

Finally, we've identified a group of categories in which the median fund's returns have deviated dramatically from the benchmark index over time, sometimes by more than 5 percentage points (EAA fund global emerging markets bond local currency category in the period from 2005 to 2008). Mostly, these deviations have been on the downside, driving down the median gross excess return into negative territory for five of these seven categories.

Exhibit 14 Gross Return Statistics of Funds in "Group 3"

Category	Gross Excess Return	St Dev of Gross Excess Return	Gross Alpha, Median	Beta, Median	R-squared, Median
EAA Fund EUR High Yield Bond	-1.19	1.87	0.36	0.83	0.88
EAA Fund Global Emerging Markets Bond	-0.47	1.3	-0.7	1.06	0.84
EAA Fund Global Emerging Markets Bond - Local Currency	-1.4	2.13	0.02	0.98	0.95
EAA Fund Global Emerging Markets Corporate Bond	0.76	2.86	2.01	0.75	0.88
EAA Fund Global High Yield Bond	-0.24	1.28	0.63	0.89	0.89
US Fund Emerging-Markets Local-Currency Bond	-0.8	1.94	-1.01	1.15	0.95
US Fund Emerging Markets Bond	0.43	1.35	-0.08	1.07	0.92

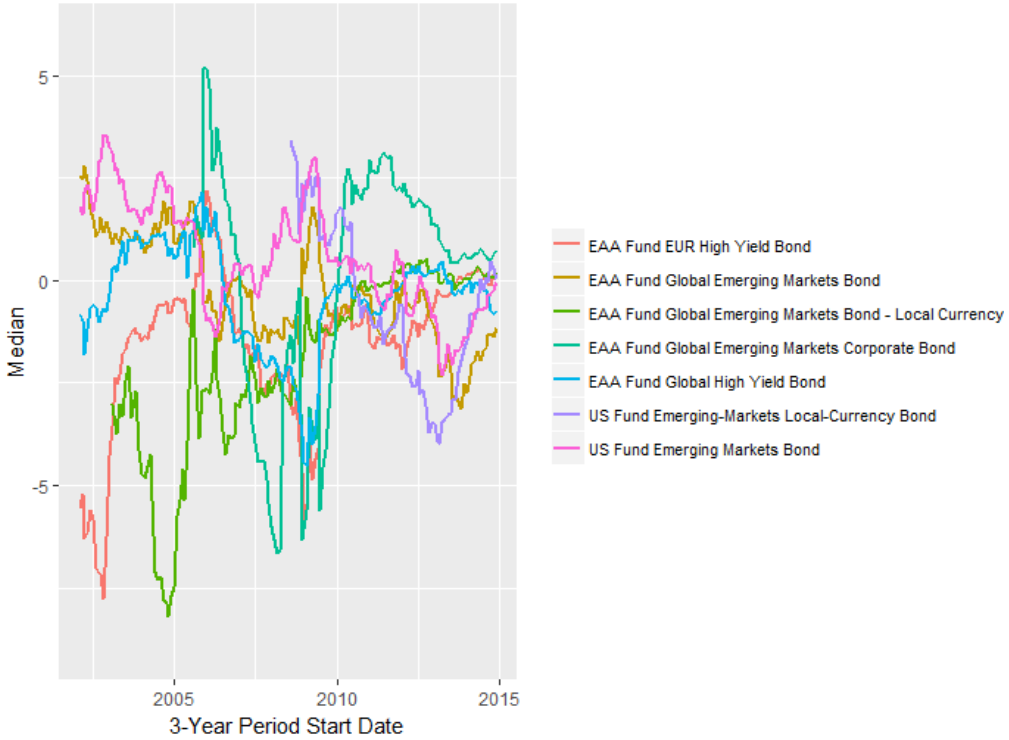
Source: Morningstar Direct. Data as of 31 Oct 2017.

For example, the median fund in the EUR high yield bond category has widely underperformed the Bloomberg Barclays Pan Euro HY Euro TR EUR Index in the rolling three-year periods from 2002 to 2005.

That period coincided with a very strong bull market for European high yield, driven largely by CCC rated bonds (the ICE BofAML CCC & Lower European Ccy HY Index delivered more than 13% annualized, in EUR terms, between January 2002 and December 2005). Thus, most active managers that were either constrained by their mandates to invest only in BB and B rated bonds, or simply unwilling to take on greater default risk by investing in lower-quality bonds, naturally lagged the broader index. While active high-yield managers did a better job, on average, at protecting investors' capital in the 2008 sell-off, they lagged the index by a much wider magnitude in 2009's junk rally.

The long-term picture for active European high-yield managers against the index is thus underwhelming. However, that's not to say that investors would have been better off buying an ETF. The stringent liquidity criteria applied by passive funds, as well as the inherent transaction costs of this less-liquid market, have typically led the ETFs to miss out on an even greater proportion of the index's returns. As illustrated earlier in Exhibit 8, funds in the top quartile of the EUR high yield bond peer group have outperformed the iShares EUR High Yield Corp Bond ETF by more than 1% in the average three-year rolling period covered by our study.

Exhibit 15 3-Year Gross Excess Return Medians for "Group 3" Categories by Period Start Date



Source: Morningstar Direct. Data as of 31 Oct 2017.

Funds in the global emerging markets bond–local currency and global emerging markets corporate bond categories also lagged their respective indexes by a wide margin in the bull market of the mid-2000s and again in 2009, although these figures should be taken with a grain of salt given the small sample size of funds in existence at the time. Overall, funds' chances of gross outperformance against their indexes ranged between 20% and 69% in these categories in the median three-year rolling period from 2002 to 2017. But results are very polarized in the worst and best period. In some periods, zero funds in the peer group were able to match the index. For example, in the rolling three-year periods from January 2002 to

November 2005, a period of exponential growth in the EUR high-yield market, no fund in the category has been able to keep up with the index. In other cases, 100% of the peer group landed ahead of the index. That is the case for the EAA global emerging markets corporate bond category in the rolling three-year periods from August 2005 to July 2009, which includes the severe market correction of 2008 when active managers were better able to protect investors' capital. More generally, investors in these categories thus need to exercise extra caution when choosing an active manager and to be cognizant of the structural differences between their portfolio and the benchmark index in order to form expectations of relative performance.

Exhibit 16 Percentage of Funds Outperforming Based on 3-Year Rolling Gross Excess Returns (Median Period, Worst Period, Best Period)

Category	By 0 pp, Median	By 0 pp, Min	By 0 pp, Max	By 1 pp, Median	By 1 pp, Min	By 1 pp, Max	By 2 pp, Median	By 2 pp, Min	By 2 pp, Max
EAA Fund EUR High Yield Bond	**27.7**	0.0	71.3	**13.7**	0.0	60.9	**6.4**	0.0	54.0
EAA Fund Global Emerging Markets Bond	**41.7**	18.8	85.9	**25.2**	5.0	73.3	**12.8**	0.0	63.5
EAA Fund Global Emerging Markets Bond - Local Currency	**25.0**	0.0	71.3	**14.6**	0.0	36.5	**5.0**	0.0	25.0
EAA Fund Global Emerging Markets Corporate Bond	**69.0**	0.0	100.0	**39.7**	0.0	100.0	**7.8**	0.0	100.0
EAA Fund Global High Yield Bond	**44.4**	0.0	100.0	**24.1**	0.0	70.6	**5.5**	0.0	52.9
US Fund Emerging-Markets Local-Currency Bond	**20.0**	0.0	100.0	**10.5**	0.0	100.0	**5.6**	0.0	80.0
US Fund Emerging Markets Bond	**64.0**	11.7	91.7	**33.3**	5.0	87.0	**14.3**	0.0	73.9

Source: Morningstar Direct. Data as of 31 Oct 2017.

Odds of Outperformance Drop Significantly After Fees

So far, our discussion of different categories has focused on the ability of funds to deliver gross-of-fees outperformance against a relevant market index. While we have uncovered that some categories provide higher chances of outperformance than others, the key question for investors is whether the fees charged by the funds are sufficiently low to preserve this outperformance.

Unfortunately, most bond funds are "priced to fail": their fixed fees are in line with, or sometimes even above, their historical margin of gross-of-fees outperformance, thereby negating or even destroying the value added by managers. Exhibit 17 lists the percentage of funds in each category that outperformed their respective category index after fees in the median three-year rolling period from 2002 to 2017. Again, to calculate these figures, we used the oldest available retail share class for each fund, thus excluding share classes that are only available to institutional investors or not widely available.

The percentage of funds that managed to perform at least as well as the index ranged from a meagre 10.5% to 49% depending on the category. The percentage of funds beating the index by more than 1 percentage point was substantially lower, and only a handful managed to beat the index by more than 2% on a net-of-fees basis.

Exhibit 17 Percentage of Funds Outperforming Based on 3-Year Rolling Net Excess Returns (Median Period, Worst Period, Best Period)

Category	By 0 pp, Median	By 0 pp, Min	By 0 pp, Max	By 1 pp, Median	By 1 pp, Min	By 1 pp, Max	By 2 pp, Median	By 2 pp, Min	By 2 pp, Max
EAA Fund EUR Corporate Bond	**29.4**	12.4	42.7	**7.4**	0	32.1	**2.2**	0	25.7
EAA Fund EUR Diversified Bond	**18.3**	4.3	40.1	**4.6**	0.8	17.7	**1.4**	0	9.9
EAA Fund EUR Government Bond	**19.0**	4.2	37.4	**3.3**	0	14.2	**1.0**	0	6.3
EAA Fund EUR High Yield Bond	**12.2**	0	58.6	**5.7**	0	50.6	**3.0**	0	40.2
EAA Fund GBP Corporate Bond	**31.8**	11.5	71.3	**11.3**	2.5	52.1	**4.2**	0	37.4
EAA Fund GBP Government Bond	**23.6**	5.8	38.1	**13.6**	0	22.8	**4.5**	0	21.2
EAA Fund Global Bond	**34.3**	10.0	83.3	**16.7**	1.6	71.2	**8.5**	0.4	54.5
EAA Fund Global Emerging Markets Bond	**20.0**	2.0	66.7	**8.0**	0	47.6	**4.6**	0	36.5
EAA Fund Global Emerging Markets Bond - Local Currency	**14.3**	0	37.6	**5.4**	0	25.0	**0**	0	9.1
EAA Fund Global Emerging Markets Corporate Bond	**36.4**	0	100.0	**13.8**	0	100	**1.8**	0	100
EAA Fund Global High Yield Bond	**22.2**	0	58.8	**6.2**	0	35.3	**0**	0	35.3
EAA Fund USD Corporate Bond	**23.8**	7.1	55.2	**12.5**	0	37.9	**5.4**	0	31.0
EAA Fund USD Diversified Bond	**20.3**	7.0	41.6	**7.5**	1.7	23.5	**3.3**	0	17.4
EAA Fund USD Government Bond	**20.5**	6.4	47.5	**7.0**	0	30.0	**3.7**	0	22.5
EAA Fund USD High Yield Bond	**14.7**	2.9	43.3	**5.9**	0	26.7	**3.6**	0	15.6
US Fund Corporate Bond	**48.9**	18.4	71.4	**18.2**	0	44.7	**7.7**	0	34.2
US Fund Emerging-Markets Local-Currency Bond	**10.5**	0	100	**5.0**	0	66.7	**4.8**	0	33.3
US Fund Emerging Markets Bond	**29.2**	2.7	86.4	**11.8**	0	69.6	**4.3**	0	50.0
US Fund High Yield Bond	**21.2**	1.8	61.0	**7.4**	0.5	42.6	**2.7**	0	22.6
US Fund Inflation-Protected Bond	**14.5**	0	34.6	**3.2**	0	18.4	**0**	0	14.0
US Fund Intermediate-Term Bond	**39.2**	10.5	76.8	**11.2**	0.5	62.6	**4.8**	0	46.9

Source: Morningstar Direct. Data as of 31 Oct 2017.

Success Ratios Affected by High Fund Mortality

We wrap up this study by looking at success ratios, which measure the percentage of funds' that both survived and outperformed the category benchmark over a given period. So far, our analysis of gross-of-fees and net-of-fees returns has been based on rolling returns of three-year periods, where only funds that managed to survive a rolling period were included in that period's returns. However, some funds were merged or liquidated during each three-year period. If we include those funds in the analysis, we find that both surviving the period under analysis and managing to outperform the category index was a daunting task. On an after-fee basis, success ratios range from 0% (US fund long government) to 39% (US fund intermediate term bond) in the most recent three-year period ended 31 Oct 2017. The median success ratio over all three-year rolling periods was lowest in EAA fund EUR high yield bond (9%) and highest in US fund corporate bond (49%).

We highlight that success ratios have typically been lower in Europe compared with the US. For example, the median-period success ratio in the EAA global emerging markets bond peer group of 15% was lower than the corresponding US emerging markets bond peer group (29%). That's explained both by the high fees charged to European investors compared with similar products sold in the US and by the higher mortality rate of funds in Europe. On the fee front, it's encouraging that costs have trended downwards over the past few years,[5] and that several European markets have banned rebates, which should further reduce costs and improve investors' experience going forward. Exhibit 18 lists success ratios for all periods (median), as well as the past three and five years through 31 Oct 2017.

5 Morningstar European Cost Study 2016.
https://media.morningstar.com/uk%5CMEDIA%5CResearch_Paper%5C2016_Morningstar_European_Cost_Study_17082016.pdf

Exhibit 18 Success Ratios Across All Rolling 3-Year Periods and in Trailing 3 and 5 Years in Percent

Category	Success Median %	Success Trailing 3 Years %	Success Trailing 5 Years %
US Fund Corporate Bond	49	37	55
US Fund Intermediate-Term Bond	35	39	42
EAA Fund Global Emerging Markets Corporate Bond	33	34	45
EAA Fund Global Bond	32	11	19
US Fund Short-Term Bond	32	39	34
EAA Fund GBP Corporate Bond	30	11	16
US Fund Emerging Markets Bond	29	15	24
EAA Fund EUR Corporate Bond	26	28	25
US Fund Long Government	25	0	0
EAA Fund USD Corporate Bond	21	8	16
EAA Fund GBP Government Bond	20	20	15
US Fund Long-Term Bond	18	11	17
US Fund High Yield Bond	18	9	9
US Fund Short Government	18	8	3
EAA Fund Global High Yield Bond	18	8	12
EAA Fund USD Diversified Bond	17	18	17
EAA Fund USD Government Bond	17	18	17
EAA Fund Global Emerging Markets Bond	16	12	13
EAA Fund EUR Government Bond	15	14	12
EAA Fund EUR Diversified Bond	14	14	12
EAA Fund Global Emerging Markets Bond - Local Currency	14	21	14
US Fund Inflation-Protected Bond	14	17	25
EAA Fund USD High Yield Bond	12	11	10
US Fund Emerging-Markets Local-Currency Bond	11	24	6
EAA Fund EUR High Yield Bond	9	17	10

Source: Morningstar Direct. Data as of 31 Oct 2017.

On the other hand, many fund companies in Europe have engaged in lineup churn over the years, and recent consolidation in the asset management industry has also resulted in a wave of fund mergers and liquidations. Simply looking at survival rates across categories provides a striking picture: For example, in the EAA global emerging markets bond–local currency category, the survivorship rate has been 86% in a typical three-year period, but only 63% of funds have survived the most recent five-year period. Other categories, such as EAA GBP government bond, EAA USD government bond, and US long-term bond, also have low five-year survivorship rates.

Exhibit 19 shows the typical survival rate in three-year periods as well as for the past three and five years.

Exhibit 19 Survival Rates Across All Periods, 3 and 5 Years in Percent

Category	Survival, Median	Survival Trailing 3 Years	Survival Trailing 5 Years
EAA Fund Global Emerging Markets Corporate Bond	100	78	78
US Fund Emerging-Markets Local-Currency Bond	100	90	89
US Fund Corporate Bond	100	96	94
EAA Fund Global High Yield Bond	96	81	71
EAA Fund Global Bond	96	85	75
US Fund Inflation-Protected Bond	95	91	90
US Fund Long Government	92	83	83
EAA Fund EUR High Yield Bond	91	86	83
EAA Fund USD High Yield Bond	89	85	90
EAA Fund GBP Corporate Bond	88	84	77
EAA Fund EUR Corporate Bond	88	86	76
US Fund Emerging Markets Bond	87	82	80
US Fund High Yield Bond	87	86	80
US Fund Short-Term Bond	87	89	83
EAA Fund USD Corporate Bond	87	95	84
EAA Fund Global Emerging Markets Bond - Local Currency	86	74	63
EAA Fund Global Emerging Markets Bond	86	79	77
EAA Fund GBP Government Bond	85	75	61
US Fund Intermediate-Term Bond	84	91	83
EAA Fund USD Diversified Bond	83	84	75
US Fund Short Government	82	78	74
EAA Fund EUR Government Bond	82	83	71
EAA Fund EUR Diversified Bond	80	82	70
EAA Fund USD Government Bond	79	75	58
US Fund Long-Term Bond	62	63	39

Source: Morningstar Direct. Data as of 31 Oct 2017.

Conclusion

Historical returns data provides useful insights on the ability of active fixed-income funds to add value against their benchmarks on a gross-of-fees basis. With the help of these estimates, investors are in a better position to decide how much they are willing to pay for funds in a specific category without impairing their chances to beat the benchmark. We can summarize our key findings as follows:

In benchmark-driven categories, costs have on balance a greater impact on net return than does manager skill, making the case for low-cost investments (be they active or passive).

In four of the categories included in our study (EAA fund EUR diversified bond, EUR government bond, GBP government bond and USD diversified bond), the typical active fund has consistently underperformed the category index even before accounting for fees. There is also little dispersion between the best and the worst active funds. This makes a strong case for low-cost investments: it makes sense for investors in these categories to focus primarily on passive funds and the small number of active funds that charge fees as low, or lower, than those of comparative passive funds.

In five of the other categories (EAA EUR corporate bond, USD government bond, US fund inflation-protected bond, US fund long government, and US fund short government), the typical active fund has managed to outperform the category index on a gross-of-fees basis, but only by a very narrow margin (margins of outperformance range from 5 to 17 basis points in the median period covered by our study). Median fees in these five categories range from 42 to 85 basis points per year,[6] implying that most funds are structurally "priced to fail" relative to the benchmark index. Thus, as before, these categories make a strong case for low-cost passive options, though they might provide slightly greater opportunities than the previous group for cheap active funds.

In more-diverse peer groups, a low-cost passive option is often superior to the typical active fund, but there is still room for manager skill to add value, provided that fees are reasonable.

For our second group of categories, such as EAA fund USD corporate bond and GBP corporate bond, results appear identical on the surface: the typical active fund underperforms the index or outperforms it only very narrowly, even before fees. Thus, a low-cost passive fund seems like a reasonable option for investors looking to invest in these universes. However, as there is more dispersion between the best and the worst active funds, returns available to funds in the top quintile of their peer group are much more encouraging. For example, a fund sitting in the 20th percentile of the GBP corporate bond category has outperformed its category index by more than 1.5% before fees in the typical period covered by our study. Thus, these categories provide–at least based on historical evidence–a more lucrative field for active managers. However, one factor to consider is the persistence of outperformance: Even some of the best active funds in a given three-year period can drop out of their category's top quartile in the following three-year period, and fund mortality also reduces the odds of finding a consistent outperformer. Thus, while there is some evidence that manager skill adds value in these categories, selecting active funds that are likely to outperform their indexes consistently remains a daunting task.

6 Data from Morningstar Direct as of March 2018.

Finally, in universes where volatility and transaction costs are high, both active and passive funds struggle to achieve the performance of the benchmark index over the long term. Within global high-yield bonds, active funds have significant room to add value against a passive alternative, even after accounting for their higher fees. On the other hand, within emerging-markets debt, the median active fund–while competitive on a gross-of-fees basis–has simply been unable to match the performance of a comparable ETF after fees.

In several of our high-yield and emerging-markets debt categories, passive funds fall short of the performance of market indexes, but so do most active managers. In areas where the benchmark index has little value as a guideline, investors should ultimately pit active and passive funds against each other to determine their relative merits. Within the global high-yield universe (EAA EUR high yield bond, EAA global high yield bond, US fund high yield bond) we find that active managers have outperformed their passive counterparts in the median rolling three-year period after fees, suggesting that investors are typically better off choosing an active fund, even if it's just an average one. Furthermore, the outperformance achieved by active fund funds that landed in their category's top quartile has been very large (more than 1 percentage point per year, net of fees) against a comparable ETF, illustrating the high returns achievable by correctly identifying manager skill.

On the other hand, within the emerging-markets bond universe, the picture is bleaker. We find that most active funds end up squandering their theoretical gross-of-fees advantage over ETFs by charging excessive costs. The median active managers in the EAA global emerging markets bond, EAA global emerging markets bond local currency, US fund emerging markets bond, and US fund emerging markets local currency bond categories have lagged their passive counterparts by a significant margin, net of fees, over the three-year rolling periods included in our study. More strikingly, even funds in the top quartile of these categories have underperformed their comparable ETF after accounting for fees, suggesting that passive funds remain a compelling option here.

The conclusions above bear a significant caveat, though. In volatile universes that are prone to market dislocations, the "median" active fund and the "median three-year period" are not necessarily a good reflection of investors' actual experience. Dispersion between the best and worst active funds is very large, and some funds exhibit active bets and biases (such as over- or underexposure to sectors or countries) that will cause their performance to deviate massively from that of the average fund. Similarly, in some market conditions, active managers may do better as a group, only to fall behind the ETF in the following period. While such short-term movements are hard to predict, and manager skill can be difficult to identify, ultimately fees remain a key factor of differentiation between active funds and a key predictor of future long-term performance. Thus, as a general rule, even in categories that appear to be more lucrative for active managers, investors should not turn a blind eye to costs.

Appendix

Exhibit 20 Gross Return Medians of Rolling 3-Year Periods Compared With Category Benchmark, Range and Interquartile Range (Annualized)

Category	Gross Returns, Median	IQR of Medians	Range of Medians	Latest 3-Year Period
EAA Fund EUR Corporate Bond	0.12	0.17	0.86	0.30
EAA Fund EUR Diversified Bond	-0.33	0.70	1.98	-0.13
EAA Fund EUR Government Bond	-0.22	0.53	1.19	-0.30
EAA Fund EUR High Yield Bond	-1.19	1.68	9.93	0.08
EAA Fund GBP Corporate Bond	0.45	0.68	2.45	-0.27
EAA Fund GBP Government Bond	-0.04	0.27	1.01	-0.09
EAA Fund Global Bond	0.19	0.47	3.93	-0.18
EAA Fund Global Emerging Markets Bond	-0.47	2.18	5.92	-1.15
EAA Fund Global Emerging Markets Bond - Local Currency	-1.40	2.88	8.75	0.22
EAA Fund Global Emerging Markets Corporate Bond	0.76	4.01	11.84	0.76
EAA Fund Global High Yield Bond	-0.24	1.25	6.69	-0.74
EAA Fund USD Corporate Bond	-0.29	0.84	3.53	-0.25
EAA Fund USD Diversified Bond	-0.10	0.35	1.86	0.17
EAA Fund USD Government Bond	0.09	0.16	1.03	0.07
EAA Fund USD High Yield Bond	-0.32	1.57	3.70	-0.49
US Fund Corporate Bond	0.76	0.73	2.31	0.43
US Fund Emerging-Markets Local-Currency Bond	-0.80	3.29	7.38	0.03
US Fund Emerging Markets Bond	0.43	2.08	5.85	-0.04
US Fund High Yield Bond	0.06	0.77	5.09	-0.24
US Fund Inflation-Protected Bond	0.05	0.13	0.95	0.10
US Fund Intermediate-Term Bond	0.49	0.73	3.88	0.57
US Fund Long-Term Bond	-0.52	1.21	3.56	0.04
US Fund Long Government	0.17	0.43	3.52	-0.04
US Fund Short-Term Bond	0.41	0.79	3.63	0.48
US Fund Short Government	0.12	0.29	1.28	0.03
Median	0.05	0.73	3.56	0.03
Average	-0.07	1.13	4.08	-0.03

Source: Morningstar Direct. Data as of 31 Oct 2017.

Exhibit 21 Net Return Medians of Rolling 3-Year Periods Compared With Category Benchmark, Range and Interquartile Range (Annualized)

Category	Net Returns, Median	IQR of Medians	Range of Medians	Latest 3-Year Period
EAA Fund EUR Corporate Bond	-0.66	0.26	1.05	-0.43
EAA Fund EUR Diversified Bond	-1.16	0.73	1.88	-0.90
EAA Fund EUR Government Bond	-0.91	0.61	1.35	-0.86
EAA Fund EUR High Yield Bond	-2.44	1.64	10.15	-1.07
EAA Fund GBP Corporate Bond	-0.49	0.60	2.61	-0.94
EAA Fund GBP Government Bond	-0.71	0.21	0.84	-0.62
EAA Fund Global Bond	-0.67	0.39	3.66	-1.05
EAA Fund Global Emerging Markets Bond	-1.83	1.96	4.99	-2.63
EAA Fund Global Emerging Markets Bond - Local Currency	-2.98	3.33	8.81	-0.56
EAA Fund Global Emerging Markets Corporate Bond	-0.44	4.12	11.82	-0.39
EAA Fund Global High Yield Bond	-1.69	1.92	6.61	-1.98
EAA Fund USD Corporate Bond	-1.11	0.93	3.76	-1.07
EAA Fund USD Diversified Bond	-1.03	0.37	1.68	-0.76
EAA Fund USD Government Bond	-0.82	0.28	1.15	-0.66
EAA Fund USD High Yield Bond	-1.55	1.49	4.33	-1.50
US Fund Corporate Bond	-0.04	0.76	2.43	-0.23
US Fund Emerging-Markets Local-Currency Bond	-1.91	3.03	6.89	-1.01
US Fund Emerging Markets Bond	-0.74	1.97	5.28	-1.05
US Fund High Yield Bond	-0.90	0.79	5.28	-1.17
US Fund Inflation-Protected Bond	-0.63	0.16	0.81	-0.48
US Fund Intermediate-Term Bond	-0.19	0.68	3.92	-0.12
US Fund Long-Term Bond	-1.19	1.29	4.21	-0.63
US Fund Long Government	-0.35	0.62	3.09	-0.61
US Fund Short-Term Bond	-0.27	0.85	3.66	-0.19
US Fund Short Government	-0.40	0.45	1.39	-0.37
Median	**-0.82**	**0.76**	**3.66**	**-0.76**
Average	**-1.00**	**1.18**	**4.07**	**-0.85**

Source: Morningstar Direct. Data as of 31 Oct 2017.

Exhibit 22 Net Excess Returns Versus Comparable ETF. Rolling 3-Year Periods 2002–17 (Annualized)

Morningstar Category	ETF	Net Excess Return
EAA Fund EUR Corporate Bond	iShares Core EUR Corp Bond	-0.51
EAA Fund EUR Diversified Bond	iShares EUR Aggregate Bond EUR Dis	-1.38
EAA Fund EUR Government Bond	db x-trackers II Eurozone Govt Bd (DR)1C	-0.80
EAA Fund EUR High Yield Bond	iShares EUR High Yield Corp Bond EUR Dis	0.22
EAA Fund GBP Corporate Bond	Vanguard UK Inv Grade Bd Idx GBP Acc	-0.06
EAA Fund GBP Government Bond	iShares Core UK Gilts GBP Dist	-0.18
EAA Fund Global Bond	iShares Global Govt Bond USD Dist	0.17
EAA Fund Global Emerging Markets Bond	iShares JP Morgan $ EM Bond USD Dist	-1.80
EAA Fund Global Emerging Markets Bond - Local Currency	SPDR® Barclays Emerging Mkts Lcl Bd ET	-1.76
EAA Fund Global Emerging Markets Corporate Bond	iShares $ EM Corp Bond USD Dist	-0.14
EAA Fund Global High Yield Bond	iShares Global HY Corp Bd USD Dist	0.27
EAA Fund USD Corporate Bond	iShares $ Corp Bond USD Dist	-0.77
EAA Fund USD Diversified Bond	iShares US Aggregate Bond USD Dist	-0.61
EAA Fund USD Government Bond	SPDR® Barclays US Treasury Bond ET	-0.59
EAA Fund USD High Yield Bond	iShares $ High Yld Corp Bd USD Dist JDR	-0.12
US Fund Corporate Bond	iShares iBoxx $ Invst Grade Crp Bond	-0.14
US Fund Emerging Markets Bond	iShares JPMorgan USD Emerg Markets Bond	-0.41
US Fund Emerging-Markets Local-Currency Bond	SPDR® Blmbg Barclays Em Mkts Lcl Bd ET	-1.66
US Fund High Yield Bond	iShares iBoxx $ High Yield Corporate Bd	0.37
US Fund Inflation-Protected Bond	iShares TIPS Bond	-0.47
US Fund Intermediate-Term Bond	iShares Core US Aggregate Bond	-0.03
US Fund Long Government	Vanguard Long-Term Government Bond ETF	-0.34
US Fund Long-Term Bond	iShares Core 10+ Year USD Bond	-0.71
US Fund Short Government	iShares 1-3 Year Treasury Bond	0.07
US Fund Short-Term Bond	iShares Core 1-5 Year USD Bond	-0.47

Source: Morningstar Direct. Data as of 31 Oct 2017.

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