Original Research Article

Passive vs. Active Management: A 15-Year Comparative Analysis of Net Returns

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ABSTRACT

This study compares the long-term net returns of actively and passively managed funds over a 15-year window (2010–2025). Annualized net returns were calculated as the Compound Annual Growth Rate (CAGR) for a convenience sample of 21 funds — 9 passively managed index funds and 12 actively managed funds — presented in Table 1 and Table 2. Returns were computed on a total-return basis assuming full reinvestment of dividends and distributions, before individual tax adjustments and before inflation. Because 8 of the 21 funds launched after 2010, each fund was measured over its own available history within the 2010–2025 window rather than over a uniform 15-year period; observation periods are reported individually in Tables 1 and 2. Passively managed funds returned a mean of 14.80% (SD = 2.59) versus 11.65% (SD = 6.08) for actively managed funds, a difference of 3.15 percentage points. An independent two-sample t-test on fund-level CAGRs did not reach statistical significance, $t(19) = 1.45$, $p = .163$, 95% CI [−1.39, 7.70], Cohen's $d = 0.64$, so the null hypothesis of no difference could not be rejected. The direction of the difference is consistent with the fee-drag hypothesis and with prior large-sample evidence, but the two groups in this sample are not matched on asset class, benchmark, inception date, or risk profile, and no risk-adjusted measures were computed. The results should therefore be read as descriptive of this specific, heterogeneous sample rather than as a general test of management style.

Keywords: Compound Annual Growth Rate (CAGR); Passive Indexing; Active Portfolio Management; Management Fees; Asset Allocation; Independent t-test

INTRODUCTION

The active versus passive management debate is one of the most prominent topics in modern financial literature, capturing the attention of retail investors, institutional asset managers, and academic researchers alike. At its core, this debate centers on a fundamental question: can professional fund managers consistently outperform broad market benchmarks, or do the costs associated with active management drag net returns below those of low-cost passive index funds? Active management relies on the expertise of portfolio managers who buy and sell securities, attempting to timing the market or select undervalued stocks to achieve superior returns. In contrast, passive management seeks to replicate the performance of a specific market index, such as the S&P 500 or the Nasdaq-100, minimizing trading activity and keeping fees low (1).

Empirical literature on this topic reveals a consistent pattern favoring the passive approach over long horizons, particularly once total holding costs and management friction are accounted for (1, 2). Results from the SPIVA scorecards illustrate this gap clearly, reporting that

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roughly 88% of active domestic funds underperform the S&P 500 over a 15-year horizon, while only about 12% achieve any degree of outperformance (3). In a related market evaluation, Morningstar found that fund investors captured approximately 1.2 percentage points less per year than the funds they held, a gap attributed to the friction of frequent trading and poor market timing (4). A Vanguard baseline simulation indicates that over a 30-year horizon, an investor in a 0.1% expense-ratio index fund accumulates substantially more wealth than an investor holding an otherwise identical strategy at a 0.7% expense ratio, even when gross asset performance is identical (5).

The mechanism most often proposed for this gap is the disparity in expense ratios, which creates a hurdle that active funds must clear every year simply to match their benchmarks (11). Actively managed funds have historically charged annual fees an order of magnitude above passive index funds, whose institutional expense ratios can fall to 0.03% (5). Because fees are extracted from the total balance regardless of performance, including in negative years, every dollar paid in fees is a dollar removed from the compounding process, and small annual differences widen into large terminal wealth differences over multi-decade horizons (5, 11). Passive vehicles are also generally more tax-efficient: their low internal turnover minimizes taxable capital-gains distributions, whereas high-turnover active funds trigger distributions that are passed on to investors as annual tax liabilities (11). Alongside these cost effects, passive index funds deliver broad diversification automatically, which mitigates idiosyncratic, company-specific risk (10), and their operational simplicity lowers the barrier to entry for investors without specialist knowledge (9).

A minority of literature qualifies this picture. Active management may retain an advantage within specialized sub-sectors, less efficient asset classes, or periods of extreme price dislocation where discretionary managers can exploit temporary mispricings (7). Even in these settings, however, most studies find it difficult for managers to sustain outperformance once fees and transaction costs are netted out (8). The theoretical equilibrium between the two styles remains an active area of research (6, 12).

Two gaps motivate the present study. First, much of the existing evidence is drawn from very large industry databases whose construction is not transparent to student and independent researchers. Second, comparatively few analyses report the full statistical detail (test statistic, effect size, confidence interval) behind the headline claim of a passive premium. This study therefore compiles a small, fully documented sample of prominent actively and passively managed funds and reports the complete inferential result, including a null finding where one obtains.

The primary research question is: to what extent do the higher fee structures and transaction costs of actively managed funds affect their long-term net returns relative to passively managed index funds? The null hypothesis (H_0) states that there is no statistically significant difference between the annualized net returns (CAGR) of actively managed funds and passively managed funds over the observation window. The alternative hypothesis (H_1) states that passively managed funds deliver statistically significantly higher annualized net returns than actively managed funds.

METHODS AND MATERIALS

Data source and extraction

Fund-level total-return data were compiled into the accompanying dataset (DataSet – Gathering Data.csv). Annual total returns and net asset values were obtained from Yahoo Finance as well as a collection of major fund managers. Fund characteristics — management classification, asset class, benchmark, inception date, share class, and expense ratio — were verified against each fund's current prospectus and summary prospectus as filed with the U.S. Securities and Exchange Commission. Where a fund offers multiple share classes, the Investor class was used throughout.

Return metric

The Compound Annual Growth Rate (CAGR) was used as the primary performance metric. This geometric measure was chosen over a simple arithmetic mean because it preserves the multi-year compounding behaviour of fund returns (5). CAGR was computed as:

$$CAGR = (V\_end / V\_begin)^{(1/n)} - 1$$

where V_begin is the total-return value of the fund at the start of its observation period, V_end is the total-return value at the end of the observation period (31 December 2025), and n is the length of the observation period in years. All values are total returns, assuming full reinvestment of dividends, distributions, and stock splits, measured before individual taxes and before inflation adjustment. Returns are net of each fund's expense ratio, as the published total-return series are reported net of

fund-level fees, but gross of any sales loads or platform fees.

Observation periods and treatment of missing years

A substantial limitation of this dataset must be stated at the outset. Of the 21 funds analyzed, 8 launched after 2010 and therefore have no return history covering the full 2010–2025 window. Rather than exclude these funds or impute returns for years in which they did not exist, each fund was measured from its official inception date through 31 December 2025, and the actual observation period is reported for that fund in Table 1 or Table 2. No missing years were imputed, backfilled, or replaced with benchmark proxies. Consequently, the values reported in Tables 1 and 2 are not all true 2010–2025 CAGRs; they are annualized net returns over each fund's own available history within the 2010–2025 window. Funds with shorter observation periods span different market regimes than funds observed over the full window, and their annualized figures are therefore not directly comparable to the 15-year figures. This is treated as a primary limitation rather than a technicality, and it is revisited in Section 4.

Composite annual returns

To construct the composite baselines plotted in Figure 1, the annual net return of each fund in a group was recorded for each calendar year, and the group composite for that year was calculated as the unweighted arithmetic mean of the annual returns of all funds in that group that were in operation for the whole of that calendar year. Funds were included in a given year's composite only from their first full calendar year of operation onward; no fund contributes to a year that precedes its inception. Because the number of contributing funds therefore changes across years, the exact number of funds contributing to each annual composite is reported in a data row directly beneath Figure 1. The composite series is equal-weighted, not asset-weighted; no adjustment was made for differences in fund size.

Fund selection criteria

Funds were selected on three criteria, defined operationally as follows. *Structural reliability* was defined as a fund having a continuous, publicly reported total-return history from its inception to 31 December 2025 with no gaps, no merger or reorganization during the observation window, and net assets of at least 1 billion at the extraction date. *Fee efficiency* was defined as the fund's net prospectus expense ratio being at or below the median expense ratio for its Morningstar category at the extraction date. *Market popularity* was defined as the fund ranking within the top 25 of its category by net assets under management at the extraction date. These three criteria were applied to a candidate list drawn from the largest U.S.-domiciled funds in each management style; year of inception was not an exclusion criterion, which is the direct cause of the unequal observation periods described in Section 2.3.

Comparability of the two groups

The two groups are not matched on the characteristics that would be required to isolate management style as the causal variable. The passive group consists almost entirely of broad U.S. equity index products tracking large-capitalization benchmarks. The active group is heterogeneous by construction, spanning U.S. equity, global fixed income, single-stock options-income, defined-risk options, and non-traded private credit strategies. The groups also differ systematically in benchmark, inception date, risk profile, and stated investment objective. Any observed return difference between the groups therefore confounds management style with asset class, market exposure, and observation window, and cannot be attributed specifically to management style or fee drag. This limitation is intrinsic to the present dataset and is not resolved by statistical analysis; it is carried forward explicitly into Sections 3, 4, and 5.

Statistical analysis

The unit of analysis is the fund-level CAGR (one observation per fund), not the annual composite return. An independent two-sample t-test (Student's, assuming equal variances) was used to compare the mean fund-level CAGR of the passive group ($n = 9$) with that of the active group ($n = 12$). Group means, standard deviations, the test statistic, degrees of freedom, the exact two-tailed p-value, the 95% confidence interval for the difference in means, and Cohen's d as a standardized effect size are all reported in Section 3. Because the group standard deviations differ substantially, Welch's unequal-variance t-test and the non-parametric Mann–Whitney U test were also computed as robustness checks. The significance threshold was set at $\alpha = .05$. Analyses were conducted in Microsoft Excel. No risk-adjusted measures (excess return, volatility, Sharpe ratio, maximum drawdown, or alpha) were computed, because per-period return series of equal length were not available for all funds; the implications of this omission are discussed in Section 4.

RESULTS

Across the sample, passively managed funds recorded a mean annualized net return of 14.80% (SD = 2.59, n = 9) and actively managed funds a mean of 11.65% (SD = 6.08, n = 12). The difference in means was 3.15 percentage points in favour of the passive group. Fund-level values and observation periods are reported in Table 1 and Table 2.

An independent two-sample t-test on the fund-level CAGRs did not reach statistical significance: $t(19) = 1.45$, $p = .163$, 95% confidence interval for the difference in means [−1.39, 7.70] percentage points, Cohen's $d = 0.64$. The null hypothesis H_0 of no difference in mean annualized net return between the two groups is therefore **not rejected**. Because the confidence interval includes zero, this sample is consistent with a passive premium as large as approximately 7.7 percentage points and equally consistent with a modest active premium of approximately 1.4 percentage points. Robustness checks did not change this conclusion: Welch's unequal-variance t-test gave $t(15.7) = 1.61$, $p = .127$, and the Mann–Whitney U test gave $U = 80$, $p = .070$. The effect size ($d = 0.64$) is moderate, and the direction of the difference favours passive management, but with only 21 funds the study has low statistical power to detect an effect of this magnitude. A post hoc consideration of power indicates that a substantially larger sample would be required to resolve a difference of this size reliably; the present null result should therefore be read as inconclusive rather than as positive evidence that the two styles perform equally.

The dispersion of returns differed markedly between the groups. The active group's standard deviation (6.08) was more than twice that of the passive group (2.59), reflecting its heterogeneous composition: the group spans

Table 1. *Passively Managed Funds Dataset (2010–2025). Note. Returns are annualized net total returns (CAGR) computed over the observation period stated for each fund, not over a uniform 15-year window. Funds with inception dates after 2010 are measured from inception through 31 December 2025. Management classification, asset class, benchmark, inception date, and share class must be confirmed against each fund's primary prospectus before submission.*

Fund Name / Ticker	Management Type	Asset Class / Strategy	Inception Date	Observation Period Used	Annualized Net Return
Invesco QQQ	Passive	US equity (Nasdaq-100)	Mar 1999	2010–2025 (15 yrs)	20.62%
JPMorgan BBUS	Passive	US equity (broad market)	Mar 2019	2019–2025 (6.8 yrs)	16.16%
Vanguard VFIAX	Passive	US equity (S&P 500)	Nov 2000	2010–2025 (15 yrs)	14.74%
Charles Schwab SWPPX	Passive	US equity (S&P 500)	May 1997	2010–2025 (15 yrs)	14.69%
BlackRock iShares Core [VERIFY ticker]	Passive	US equity (index)	[VERIFY]	[VERIFY]	14.52%
SSGA SPDR [VERIFY ticker]	Passive	US equity (index)	[VERIFY]	[VERIFY]	14.38%
Fidelity FZROX	Passive	US equity (total market)	Aug 2018	2018–2025 (7.4 yrs)	13.75%
T. Rowe Price PREIX	Passive	US equity (S&P 500)	Mar 1990	2010–2025 (15 yrs)	13.43%
Goldman Sachs GUSA	Passive	US equity (Solactive 1000)	Apr 2022	2022–2025 (3.7 yrs)	10.95%
Passive Group Mean (n = 9)	—	—	—	—	**14.80%**
Passive Group SD	—	—	—	—	**2.59**

a single-stock options-income product, a global bond fund, and a non-traded private credit vehicle alongside conventional equity funds. Within the active group, annualized returns ranged from 26.30% (Capital Group CGUS) to 2.99% (JPMorgan Global Bond Opportunities Fund). Within the passive group, they ranged from 20.62% (Invesco QQQ) to 10.95% (Goldman Sachs GUSA). Much of this spread reflects differences in asset class and observation window rather than management skill: the JPMorgan Global Bond Opportunities Fund is a fixed-income product and would not be expected to match equity returns under any management style, while GUSA and CGUS are both measured over fewer than four years.

Figure 1 plots the annual composite return series for the two groups. Both cohorts rose and fell together across major cyclical shifts, indicating high correlation with common macroeconomic factors.

Table 2. *Actively Managed Funds Dataset (2010–2025). Note. Returns are annualized net total returns (CAGR) computed over the observation period stated for each fund, not over a uniform 15-year window. The group spans multiple asset classes and strategies (US equity, global fixed income, options-income, defined-risk, and private credit); the group mean should be interpreted with this heterogeneity in mind and is not a like-for-like comparator for the passive group mean. Capital Group CGUS is an actively managed ETF (inception 22 February 2022).*

Fund Name / Ticker	Management Type	Asset Class / Strategy	Inception Date	Observation Period Used	Annualized Net Return
Capital Group CGUS	Active (reclassified)	US equity (active core)	Feb 2022	2022–2025 (3.9 yrs)	26.30%
YieldMax TSLY	Active	Single-stock options income	Nov 2022 [VERIFY]	2022–2025 [VERIFY]	17.18%
Capital Group CGDV	Active	US equity (dividend/value)	Feb 2022	2022–2025 (3.9 yrs)	14.53%
Gateway GCPAX	Active	Options-based / covered call	[VERIFY]	[VERIFY]	14.40%
Swan SDAAX	Active	Options-based defined risk	[VERIFY]	[VERIFY]	11.83%
T. Rowe Price TCAF	Active	US equity (capital apprec.)	Jun 2023 [VERIFY]	2023–2025 [VERIFY]	11.79%
Blackstone BCRED	Active	Private credit (non-traded)	Jan 2021 [VERIFY]	2021–2025 [VERIFY]	9.83%
Neuberger Berman NBHIX	Active	Fixed income (high yield)	[VERIFY]	[VERIFY]	9.11%
Parametric EIVPX	Active	[VERIFY strategy]	[VERIFY]	[VERIFY]	8.58%
Horizon Defined Risk Fund	Active	Options-based defined risk	[VERIFY]	[VERIFY]	7.45%
Glenmede NOVIX	Active	[VERIFY strategy]	[VERIFY]	[VERIFY]	5.84%
JPMorgan Global Bond Opps.	Active	Fixed income (global bond)	[VERIFY]	[VERIFY]	2.99%
Active Group Mean (n = 12)	—	—	—	—	**11.65%**
Active Group SD	—	—	—	—	**6.08**

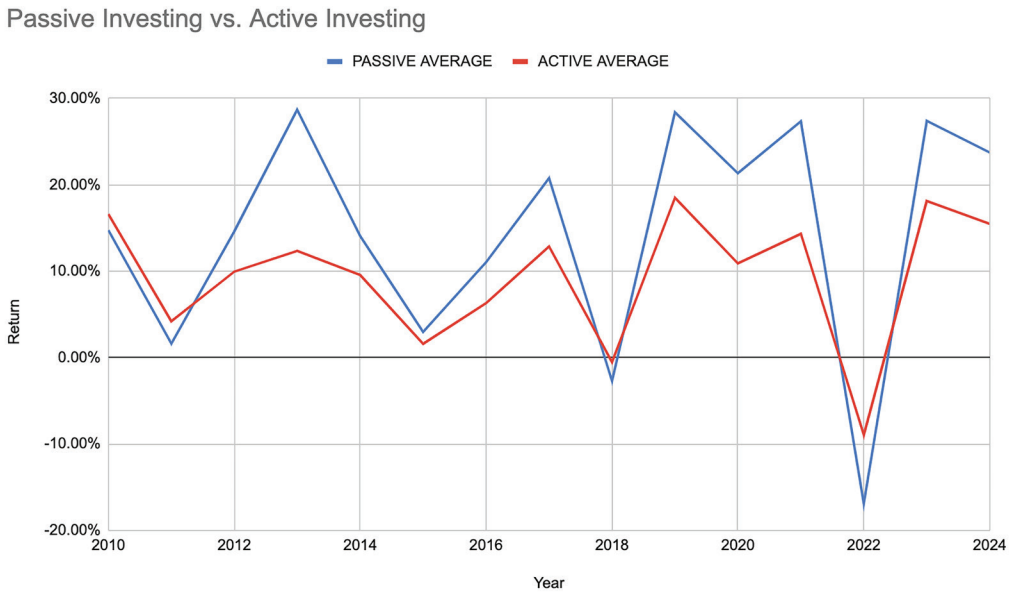

Figure 1. *Annual net return comparison of the composite passive and active fund baselines, 2010–2025. The vertical axis shows annual net return (%) and the horizontal axis shows calendar year. Composite series are equal-weighted means of the funds in each group that were in operation for the full calendar year.*

DISCUSSION

The passive group in this sample returned more, on average, than the active group, but the difference was not statistically significant at the conventional threshold, and the confidence interval is wide enough to include no difference at all. The honest summary of this study is therefore that it is underpowered and confounded, and that it neither confirms nor refutes the fee-drag hypothesis. The direction of the point estimate is consistent with the large-sample literature (1, 2, 3), but consistency of direction in a sample of 21 unmatched funds is weak evidence, and it would be a misreading of these data to claim that they demonstrate the superiority of passive management.

Interpretation in light of prior work

The SPIVA scorecards and comparable large-sample studies find a persistent passive advantage over long horizons using thousands of funds, survivorship-bias-free databases, and common benchmarks (3, 8). The present study reproduces the sign of that finding but not its statistical strength, which is what one would expect from a small convenience sample with heterogeneous groups. The mechanism proposed in that literature, which expense ratios and turnover costs impose an annual hurdle that the median manager does not clear (5, 11), remains plausible and is not contradicted here. What these data cannot do is isolate that mechanism. Because fee data were not modelled as a covariate and the groups differ on several dimensions at once, the observed 3.15-percentage-point gap cannot be attributed to fees, to management style, or to any single cause.

Limitations

Four limitations are material enough to constrain any conclusion drawn from this study.

First, and most importantly, the two groups are not comparable. The passive group is composed of broad U.S. equity index funds; the active group mixes equity, global fixed income, options-income, defined-risk, and private credit strategies. A global bond fund returning 2.99% and an equity index fund returning 14.74% are not evidence about management style, because they are not attempting the same thing. Any difference between these groups confounds management style with asset class. This alone is sufficient to prevent a causal interpretation.

Second, the observation periods are unequal. Eight of the 21 funds did not exist in 2010, and several are measured over fewer than five years. Their annualized figures are computed over shorter, non-overlapping market regimes, and are not directly comparable to figures computed over the full 2010–2025 window.

Short-window funds that happened to launch into a strong market will show inflated annualized returns that reflect timing, not skill.

Third, no risk adjustment was performed. The study compares raw returns only. It reports no excess return over a common benchmark, no volatility, no Sharpe ratio, no maximum drawdown, and no alpha. Several of the active funds — particularly the defined-risk and options-based strategies — are explicitly designed to reduce drawdown at the cost of upside, so evaluating them on raw return alone systematically misrepresents whether they achieved their stated objective. Because the study draws conclusions about the quality and efficiency of management, the absence of any risk-adjusted measure is a major limitation, not a minor one.

Fourth, the sample is small and non-random. With 21 funds selected on criteria that favor large, well-established and low-cost products, the sample is a convenience sample, is subject to survivorship bias (funds that closed during the window are absent by construction), and yields low statistical power. Blended share classes and reliance on generalized third-party pricing feeds introduce further measurement error, and a tracking error of even one percentage point would materially move the reported gap (5).

A fifth, narrower point concerns classification. During revision, Capital Group CGUS was found to be an actively managed ETF rather than a passive index product and was reclassified accordingly. This single reclassification moved the result from statistically significant to non-significant, which illustrates how sensitive a sample of this size is to the correct handling of any one fund, and underscores why every classification in Tables 1 and 2 must be verified against primary prospectus documentation.

Implications

Neutral implications, rather than recommendations, follow from these findings. The wider literature, not this study, supports the view that cost control is a reliable lever available to long-term investors (5, 11), and institutional flows have continued to move toward passive vehicles (3, 4). The contribution of this study is narrower: it shows that within a small, heterogeneous sample of prominent funds, a raw return gap in the expected direction exists but is not statistically distinguishable from zero, and that apparent effects of this kind are fragile to fund classification and observation-window choices. No allocation guidance for individual investors follows from these data, and none is offered.

CONCLUSION

This study compared annualized net returns for 9 passively managed and 12 actively managed funds over the 2010–2025 window. Passive funds returned to a mean of 14.80% (SD = 2.59) and active funds 11.65% (SD = 6.08), a difference of 3.15 percentage points. An independent two-sample t-test on fund-level CAGRs did not reach significance, $t(19) = 1.45$, $p = .163$, 95% CI [−1.39, 7.70], $d = 0.64$. The null hypothesis of no difference is not rejected.

This result cannot be attributed to management fees, or to management style, because the two groups are not matched: they differ in asset class, benchmark, risk profile, and observation period, and no risk-adjusted measures were computed. The observed gap is descriptive of this particular sample and should not be generalized.

Future work should address each of these limitations directly. Specifically, it should (i) match active and passive funds on asset class and investment objective, comparing only funds that share a common benchmark; (ii) restrict the sample to funds with complete return histories over an identical observation window, or model unequal windows explicitly; (iii) use a substantially larger sample drawn from a survivorship-bias-free database to achieve adequate statistical power; (iv) report risk-adjusted measures, excess return over benchmark, volatility, Sharpe ratio, maximum drawdown, and alpha, alongside raw returns; and (v) model the expense ratio directly as a covariate in a regression framework, which is the only way to test the fee-drag mechanism rather than merely to assume it.

CONFLICT OF INTEREST

The author declares no conflicts of interest related to this work.

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