Morningstar Extended Performance
Methodology

Morningstar Fund Research
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Contents

Executive Summary

The structure of an investment portfolio can change over time as the asset manager makes business decisions about distribution channels and the legal structure of the portfolio: A mutual fund may add a new share class or convert to an exchange-traded fund, and a private pool may register with the SEC for distribution to the retail investor.

The Morningstar Extended Performance methodology was developed to help investors see how a portfolio, as a whole, has performed over time by linking relevant investment performance over the portfolio lifecycle to "fill the gap" between the inception date of a new share class or distribution channels and the inception date of the original portfolio.

The following methodology paper should be read in conjunction with Morningstar's Oldest Share Class Methodology, explains the circumstances under which Morningstar considers funds eligible for extended performance, and documents how the calculation is performed.

This methodology is not a summary of local regulations and applies to the U.S. market only.

Introduction

The attribution of performance continues to be a well-recognized quantitative approach to identifying the outcome of investment decisions, and as the collection of investment offerings becomes larger, more complex, and consistently dynamic, it is important that investors have as much information as possible about the source of their investment performance. The Extended Performance capability lengthens the performance data that is available to younger investments by linking it to eligible share classes back to the oldest original share class, active or inactive.

For example, if a mutual fund started 15 years ago with an Investor share class and recently added an Institutional share class of the same portfolio, Morningstar will lengthen the performance history of the Institutional share class back to the Investor class' inception, calculating 15 years of performance history for the new class. In some cases, where the originally launched share classes have been liquidated, this may mean extending the performance by two or more share classes to "fill the gap" between the inception of the portfolio and the launch of the new share class.

Extended performance returns provide investors with more information to help them evaluate their investment choices. The inception date of a new distribution channel merely reflects a business decision—that is, when the fund company decided to expand its offerings. Extended performance, on the other hand, reveals the portfolio's full and complete performance history. Investors can use extended performance to evaluate how an investment manager has performed over time and through various market cycles. However, extended performance returns and ratings are not predictors of future performance. Investors should study extended performance returns and ratings together with other critical product information and attributes before investing in a mutual fund, collective investment trust, or variable annuity.

Extended Performance Eligibility

There are also cases when Morningstar will not extend investment performance for younger share classes. In virtually every scenario, Morningstar cannot ensure that the historical performance and strategies of the original portfolio are representative of the newer portfolio. To clearly articulate these acceptance criteria, Exhibit 1 below highlights the most common scenarios and their eligibility, followed by further discussion.

Exhibit 1 Scenario Eligibility Table

Eligible for Extended Performace	Not-Eligible for Extended Performance
All classes and channels are based on the same portfolio/pool of money, but they are priced separately to reflect different fees and expenses	The new portfolio is managed as a separate pool of money from the original portfolio
The fund changes its legal structure or domicile for business reasons and ceases to exist, but substantially all shareholders are transferred into the new successor fund/structure which also maintains the identical level of regulation	A fund moves from a lightly regulated to a more highly regulated situation, such as a Hedge Fund or offshore portfolio registering with the SEC as a registered 1940 Act fund
Feeder Funds based on the performance of the oldest feeder fund in a Master-Feeder structure	Spin-off/Clone Funds
1940 Act Open-End/ETF/Closed-End conversions, such as Open-End to ETF Conversions	Manager Moves
Variable Annuities where the underlying fund starts being offered as an open-end fund	Fund of Funds
Variable Annuity subaccounts based on the performance of the underlying funds	Composite Performance
	CIT Representative share classes
	CIT with unreported Net Expense Ratio

Source: Morningstar Data Content and Methodology Catalog.

Eligible for Extended Performance

Multi-Share Situations

In a multi-share situation, there are multiple share classes or distribution channels for a single investment portfolio. All classes and channels are based on the same pool of money, but they are priced separately to reflect different fees and expenses. For example, a fund might have share classes A, B, C, and I, and it might also be available through an insurance product, such as a variable annuity.[1]

1 Extended performance is commonly used in the variable annuity industry because insurance companies usually select underlying funds that have a long history of demonstrated performance.

Morningstar will calculate extended performance for the following multi-share situations. The rationale is the same for all cases:

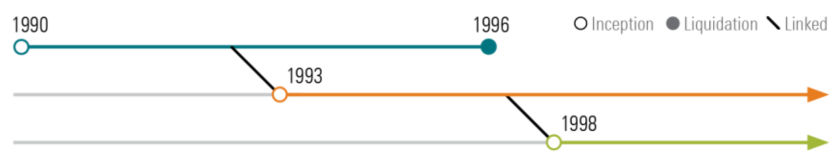
- Share classes or sub-accounts are based on the same underlying portfolio (single pool of money); and
- Any differences in performance can be attributed to differences in fees, and performance can be adjusted accordingly.

Multi-Share Examples

For a younger share class, Morningstar will calculate extended performance based on the performance of the oldest share class in the same fund.

In cases where the originally incepted share classes for a fund are liquidated, Morningstar will link together the performance of multiple share classes to extend the performance back to the fund's original inception date. The limitation, however, is that there must be an unbroken "chain" of share classes that were active from the original share class to the inception date of the share class receiving the extended performance.

Exhibit 2 Performance Linking of Multiple Share Classes Back to the Original Inception Date



Fund Class	A	B	C
Return Date Range	1990-1993–Extended	1993-1998–Extended	1998–Present
Share Class Returns	A–Linked	B–Linked	C
Fee Adjusted Factor	Between C and A	Between C and B	C

Source: Morningstar Direct. Data as of Dec. 31, 2022.

To identify the share classes to "chain link," the single-oldest active share class is chosen to begin the process. In Exhibit 2, fund class B is the oldest existing active share of the fund, as the original Class A was liquidated in 1996, and is already linked to B. Fund class B's performance from its inception date to the inception date of fund C is then used (the fee adjustments are discussed further in this paper).

Next, if older share classes of the fund are available, the process repeats and the oldest share class that was active on fund B's inception date is chosen (the share class need not be active currently). In the case above, fund class A's performance from its inception date to the inception date of the fund class B is then also linked to the performance of the fund class C (with any appropriate fee adjustments). This process is repeated until there are no longer any share classes that are active on the chain's first inception date that have an earlier inception date.

Morningstar will also calculate extended performance for all "feeder funds" based on the performance of the oldest feeder fund in a "master-feeder" fund structure.

Where a fund has both open-end and ETF share classes the extended performance calculation may use either the net asset value performance history of the ETF class or open-end class for the extension.

If a variable annuity underlying fund starts being offered as an open-end fund, Morningstar will extend the performance for the open-end fund based on the performance of the original variable annuity underlying fund.[2]

For variable annuities, Morningstar will calculate extended performance for sub-accounts based on the performance of the underlying funds.

Variable Annuities: If the sub-account invests in a share class that is not the oldest share class of the underlying fund, Morningstar will calculate extended performance for the sub-account based on the performance of the underlying fund linked back to the oldest share class of the underlying fund. For example, Exhibit 3 illustrates a variable annuity sub-account that invests in Share B of an underlying fund, which is younger than the A share class. In this case, the sub-account's performance is based on share B until inception, and then is linked to the oldest single active share class of the underlying fund: Class A.

Exhibit 3 Performance Linking to the Original Inception Date Using Underlying Fund

Fund Class	A	B	VA Subaccount (Based on B)
Return Date Range	1993-1998–Extended	1998-2000–Extended	2000–Present
Share Class Returns	A–Linked	B–Linked	C
Fee Adjusted Factor	Between A and B	B	Subaccount

Source: Morningstar Direct. Data as of Dec. 31, 2022.

Predecessor/Successor Situations

In a predecessor/successor situation, the fund changes its legal structure or domicile for business reasons. In this case, the original portfolio ceases to exist, and all shareholders are transferred into the new structure. An example of this is a closed-end to open-end fund conversion. Another example is a fund that changes its domicile from one country to another for tax reasons but otherwise keeps the fund structure and shareholders the same and is subject to the same level of regulation.

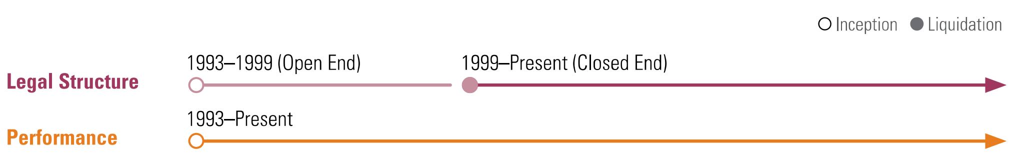
2 Variable annuity assets are held separately from the corresponding open-end fund for legal reasons. However, the variable annuity portfolio closely resembles the composition and securities of the corresponding open-end fund.

Morningstar will display extended performance for the following predecessor/successor situations. For these situations, shareholders were transferred from the old structure to the new structure at the time of the change. Therefore, the performance history of the original structure is relevant to the new structure, with no adjustments for fees. Because the returns are not adjusted for fees, Morningstar does not display these returns with any special graphic treatment. The returns of the original structure are continuous with the returns of the new structure.

A. Change in Domicile: If an investment portfolio changes its domicile (perhaps for tax reasons) but otherwise keeps its management and shareholders intact, the performance history from the original domicile will be carried through to the new domicile. The original domicile's portfolio must cease to exist after the move, there must not be any gaps in performance, and the regulatory environment must be similar.

B. Closed-End to Open-End Conversions: When a closed-end fund converts into an open-end fund structure, Morningstar will append the closed-end NAVs (not market prices) onto the record for the new open-end fund, so total returns will be available back to the start date of the closed-end fund. The closed-end structure must cease to exist after the conversion.

Exhibit 4 Closed-End to Open-End Conversions



Source: Morningstar Direct. Data as of Dec. 31, 2022.

Fee Adjustments for Multi-Share and Predecessor/Successor Situations

Morningstar's treatment of fees is different for multi-share and predecessor/successor situations.

- In a multi-share situation, Morningstar will adjust the performance history of the original portfolio to reflect differences in fees between the original share class and the younger share class. This adjustment will only occur where the new share class has higher fees than the oldest share class, so the extended performance for the younger share class will be lower than, or equal to, the returns of the oldest share class. Where the oldest share class has higher fees than the younger share class, no adjustment is made.
- In a predecessor/successor situation, Morningstar will use the unadjusted performance of the original portfolio to extend the performance of the new entity. In these cases, the shareholders of the original portfolio structure were transferred into the new structure when the original structure was discontinued. Therefore, the unadjusted performance of the original portfolio best describes what those investors experienced.

Not Eligible for Extended Performance

The key factors that make funds ineligible for extended performance are when the new portfolio is managed as a separate pool of money from the original portfolio, or when a fund moves from a lightly regulated situation to a more highly regulated environment. Morningstar does not extend performance in these cases, because it is likely that the performance of the two funds will diverge.

Separate Pools

- First, two separate portfolio managers may make independent decisions about which securities to purchase and how much cash to keep on hand.
- Second, different-size portfolios face different investing opportunities. When one fund is significantly larger than another, the larger fund is at a pricing disadvantage when buying and selling significant positions in a stock.
- Lastly, if the two portfolios are managed by different firms, the resources available to the managers and the fees charged will vary.

Unregistered to Registered SEC 1940 Act Investments

Historically, the limitations on registered funds' portfolio construction, associated with leverage and liquidity as an example, have empirically demonstrated that the related performance is an unreliable proxy for the successor registered fund. Morningstar has deemed this performance to be ill-suited for most investors.[3]

The Investment Company Act of 1940 (or '40 Act) exempts hedge funds and other private funds from registration and regulation under the SEC. The distinction underpinning the registration versus the non-registration exemption is for the protection of retail or non-accredited investors versus "qualified" or "accredited" investors, where it is assumed that qualified and accredited investors have a sufficient net worth to take on more investment costs and market uncertainty. Similarly, these qualified investor populations should have more knowledge of the securities they're purchasing, and they can tolerate more risk.

Furthermore, sometimes these private entities, without being compelled to do so by law, can register with third-party industry commissions, such as the Commodity Futures Trading Commission, which maintains its own rules and requirements (including memoranda of understanding with the SEC). In that spirit, non-SEC commissions on private vehicles include lighter rules, fewer enforcement actions, and limited reporting requirements in materials such as schedule of portfolio holdings and census data, which are essential to Morningstar Categorization and Morningstar Rating methodologies, and for the protection of the unqualified retail investor.

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3 From 2010 until 2017, Morningstar permitted related performance of hedge fund to open-end conversions to be displayed without calculating ratings. After observing the empirical data, our opinion diverged from the SEC, deeming it a bad indicator of strategy performance in the new regulated structure.

What is in common among these regulations is that they share the distinction with the SEC between "qualified" or "accredited" investors and retail or non-accredited investors. The SEC regulations and enforcement of the law protect investors from any excess in the market, specifically targeting retail and non-accredited investors.

Therefore, there can be varying degrees of rules, enforcement actions, and even the purpose of the law. In that spirit, Morningstar is as cautious as possible when extending performance when investments move between these varying regimes. Morningstar serves as a steward to retail or non-accredited investors' interest and does not extend performance of all instances of a limited partnership into a registered fund. Some limited reasons behind this methodology are set forth below.

Transparency of Share Class Selection for Registration

It is always possible that a private/unregistered fund is part of a broader launch of strategies where the best-performing classes could be converted to '40 Act funds, taking advantage of survivorship bias. There is no reasonable enforcement or methodology in the share class selection for registration.

Investment Strategy Consistency

The SEC requires that funds citing their past performance are managed following a similar investment strategy, but that does not mean identical. There isn't any specific way to confirm whether the investment strategy has changed, owing to the weakness of unregistered reporting requirements.

Compulsory Reporting Requirements

Hedge funds and many other non-registered pools are not required to report their census data or portfolio holding schedules, making it unclear how to conduct performance attribution. Without consistent portfolio holdings reporting, which is required for '40 Act funds via N-Port filings on a quarterly basis, performance information cannot be validated and can include multiple biases, so it's reasonable to trade data quantity for quality.

Peer Group Comparability

Non-registered performance interpolated with registered performance in peer groups of since-inception '40 Act funds would introduce nonconformity to the regulatory environments in which the fund operated and performed, potentially confusing investors about the origin of the performance affecting future expectations/purpose of the investment in an investor's portfolio. Morningstar's regulated '33 and '40 Act databases only contain investment performance as of the registration of the pool, and the inclusion of fund performance for those that started outside of these environments with unregulated performance would not be fair.

Morningstar will not extend performance under the following additional circumstances:

Spinoff/Clone Funds

If an asset manager creates a new and separate portfolio based on the investment style of an existing portfolio, Morningstar will not extend the performance of the new fund based on the performance of the old fund, even if the portfolio objective and strategy are substantially similar, and even if the new portfolio is being run by the same manager.

Reason: Once the pool of money becomes separate from the original portfolio, it may be managed differently. Therefore, the performance of the old fund is not necessarily representative of the new portfolio.

Manager Move

If a portfolio manager becomes employed by a new asset manager, Morningstar will not use the manager's prior performance at the old firm to extend the performance of a new fund at the new employer.

Reason: Morningstar believes that in addition to the portfolio manager, the asset management company's policies, research staff, trading costs, and fees also influence the returns. Therefore, the manager's prior performance at an old firm is not representative of the situation at the new firm. The CFA Institute concluded that a manager's prior work experience may be presented as supplemental information (for example, in an advertisement), but normally, it may not be linked to the ongoing performance of the new portfolio.

Funds of Funds

Morningstar will not extend performance for a "fund of funds" based on the extended performance of the underlying funds.[4] Funds of funds invest in a combination of other funds and usually apply a wrap fee.

Reason: At first glance, it may seem that a fund of funds should be eligible for extended performance. In theory, the performance of the fund of funds should be based on the weighted average of the returns of the underlying funds. However, Morningstar will not extend performance for a fund of funds for two reasons.

First, Morningstar may not have extended performance data on all the component funds. Second, Morningstar does not know what the fund's historical allocation has been. For example, a fund of funds may be currently investing 30% in a growth fund, 40% in an international fund, and 30% in a bond fund. These weights and even the component funds may have changed, so Morningstar does not have a reliable way to derive the extended performance for a fund of funds.

4 In the U.S., Morningstar will extend performance for 529 college savings plans, which are structured as a fund of funds.

Composite Performance

Morningstar will not extend portfolio performance based on the performance of a related composite. Portfolio composites represent an asset manager's average performance for a given investment style. These are usually created when the management company has slightly different portfolios for each investor. For example, separate account investors have unique tax needs and security preferences, and each investor holds the securities directly, rather than owning shares of a fund. If a separate account manager decides to start an open-end fund or CIT, Morningstar will not use the separate account composite returns to extend the performance of the open-end fund or CIT.

Reason: The CFA Institute outlines rules for composite construction in its Global Investment Performance Standards. However, there is still some manager discretion involved in determining exactly which portfolios get included in the composite. Also, Morningstar products are not equipped to display the disclaimers that the CFA Institute requires for composite performance.

CIT Representative Share Classes

Morningstar will not extend performance for a CIT "representative share classes," also sometimes referred to as "gross of management fee" share classes. Per Morningstar's Oldest Share Class Methodology, CIT representative share classes also cannot function as the parent (oldest) share class from which newer (child) share class extended performance is derived. Morningstar defines a CIT representative share class as one in which all or a portion of the expense ratio fee is omitted because it is always negotiated on a per-client basis and charged separately.

Reason: The final fee and performance is considered client-specific to the qualified retirement plan and therefore cannot be used in the extended performance methodology as the full fee will not be reported.

CIT Missing Net Expense Ratio

Morningstar will not extend performance for a CIT share class that does not report a net expense ratio or reports a "0" as the net expense ratio. CIT classes missing a net expense ratio also cannot function as the parent (oldest) share class from which the newer (child) share class extended performance is derived.

Reason: The required fee data to calculate extended performance is not available.

Morningstar Extended Performance Methodology

For details of how Morningstar determines the oldest share class in the event of multiple share classes having the same inception date, please see the Oldest Share Class Methodology paper.

For predecessor/successor situations, the performance of the original portfolio is not adjusted but is instead appended to the records of the new portfolio. The methodology below is used only for multi-share situations where the historical performance of the original portfolio is adjusted for fees.

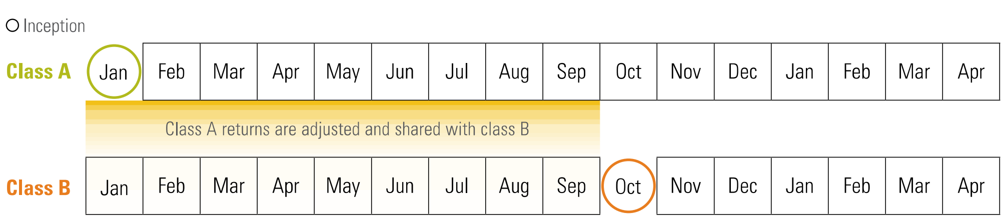
For multi-share situations, Morningstar will adjust the historical total returns of the oldest share class ("parent") to reflect the fee structure of the younger share class/channel ("child"). The parent fund monthly returns (prior to the child's inception) are adjusted for fees, and then this data is attached to the child record. Then, the string of adjusted plus actual monthly returns for the child is compounded into historical trailing returns. The fee adjustment is necessary because expenses reduce the net returns to shareholders.

There are four steps in the calculation of fee-adjusted extended performance returns.

1. Calculate an annual adjustment factor that expresses the fee differential between the parent fund's annual expenses and the child's annual expenses.
2. Calculate a monthly adjustment factor based on the annual factor.
3. Use the monthly factor to adjust the parent's historical monthly returns prior to the inception of the child fund and transfer the data to the child.
4. Compound the child's extended performance pre-inception monthly returns with its actual post-inception returns to create trailing total returns.

For example, class A started in January and class B in October. Class A returns from January through September are adjusted and shared with class B.

Exhibit 5 Share Class Adjusted Performance Timeseries



Source: Morningstar Direct. Data as of Dec. 31, 2022.

With this data, Morningstar can calculate additional variations on extended performance (for example, load-adjusted returns, Modern Portfolio Theory statistics, and extended performance ratings).

Morningstar recalculates historical monthly returns for all funds at the end of each month. The extended performance calculations use the fees that are most current in the databases.

1. Annual Fee Adjustment Factor

The annual fee adjustment factor measures the excess yearly fees paid by the child. Morningstar adjusts for only those fees that tend to differ between share classes. For funds based in the U.S., Morningstar only adjusts for the management (advisor) fee and distribution (12b-1) fee.

For CITs, since different fee components are not collected, Morningstar only adjusts for the net expense ratio.

$$f_A = Max\{0, (F_c - F_p)\} \qquad (1)$$

where

fA = the annual fee adjustment factor

Fc = select fees for the child, expressed as a decimal (gross of any temporary fee waivers)

- For a U.S. open-end fund, Fc = sum of the child's management fee and distribution fee (for example, 12b-1)
- For a U.S. variable annuity, Fc = sum of the parent's management fee, distribution fee and the additional insurance expense of the sub-account (insurance expense includes M&E, administration, and distribution)[5]
- For a U.S. CIT, Fc = the child's net expense ratio fee

Fp = select fees for the parent fund, expressed as a decimal

- For a U.S. open-end fund, Fp = sum of the parent's management fee and distribution fee (for example, 12b-1)
- For a U.S. CIT, Fp = the parent's net expense ratio

Max = a function that chooses the greater of two numbers

For example, Class B (child) has a management fee of 1.74% and a distribution fee of 1.00%. Class A (parent) has a management fee of 1.41% and a distribution fee of 0.25%. The fee adjustment factor is calculated as follows:

$$fA = Max\{0,(0.0174 + 0.0100) - (0.0141 + 0.0025)\} = 0.0108$$

The "max" function is in place to ensure that each adjusted monthly return for the child is not higher than the respective parent fund return. Morningstar takes this conservative approach in order to not overstate the possible returns the child fund could have earned.[6]

If the child has higher expenses than the parent fund, the adjustment factor will be greater than zero and the child monthly returns will be less than the parent fund returns.

5 In the case of a variable annuity sub-account, the investor pays both the fees of the underlying fund and the fees of the sub-account.

6 This follows the recommendation of the SEC, as outlined in the 1997 no-action letter to the Quest For Value fund.

Conversely, if the child has lower expenses than the parent, a factor of zero is used and the child return is equal to the parent return (no adjustments).

This adjustment is only applicable to each pre-inception monthly return for the child. The child trailing returns (for example, three-year annualized) can be composed of both actual monthly returns and extended performance monthly returns. Therefore, it is possible that the child trailing return may exceed the parent trailing return.

Morningstar will make an exception to the annual fee adjustment factor when the oldest share class is the share class where a lower 12b-1 is reported because additional 12b-1 fees are included in Other Expenses and the younger share class has a 12b-1 fee that includes all the 12b-1 expenses. In this instance, the younger share class would be further penalized owing to the way the extended performance calculation compares these 12b-1 fees. In this instance, Morningstar compares the overall expense ratios of the two share classes. When the younger share class' expense ratio is less than the older share class' expense ratio, we set the monthly adjustment factor equal to zero. This exception does not apply to CITs.

2. Monthly Fee Adjustment Factor

The monthly fee adjustment factor is derived from the annual fee adjustment factor with the geometric method below:

$$f_M = (1 + f_A)^{\frac{1}{12}} - 1$$

where

fM	=	the monthly fee adjustment factor
fA	=	the annual fee adjustment factor

For example, if the annual fee factor is 0.0108, the monthly fee factor is calculated as follows:

$$f_M = (1 + f_A)^{12} - 1 = (1 + 0.0108)^{12} - 1 = 0.0008955$$

3. Adjusted Pre-Inception Monthly Returns

Once the monthly fee factor has been determined, pre-inception monthly returns for the child can be calculated. The fee factor is applied to each parent fund's monthly return prior to the child's inception.

$$R'_{Ct} = 1 - \frac{1 + R_{Pt}}{1 + f_M} - 1$$

where

R'Ct	=	the extended performance pre-inception monthly return for the child for month (the prime symbol is used to differentiate between actual returns and adjusted returns)
RPt	=	the parent fund's historical monthly return for month t

fM	=	the monthly fee adjustment factor

For example, if the parent fund monthly return is 1.09%, the annual fee factor is 0.0108, and the monthly fee factor is 0.0008955, the extended performance return for the child is calculated as follows:

$$R'_{Ct} = 1 - \frac{1+R_{Pt}}{1+f_M} - 1 = \frac{1+0.0109}{1+.0008955} - 1 = 0.00999 = 1.00\%$$

The parent fund return is 1.09% and the child extended performance return is 1.00%. In this case, the child has higher fees than the parent fund, so the child returns are lower than the original parent fund returns.

If the child fund started in the middle of a month (for example, March 15), Morningstar will use the adjusted parent fund return for the full month, rather than a partial month of adjusted parent returns (March 1-15) plus a partial month of actual child returns (March 15-31).

If the parent fund started in the middle of the month, the adjusted return for the child for this partial month is as follows. (This adjusted partial month would be used to calculate the since-inception extended performance return for the child fund, back to the parent fund's inception date.)

$$R'_{Ci} = \frac{1 + R_{Pi}}{1 + \frac{f_M d_e}{d_m}} - 1$$

where

RCi	=	the extended performance partial-month return for the child
RPi	=	the parent fund partial month return for the inception month
de	=	the number of days between the parent fund inception date and the end of the inception month
dm	=	the number of days during the inception month
fm	=	the monthly fee adjustment factor

The result is the extended performance partial-month return for the child for the parent fund's inception month.

4. Child Trailing Returns

The adjusted historical monthly returns can be compounded with the child's actual returns to create trailing multi-period returns for the child.

For example, if the child share class started eight months ago and the parent share class started five years ago, Morningstar can calculate total returns for the child for up to five years. Morningstar will adjust the parent's monthly returns and will compound those adjusted monthly returns with the child's actual monthly returns.

Exhibit 6 Child Trailing Returns

		3-Month	1-Year	3-Year	5-Year
	Parent	0	4	28	52
+	Child	3	8	8	8
	Total Months	**3**	**12**	**36**	**60**

Source: Morningstar Direct. Data as of Dec. 31, 2022.

Extended Performance Ratings

Extended performance monthly returns are calculated for multi-share situations and monthly returns are carried over for predecessor/successor situations when the conversion is a registered '40 Act to a registered '40 Act investment (that is, closed-end fund to open-end fund). Once the monthly returns are in place, other performance-based measures can be calculated from the derived data. For example, a trailing total return can be adjusted for the effects of loads to calculate a load-adjusted return.

In addition to returns, Morningstar also calculates the extended performance Morningstar Rating for new share classes/channels. Morningstar uses actual plus extended performance monthly returns to calculate the load-adjusted, extended performance Morningstar Risk-Adjusted Return for the three-, five-, and 10-year time periods. (For more information, please see the document entitled "The Morningstar Rating Methodology.") The extended performance risk-adjusted returns are used to determine the extended performance rating.

Every month, Morningstar ranks all funds (or sub-accounts) in each Morningstar Category by their three-, five-, and 10-year risk-adjusted returns. The 1- through 5-star ratings for each period are based on a bell curve distribution of the funds in each category. The bell curve is based on funds with actual returns only; extended performance results are not included when these breakpoints are determined. Then, Morningstar uses the rating breakpoints for the actual returns to assign the extended performance ratings.

For example, if a fund's three-year extended performance risk-adjusted return was 7.00%, its three-year extended performance rating would be 4 stars, according to the table below for this specific Morningstar Category for this sample month.

Exhibit 7 Risk-Adjusted Performance Breakpoints

	Rating Type		
	3-Year	5-Year	10-Year
Count by Funds	32	29	16
Breakpoints			
Max	11.5	5.89	4.06
5 to 4	9.07	4.55	3.58
4 to 3	5.52	2.93	2.84
3 to 2	4.05	1.97	2.01
2 to 1	1.99	1.39	1.78
Min	0.99	0.48	0.32

Source: Morningstar Direct. Data as of Dec. 31, 2022.

The Overall Morningstar Rating is a weighted average of the three-, five-, and 10-year ratings. If the fund/sub-account has not experienced any category changes, the weights for the overall rating are as follows:

Exhibit 8 Overall Morningstar Rating (%)

	3-Year	5-Year	10-Year
36–59 months	100	—	—
60–119 months	40	60	—
> 120 months	20	30	20

Source: Morningstar Direct. Data as of Dec. 31, 2022.

Overall Rating for Multi-Share Open-End Funds and CITs

For multi-share open-end funds and CITs, the Overall Morningstar Rating will be either based on actual performance only or extended performance only. Once the share class turns three years old, the overall rating will be based on actual ratings only.

Exhibit 9 Overall Rating for Multi-Share Open-End Funds

	Rating Type			
Share Class	3-Year	5-Year	10-Year	Overall (Weighted Average)
A	Actual	Actual	Actual	3/5/10
B	Actual	Actual	Extended	3/5
C	Actual	Extended	Extended	Based on 3-Year Rating Only
D	Extended	Extended	Extended	3/5/10

Source: Morningstar Direct. Data as of Dec. 31, 2022.

Overall Rating for Multi-Share Variable Annuities

For multi-share variable annuities, the Overall Morningstar Rating is a weighted average of any ratings that are available.

Exhibit 10 Overall Rating for Multi-Share Variable Annuities

	Rating Type			
Share Class	3-Year	5-Year	10-Year	Overall (Weighted Average)
A	Actual	Actual	Actual	3/5/10
B	Actual	Actual	Extended	3/5/10
C	Actual	Extended	Extended	3/5/10
D	Extended	Extended	Extended	3/5/10

Source: Morningstar Direct. Data as of Dec. 31, 2022.

Graphic Display

To differentiate between extended performance that has been adjusted and actual performance, Morningstar has established design standards for presenting this information.

For multi-share situations, Morningstar displays extended performance returns with italicized numbers and extended performance ratings with hollow stars.

Exhibit 11 Morningstar Data Formatting and System Displays

	Overall	3-Year	5-Year	10-Year
Valuation Multiples	★★★★★	★★★★★	★★★★	★★★★★
Valuation Multiples	★★★	★★★★	★★★	☆☆☆☆
Total Return %	10.68	9.05	12.21	10.26
Load Adjusted Return %	8.56	7.15	10.52	8.79
Morningstar Rating™	★★★	☆☆☆☆	★★★	★★★★

Source: Morningstar Direct. Data as of Dec. 31, 2022.

There is no special visual treatment for predecessor/successor situations, because the returns are not adjusted. Shareholders in the original portfolio were transferred over to the new portfolio structure and so the returns are continuous. Morningstar will analyze whether these structural changes are significant or not. If the change is deemed a "significant restructure" Morningstar will suspend rankings and ratings until the new structure has sufficient independent history. The performance will remain available for analysis by investors.

These extended performance returns are highlighted in italics, and any ratings based on this data are displayed as hollow stars.

Conclusion

The investment industry will continue to grow and to add classes of shares or sub-accounts to existing investment portfolios. As this collection of offerings becomes larger and more complex, it is even more important that investors have as much information as possible to make educated decisions about their investments. Extended performance lengthens the performance of a younger share class or sub-account based on the established history of the original portfolio. Investors can use the extended performance returns and ratings to determine how a younger product could have performed had it been in existence as long as the original share class. In the absence of extended performance, investors in younger funds and sub-accounts are left with a void of data.

Extended performance returns and ratings are not predictors of future performance. Investors should study extended performance returns and ratings together with other critical product information and attributes before investing in a mutual fund, CIT, or variable annuity.

Document Version History

Version 1.0	March 31, 2011	Original publication
Version 1.1	Oct. 31, 2016	Revision including ability to extend with liquidated share classes.
Version 1.2	Aug. 31, 2017	Removal of Hedge Fund to OE conversions, Incl. Multi-share CIT
Version 1.3	Jan. 31, 2023	Clarification of Non-1940 Act Fund Eligibility

22 West Washington Street
Chicago, IL 60602 USA