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After-Tax Benchmarking: Developing an Industry Standard to Level the Playing Field

Authored by

Jonathan Boersma, CFA
Brad Waitsman, CFA
Eric Linker, CFA

Abstract

Tax alpha is defined as the difference between the after-tax excess return and the pre-tax excess return. The after-tax benchmark used for calculating the after-tax excess return, therefore, is critical to measuring tax alpha. Standardizing the methodology for calculating after-tax benchmarks promotes consistency, transparency, and comparability.

To accurately measure an investment manager's ability to add value on an after-tax basis, the benchmark used must reflect the following key drivers of after-tax performance:

- Initial Account Funding (Cash or In-Kind Securities)
- Capital Inflows and Outflows
- Capital Gains and Losses from Outflows (Short-Term and Long-Term)
- Rebalancing Impacts of In-kind Flows
- Benchmark Income (Qualified and Non-Qualified)
- Benchmark Capital Gain/Loss Realization/Turnover
- Federal Tax Rates (Anticipated Client Rates or Maximum Federal Rates)

The recommended approach to capture these factors is through a shadow benchmark. The article provides detailed guidance on building a shadow benchmark, including considerations for constituent-level versus total-level data, selecting a market index or proxy, and incorporating client portfolio events.

Key Highlights

- Choosing an appropriate after-tax benchmark is critical to calculating tax alpha.
- Among various options, a shadow benchmark best captures a client's taxable events, offering the fairest comparison to evaluate an investment manager's actions. While this approach is more complex than other options, the results produced more accurately capture the value added by the manager and outweigh the complexity concerns.
- Building a shadow benchmark involves replicating the client's portfolio characteristics at a total level. It incorporates client-specific events like capital inflows/outflows, rebalancing, and tax rates, and requires ongoing maintenance to accurately reflect market movements and tax implications.

Keywords

After-tax, benchmarks, shadow benchmark, tax alpha

For individual investors, the most meaningful basis for evaluating investment performance is after fees and taxes. This is the performance that the client actually earns. Comparing this performance against a relevant benchmark is an important measure of the true value added by an asset manager. While pre-tax benchmarks exist in abundance and allow for comparison with the client's strategy or objective, after-tax benchmarks are a much more complex challenge. To truly be relevant, an after-tax benchmark needs to be customized for each client, reflecting the client's tax rates, initial funding activity, inception date, capital flows, and cost basis. Although standards[i] exist for calculating after-tax portfolio returns, the same is not true for after-tax benchmarks. A calculation methodology for after-tax benchmarks remains inconsistent and immature. The disparate models used by asset managers today do not lend themselves to transparency or comparability, which are two essential measures to gain and maintain investor trust. Both investors and investment managers need a relevant benchmark to assess performance appropriately and facilitate fair comparisons.

I. SELECTING AN AFTER-TAX BENCHMARK METHODOLOGY

A. Guiding Principles

The development of the benchmark methodology is guided by a few key principles. The methodology should:

- Meet regulatory and industry standards
- Produce a benchmark result that is tailored to the investment strategy and the individual investor's capital flows, cost basis, and tax rates
- Fairly and objectively evaluate how a manager adds value from an after-tax perspective
- Utilize the same underlying index as the pre-tax benchmark
- Balance complexity and technical accuracy (with reasonable assumptions) to implement and scale across product lines
- Be transparent, explainable, and verifiable to external parties, including clients

B. After-Tax Benchmark Approach Options

There are several approaches that can be used to create an after-tax benchmark, including: using the after-tax version of standard indices, applying an event-based approach, using an adjustment methodology, and creating a shadow benchmark. When comparing these approaches against the guiding principles, one clearly stood out as the preferred option. Below is a description of these options and how each relates to the guiding principles established:

[i] CFA Institute USIPC After-Tax Performance Standards - GIPS. GIPS® is a registered trademark of CFA Institute.

1. After-Tax Return Version of Standard Indices

The pre-tax version of a readily available market index is recognizable to the average investor. The underpinnings of the returns for these benchmarks simulate the after-tax version of their respective pre-tax benchmark by using historical information on capital gains and dividends for the index. These indices only capture the tax liability from income and a simple assumption of capital gains/losses over time, not gains/losses associated with client-specific tax circumstances, including tax rates. One of the primary considerations in the selection of an after-tax benchmark approach, as it relates to the guiding principles, is that it captures the client's capital flows, cost basis, and tax rates to provide a fair assessment of how a manager adds value from an after-tax perspective.

Benefits	Limitations
• Less complex calculations • Relies on independently published, standardized data for computing benchmark returns • Promotes simple comparison across managers • Useful for composite reporting since it covers a wider range of portfolios	• Does not reflect individual client capital flows or cost basis • Does not allow for client-specific tax rates • Requires different tables for historical returns for different portfolio inception dates • External validation of the return calculation is challenging

Recommendation: The use of an After-Tax Return version of Standard Indices is not recommended because one of the guiding principles of an after-tax benchmark is to capture the individual investor's capital flows, cost basis, and tax rates. These indices only capture the tax liability from income and a simple assumption of capital gains/losses over time, not gains/losses associated with client-specific tax circumstances. While this option provides significant benefit in terms of ease of comparison between managers and does not require complex calculations, it is due to its simplicity that it does not offer a fair comparison when trying to measure tax alpha.

2. Event-Based Approach

This option creates an alternative portfolio by applying a 'what-if' scenario analysis to an investment manager's decision-making for non-discretionary taxable events in the client's portfolio (Arany et al. 2024). It does so by evaluating the actual tax-aware choice made by the investment manager for each event compared to an alternative choice, if tax implications were not considered. The difference between the alternative portfolio's taxable portion of its return less that of the actual portfolio's taxable portion of its return is the tax-alpha earned by the investment manager. This approach also relies on the manager to determine the alternative tax-agnostic decisions they would have made in lieu of the decisions already made. Determination of an alternative tax-agnostic decision can be subjective and conflicts with the guiding principle for fairly and objectively evaluating how a manager adds value from an after-tax perspective. This is primarily due to its lack of transparency and ability to be verified by external parties. In addition, this approach only works for single, independent taxable events and multiple events cannot be linked. Subsequent events, treated independently of prior events, risk overstating tax alpha by taking advantage of losses on the same security a second time.

Benefits	Limitations
• Does not require as many data inputs as the shadow benchmark option (i.e., tracking impacts of in-kind flows) • Does not require establishing and maintaining a passive representation of a benchmark • Easier to implement compared to a shadow benchmark	• Comparison is to an alternate version of the portfolio and does not offer a comparison against a passive representation of the benchmark • Can be seen as ambiguous and biased since it requires manager input for what the alternative action would be if they had not taken taxes into account • Does not capture all taxable implications from capital flows, including gains/losses from rebalancing of in-kind flows • Requires tracking dividend-received amounts for all constituents

Recommendation: The use of an Event-Based approach is not recommended because it does not align with several of our guiding principles. This method is not viewed as being independent and transparent to external parties since the very nature of this approach depends on the investment manager determining the alternative tax-agnostic decisions they would have made in lieu of the decisions already made. This option is also unlikely to be adopted by the industry as it is not listed in the USIPC guidance.

3. Adjustment Methodology

This option attempts to make the after-tax benchmark more reflective of each client's unique tax situation without maintaining a full shadow benchmark for each portfolio. An example of this is done by calculating a percentage adjustment factor that, when applied to the benchmark, aligns the unrealized gains/losses in the benchmark with those in the portfolio. This results in an after-tax benchmark that is more comparable to the client's unique tax circumstances and, therefore, a more meaningful measure of after-tax performance. This approach conflicts with our guiding principles as it is not currently recognized by industry standards and is not easily explainable to peers and clients. While it attempts to reflect the tax implications of each client, it does so by approximating gains and losses instead of capturing those resulting from each client's capital flows and cost basis.

Benefits	Limitations
• Easy to calculate • Scalable for large numbers of portfolios • Allows for client-specific tax rates	• Approximates realized gain/loss impacts • Difficult for clients to understandNot used by industry peers

Recommendation: The use of an Adjustment Methodology for after-tax benchmarks is not recommended. One of the primary goals of any methodology recommendation is to establish a standard that may be accepted and utilized across the industry. This option is unlikely to be adopted by the industry as it is not listed in the USIPC guidance and is challenging for peers and clients to understand. Similar to the standard indices approach, it also does not reflect individual client capital flows or cost basis.

4. Shadow Benchmark

This option creates a paper portfolio based on the portfolio investment strategy and mandate that reflects what an investor would have earned, after taxes, if the investor had invested passively in the benchmark index. After-tax returns on the shadow benchmark are computed by replicating the investor's capital flows, cost basis, and tax rate(s) in a shadow benchmark. While an argument can be made that a shadow benchmark may be a complex undertaking, the authors believe the results produced outweigh any perceived complexity associated with this option. A shadow benchmark adheres to each of the other guiding principles and can limit complexity without compromising accuracy by taking a simplified approach to implementing key elements. These elements are discussed later in this paper and include maintaining the shadow benchmark at the total level rather than the constituent level, applying simplified tax rates, and minimizing the number of tax lots. The concept of a shadow benchmark was suggested in the various industry papers (Stein 1998; Stein et al. 1999; Arany et al. 2024), the USIPC After-Tax Performance Standards (CFA Institute 2011), and further explored in two papers by Parametric Portfolio Associates (Parametric Portfolio Associates 2019; Sireklove, J., 2020).

Benefits	Limitations
• Reflects individual client capital flows and cost basis • Allows for client-specific tax rates • Provides a more precise measure of tax alpha • While complex, it is a more straightforward method to explain to clients	• Requires tracking and application of additional data components for correct tax liability treatment (e.g., client capital flows, cost basis, tax rates, income, gain/loss approximation, returns, etc.) • Not easily comparable across managers due to inconsistent assumptions, different client tax considerations, and start dates • Embedded implementation challenges for some firms (e.g., cost of data, complexity of calculations, tax accounting, and performance measurement systems) • Does not provide a perceived objective measure if not calculated by an independent source

Recommendation: Utilizing a shadow benchmark is the best choice for developing after-tax benchmarks. Even though a shadow benchmark will require additional data and effort to implement, it is the only option that accurately captures the specific tax status and capital flow impacts of each client while offering the most flexibility to incorporate factors required in measuring a portfolio's tax alpha.

Meeting regulatory and industry standards is a requirement for any industry-wide after-tax methodology. Among the after-tax benchmark options presented here, only the shadow benchmark and after-tax return version of standard indices are recognized by current industry standards. Between these two, the shadow benchmark is the only one that reflects each client's tax circumstances by incorporating capital flows, cost basis, and tax rates. This is a critically important feature and the most important of the guiding principles. In addition to the client-specific tax rates, the inception date (which determines the market conditions the portfolio will experience), the cost basis (the starting point of measuring the tax impact), and the client-specific capital flows are the determining factors of tax impact of the portfolio. The path-dependency determined by the inception date, cost basis, and capital flows make each portfolio unique and requires a benchmark that matches those features in order to fairly measure and evaluate its performance.

The shadow benchmark is also the only option that adheres to each of the guiding principles established. This leads to selecting a shadow benchmark as the preferred choice as an after-tax benchmark, as it most closely mimics the client portfolio from a tax perspective and provides the fairest assessment of tax alpha. The chart below (Exhibit 1) identifies the guiding principles that each of the after-tax benchmark options meets:

Exhibit 1

After-Tax Benchmark Approach Comparison

Guiding Principle	Shadow Benchmark	Shadow Benchmark	Event-Based Approach	Adjustment Methodology
Meet regulatory and industry standards	✓	✓		
Produce a benchmark result that is tailored to the investment strategy and the individual investor's capital flows, cost basis, and tax rates	✓			
Fairly and objectively evaluate how a manager adds value from an after-tax perspective	✓			✓
Utilizes the same underlying index as the pre-tax benchmark	✓	✓		✓
Balance complexity and technical accuracy (with reasonable assumptions) to implement and scale across product lines	✓	✓	✓	✓
Be transparent, explainable, and verifiable to external parties, including clients	✓	✓		

II. BUILDING A SHADOW BENCHMARK

A. Shadow Benchmark Foundation

When building a shadow benchmark, firms must determine if constituent-level data is needed for the shadow benchmark or if total-level data will suffice. Calculating a shadow benchmark at a constituent level is a very complex, onerous, and potentially cost-prohibitive exercise that could be challenging for firms to implement. It requires maintaining market value, cost, and tax lots at the security level. For example, if a portfolio was benchmarked to the S&P 500 Index and had twenty lots at the time of funding, this would require creating 10,000 lots in the shadow benchmark. Each additional cash contribution or reinvestment of proceeds post inception creates an additional five hundred lots to track. It also requires capturing activity of the pre-tax market index, such as capital appreciation, income, rebalancing, and reconstitution

From an after-tax return perspective, the benefit of calculating the shadow benchmark at a constituent level compared to calculating at a total level may lie in its level of accuracy. For example, say an index had to be rebalanced due to a position being dropped at a loss and the proceeds reinvested in the index, while all the other positions in the index were positive, resulting in a positive pre-tax index return. This would result in an after-tax gain to the shadow benchmark. Alternatively, calculating the shadow benchmark at the total level relies on using turnover to capture rebalancing of the market index, which in this case would treat this event as a realized gain, creating an after-tax loss. Although this example may rarely occur, total-level data is sufficient in most cases and strikes the correct balance between complexity, accuracy, and scalability, one of the key guiding principles.

When deciding to construct the shadow benchmark at the total level, firms must determine whether to use a market index or a proxy, such as a mutual fund or ETF. Various considerations should be taken into account when weighing each option. For market indices, some of these may include:

- Index licensing agreements or data required to construct the shadow benchmark.
- Costs associated with the data required to construct the shadow benchmark.
- Whether all the data necessary to construct the shadow benchmark is published or readily available when needed. In cases where data elements are not available (e.g., price-only returns or turnover), firms should look for an appropriate proxy such as a mutual fund or ETF indexed to the same benchmark.

For mutual funds or ETFs, some of these considerations may include:

- Is there an available option that correlates to the investment strategy of the portfolio that might also be impacted by client restrictions and customizations?
- Are there any fees, investor capital flows, position limits, etc., embedded in these securities that are material enough to impact the meaningfulness of tax alpha?
- ETF's do not typically distribute capital gains, unlike the portfolio.

Recommendation: To ensure that tax alpha is a true measure of the portfolio manager's tax management skill, the same pre-tax benchmark should be used for the after-tax shadow benchmark calculation as mentioned above. If given the option between a market index and a mutual fund or ETF (assuming they all align with the portfolio's strategy), a market index is recommended.

With regard to the delineation of qualified and non-qualified income, it is recommended to use index data. If index data is not available, client data should be used as an alternative.

Once the decision is made regarding whether to use a market index or a mutual fund/ETF, the next step in the process is determining the methodology for applying this information to the shadow benchmark. This is covered in Sections C through E below.

B. Shadow Benchmark Events and Characteristics

When determining how to construct a shadow benchmark, one must consider events that occur in the client portfolio and assess whether they should be reflected in the benchmark. If the event is to be reflected in the benchmark, then one must determine how it is incorporated. The factors identified below impact a client's after-tax return and, therefore, should be captured in the shadow benchmark. They represent the client's actual cash flow activity, tax rates, and an estimate of income and trading activity within the index to which the portfolio is benchmarked.

- Capital Inflows and Outflows
- Capital Gains and Losses from Outflows (Short-Term and Long-Term)
- Rebalancing Impacts of In-kind Flows
- Benchmark Income (Qualified and Non-Qualified)
- Benchmark Capital Gain/Loss Realization/Turnover
- Federal Tax Rates (anticipated client rates or maximum federal rates)[ii]

Each of these events and characteristics, and how they are incorporated into the shadow benchmark, is addressed in the Shadow Benchmark Construction section below.

C. Shadow Benchmark Construction

1. Inception Date

One of the first items to consider when constructing the shadow benchmark is the inception date, as this will determine when the performance and tax-alpha clock starts. The inception date of the after-tax benchmark should match the account's inception date for the pre-tax benchmark. Because gains and losses can be incurred when incepting a portfolio

[ii]The USIPC After-Tax Performance Standards require that after-tax returns consistently utilize either the anticipated client tax rates or the maximum federal (or federal/state/local/city) tax rate(s) applicable to each client over time. Client-anticipated tax rates are preferred where possible rather than the maximum federal tax rates. The application of Alternative Minimum Tax (AMT), as well as state and local income taxes, is not recommended due to the added complexity and adverse impact on the ability to implement the model at scale. However, it is assumed that the same tax rates that apply to the portfolio will also be applied to the shadow benchmark, regardless of the rates that a firm chooses to use.

with in-kind securities, determining the inception date impacts the gains and losses that are reflected in the shadow benchmark. Firms may also choose to report performance using alternate inception dates to capture gains/losses from initial in-kind rebalancing.

2. Tax Lots

At inception, the cost basis of the shadow benchmark is set to match the cost basis of the portfolio. Matching the cost basis of the shadow benchmark with the cost basis of the portfolio ensures that both the shadow benchmark and the client portfolio start with the same beginning gain/loss. Replicating the portfolio's cost basis in the shadow benchmark can be achieved in various ways. Because short-term and long-term tax impacts are taxed at different rates, it is necessary to distinguish between short-term and long-term gains/losses in the shadow benchmark. Ideally, each tax lot within the client portfolio can be tracked based on the effective trade date of each capital flow to determine when it moves from short-term to long-term. These tax lots are then matched with corresponding tax lots in the shadow benchmark.

For simplicity in implementation (and explanation in this paper), firms could choose to create twelve[iii] monthly short-term tax lot buckets and one long-term bucket. This is consistent with the approach described in the March 2019 Parametric Portfolio Associates paper (Parametric Portfolio Associates 2019). Twelve monthly short-term tax lots are used rather than tracking daily tax lots because tracking daily lots dramatically increases the number of data points, adding to the complexity of the shadow benchmark. Long-term gains/losses are all placed in a single long-term tax lot bucket of gains/losses; these gains/losses are associated with securities held for one year or longer and are taxed at long-term tax rates. Firms could employ alternative methods for tracking the movement of tax lots from short-term to long-term. The key is to ensure that the functionality exists to monitor the progression of short- to long-term positions.

When the shadow benchmark is calculated at a total level, the benchmark will track net gains/losses on a total basis. As a result, the cost basis and, therefore, the net gains/losses for the twelve short-term and one long-term buckets will be either a total net gain or loss, but not both.

3. Initial Funding and Transition

A defining characteristic of a shadow benchmark is that it incorporates client capital flows. As a result, how the portfolio is funded, either with cash, in-kind securities, or a combination of both, must be evaluated to determine how these capital flows are incorporated into the shadow benchmark.

[iii] If needed, firms should consider having the flexibility to add additional tax lot buckets to accommodate potential future changes in the tax code.

For portfolios incepted with cash, the beginning market value and cost of the shadow benchmark are set to the value of the cash contribution in the first short-term tax lot bucket (i.e., no beginning gain/loss). For in-kind security contributions, the market value and cost are assigned to the respective short- and long-term buckets of the shadow benchmark based on their respective purchase dates. This aligns the shadow benchmark and the client portfolio with the same beginning gain/loss position associated with the security in-kind contributions.

Because in-kind contributions often require rebalancing to the target portfolio, any gains or losses realized due to the rebalance are incorporated into the shadow benchmark. How the net gains are incorporated into the shadow benchmark depends on if the transition is treated as an opportunity to add tax alpha. If the net gains associated with the initial transition are incorporated into the shadow benchmark exactly as they occur in the portfolio, this matches the inception gain/loss of the shadow benchmark with the portfolio, and the gains/losses that occur during the transition are not attributed to tax alpha. However, if the initial transition is viewed as an opportunity for the manager to add tax alpha, the net gains associated with the initial in-kind rebalancing are incorporated into the shadow benchmark in the same manner as net gains associated with routine cash or in-kind security withdrawals addressed in Section 4 below[iv]. This treats the net gain realized in the shadow benchmark differently from the portfolio, and the difference contributes to tax alpha.

4. Capital Flow Treatment and Cost Basis Adjustments

Routine contributions of cash and/or securities are handled the same as the initial funding and are assigned to the respective short- and long-term tax lot buckets of the shadow benchmark. Withdrawals, both cash and/or in-kind, are treated differently. Because a shadow benchmark is a passive representation of the client portfolio, this is achieved by proportionately allocating withdrawals across all tax lots. This differs from how the investment manager executes tax-lot-specific selection/harvesting in the client portfolio. The market value and cost basis of the shadow benchmark are reduced proportionately across each tax lot bucket based on the value of the withdrawal as a percentage of the total value of the shadow benchmark. This results in realized gains and losses from cash outflows and unrealized gains and losses from security outflows being applied proportionately to all short- and long-term tax lot buckets. The difference between the gains/losses realized from proportionately allocating across all tax lot buckets in the shadow benchmark and the actual gains/losses realized by the portfolio contributes to tax alpha.

In-kind contributions and withdrawals often require portfolio rebalancing; any realized gains and losses incurred from rebalancing are incorporated into the shadow benchmark in

[iv] The proportionate allocation of the market value and cost of the rebalance relative to the market value and cost of the in-kind is consistent with the proportionate allocation of cash and security withdrawals addressed in the next section of this paper.

in the same manner as the initial transition. If the flow is considered a tax alpha opportunity, the gains and losses associated with the rebalance are incorporated into the shadow benchmark by proportionately allocating the market value and cost of the rebalance relative to the market value and cost of the security in-kind flow, respectively. Incorporating the gains and losses by adjusting the market value and cost lots of the shadow benchmark not only incorporates the gains/losses incurred from the rebalancing, but also correctly adjusts the market value and cost buckets of the shadow benchmark to reflect the sale of securities across the various tax lot buckets and the reinvestment of these proceeds into the first short-term bucket. This treats the net gain realized in the shadow benchmark differently from the portfolio, and the difference contributes to tax alpha. If the flow is not considered a tax alpha opportunity, and the gains/losses that occur during the rebalance do not contribute to tax alpha, the net gains associated with the cash flow are incorporated into the shadow benchmark exactly as they occur in the portfolio, matching the gain/loss of the shadow benchmark with the portfolio.

D. Shadow Benchmark Maintenance

1. Market Adjustments

Routine shadow benchmark maintenance is typically performed monthly (Exhibit 2). To adjust the shadow benchmark for monthly changes due to index movement, the market value of the shadow benchmark is updated based on the price-only return of the benchmark index. Any updated unrealized gains/losses are determined from the value derived from applying the price-only return of the index to the shadow benchmark.

2. Income Return

Income for the period is derived from the difference between the benchmark total return and the price-only return, and applying this to the value of the shadow benchmark. The allocation of the income into qualified and non-qualified income is based on the index or, if not available, the client portfolio. Income is reinvested into the first short-term tax lot bucket.

3. Turnover

Income If a market index or mutual fund is used as the underlying index in the construction of the shadow benchmark, turnover is applied to account for periodic benchmark rebalancing and reconstitution. Capital gains/losses are realized in the shadow benchmark and are determined by using turnover. These calculated capital gains/losses are allocated proportionately across all the tax lot buckets and taxed at the corresponding short-term and/or long-term tax rates. Proceeds from turnover are also calculated across each of the tax lot buckets based on the turnover rate. Similar to income, the sum of these net proceeds is reallocated and treated like a cash contribution in the current short-term tax lot bucket.

Please note, turnover is only applied if a market index or mutual fund is used as the underlying index in the construction of the shadow benchmark. An argument can be made that an ETF is the most tax-efficient investment alternative to a tax-managed strategy because it does not distribute capital gains. If a firm takes this view, it could apply ETF assumptions to a market index and not include turnover in the calculation of the shadow benchmark.

4. Tax Lot Matriculation

To account for the matriculation of gains and losses from short-term to long-term, each month the market value and cost basis in the twelve short-term tax lot buckets roll forward to the next bucket (Exhibit 3).

Exhibit 2

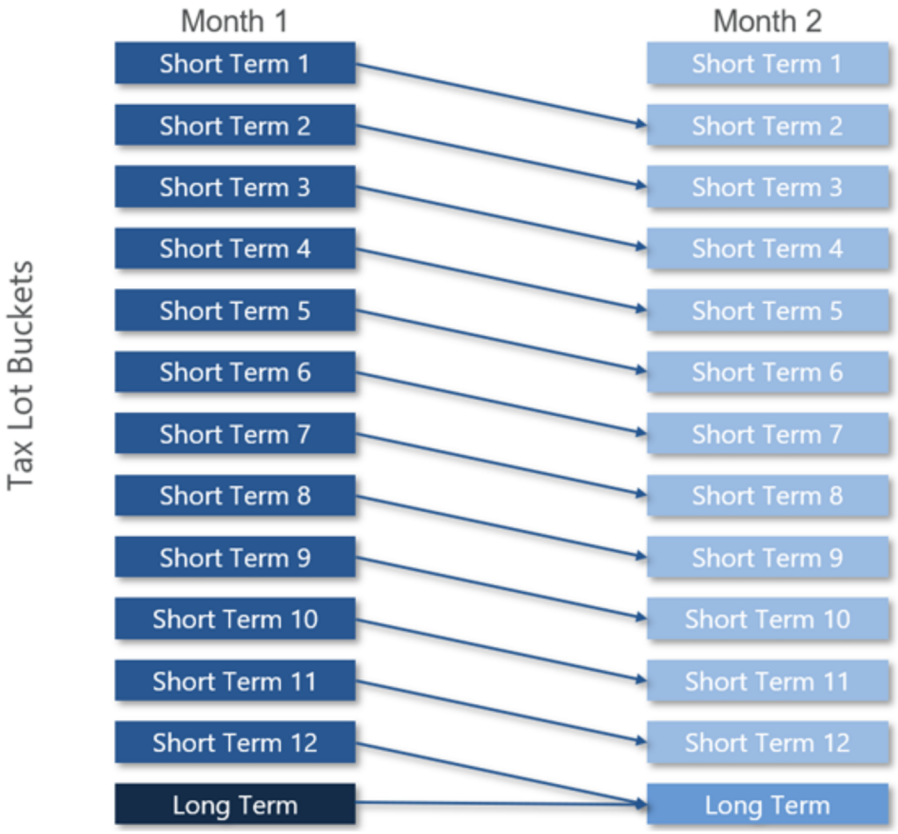
After-Tax Benchmark Approach Comparison

Event	Notes/Assumptions	Dollar Amount	Calculation
Total Beginning Market Value	No Capital Flows During the Period	$1,000,000	
Price Only Ending Market Value	Price Only Return is 5%	$1,050,000	Price Only Return * Total Beginning Market Value
Income Earned	Total Gross Return is 6%	$10,000	(Total Gross Return - Price Only Return) * Average Investment†
Qualified Income Earned	% of Qualified Income is 90%	$9,000	Income Earned * % of Qualified Income
Non-Qualified Income Earned	% of Non-Qualified Income is 10%	$1,000	Income Earned * % of Non-Qualified Income
Total Ending Market Value		$1,060,000	Price Only Ending Market Value + Income Earned
Turnover Proceeds	Turnover Ratio for Period is 8%	$82,000	Turnover Ratio * Average of Total Beginning Market and Price Only Ending Market Value
Turnover Gain/Loss	Unrealized Gain/Loss at Start of Period is $0	$4,000	Turnover Ratio * Average of Gain/Loss from Outflows and Unrealized Gain/Loss at Start & End of Period

†The use of Average Investment in the Income Earned calculation reflects what an investor would have earned based on the assumption of day-weighting capital flows received at the start of the period.

Exhibit 3

Tax Lot Matriculation



E. Tax Rates

The USIPC After-Tax Performance Standards require that after-tax returns consistently utilize either the anticipated client tax rates or the maximum federal (or federal/state/local/city) tax rate(s) applicable to each client over time. Our recommendation is to apply the client-anticipated tax rates where possible rather than the maximum federal tax rates, since this is consistent with the tax rates used for the portfolio. These anticipated tax rates should apply to the different types of income (e.g., ordinary income, dividend income, short-term capital gains/losses, long-term capital gains/losses, etc.), be established at the beginning of the year, and maintained throughout the year.

Application of the Alternative Minimum Tax (AMT), state, and local income tax is not recommended due to the added complexity and adverse impact on the ability to implement the model at scale. Based on the guiding principles of transparency and balancing complexity with the ability to implement and scale, disclosures for this exclusion should be made. However, it is assumed that the same tax rates that apply to the portfolio will also be applied to the shadow benchmark, regardless of the rates that a firm chooses to use.

F. Calculation Methodology

The USIPC After-Tax Performance Standards require that firms utilize a realized basis pre-liquidation calculation methodology that is also a time-weighted rate of return (TWRR). The TWRR calculation removes the effects of capital flows, allowing for a focused measurement of portfolio manager skill in generating tax alpha as well as comparison among different managers. From the review conducted of the USIPC After-Tax Performance Standards, it was determined that there are two recommended approaches to calculating pre-liquidation after-tax returns. These are referred to as the Modified Dietz and the Adjusted Pre-Tax Return, the latter being an equivalent expression of the Modified Dietz calculation. In both approaches, the after-tax impacts that are realized during the measurement period are incorporated, in the case of gains to the portfolio. Similarly, after-tax impacts resulting from losses that offset gains realized during the measurement period would be added back to the calculation, thereby increasing the after-tax return. These realized taxes are equal to (realized gains/losses x corresponding client capital gains "anticipated tax rates") + (taxable interest and dividend income x corresponding client income "anticipated tax rates"). The realized gains/losses are delineated by short- and long-term and interest and dividend income is delineated by ordinary income and non-qualified & qualified dividends. (CFA Institute, 2011)

Please note: the Modified Dietz method is commonly referred to as an approximate Time Weighted Rate of Return when calculating monthly returns. However, Modified Dietz can also be applied to daily calculations. The recommended calculation periodicity is daily, which requires that all necessary data be available daily. If calculating monthly returns, fair value prices and other components included in the formulas below need to be available on the day or day(s) of any large external capital flows. Returns for partial month periods between any monthly cash flows are calculated and geometrically linked to determine the full month's return.

Below are the formulas for Modified Dietz and Adjusted Pre-Tax Return and a list of where they can and can't be used for shadow benchmark calculation.

$$\textbf{\textit{Modified Dietz After-Tax Return}} = \frac{\text{(Ending Value – Beginning Value – Net Capital Flows – Realized Taxes)}}{\text{(Beginning Value + Weighted Capital Flows)}}$$

Acceptable Usage:

- Client capital flows
- After Tax impact from changes in accruals
- After Tax impact from changes in amortization/accretion
- Client-specific federal tax rates
- Short- and long-term capital gains and losses
- Dividends, income
- Turnover
- Shadow benchmark: market index, mutual funds/ETFs

$$\textbf{\textit{Adjusted Pre-Tax Return}} = \text{Pre-Tax Return} - \frac{\text{Realized Taxes}}{\text{(Beginning Value + Weighted Capital Flows)}}$$

Acceptable Usage:

- After Tax impact from changes in accruals
- After Tax impact from changes in amortization/accretion
- Client-specific federal tax rates
- Short- and long-term capital gains and losses
- Dividends, income
- Turnover
- Shadow benchmark: market index, mutual funds/ETFs

Prohibited Usage: Pre-tax returns cannot be used as-is if calculating monthly returns with day-weighting impacts of client capital flows.

III. CONCLUSION

The shadow benchmark approach presented above, while somewhat complex, achieves the desired outcomes and meets the guiding principles. The methodology addresses the common activities within a portfolio and applies rational assumptions. While valid arguments can be made for alternate approaches and assumptions, the hope is that the methodology presented in this paper can serve as a starting point for conversations that may lead to an industry standard. By standardizing the methodology for calculating after-tax benchmarks, investors can fairly compare asset managers, and asset managers can compete on a level playing field. Feedback is critical. Any comments or questions can be directed to **aftertax@meradia.com**.

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Appendix 1 – Fix Income Considerations

Calculating fixed income specific tax-impacts for income realization in the event a pre-tax income return of the index (total gross return minus price-only return) is not available.

Income realization (accruals)

If the necessary data to derive an income return for fixed income benchmarks is not available and must be derived from actual accruals, the USIPC requires that taxes calculated on interest be recognized on an accrual basis. This means that after-tax impacts should be calculated in the period they are earned and not when they are received. For the purposes of calculations, the change in accrued interest can be obtained in aggregate at a total portfolio level or derived from the underlying holdings data. Ordinary income tax rates are applied to the change in accrued interest.

Amortization of premiums and accretion discount determination

Although not required, the USIPC recommends that accrued interest include the amortization of premiums and the accretion of discounts on all bonds if required by the client's tax situation. Amortization reduces a bond's cost basis for the premium paid over the life of the bond. This reduction in cost is tax-deductible for taxable bonds and helps to offset the tax liability resulting from the change in accrued interest. Accretion refers to the increase in a bond's cost basis over time since it is purchased at a discount. From an after-tax impact perspective, accretion is treated as taxable interest income, thereby increasing the tax liability. Since the cost basis is increased over time, a benefit of a discounted bond is that its capital gain is reduced or eliminated upon the sale or maturity of the bond.

Accretion of discounts can be categorized as either Original Issue Discount (OID) or market discount. Both refer to a bond purchased at a discount and the amounts are the difference of what an investor paid and the bond's maturity value. OID refers to the discount offered when the bond is originally issued, and market discount refers to bonds purchased at a discount on the secondary market. A bond is said to have been sold at a market discount when its value falls below par after it is originally issued, usually caused by an increase in interest rates. While OID must be accreted, the investor has the option to accrete or not for market discount. For a market discount, different taxation rules apply in terms of treating gains as ordinary income or capital gains when a bond is sold prior to maturity. Bonds with OID or market discount deemed to be "de minimis", meaning below a certain threshold, are exempt from the accretion rules. For this test, a de minimis discount is one that is less than ¼ of 1% of the bond's par value, multiplied by the number of years until the bond matures. This rule applies to both taxable and tax-exempt bonds.

Appendix 2 – Frequently Asked Questions

Q: Our strategy employs short positions. How are they represented in the shadow benchmark?

A: For accurate assessment of tax alpha, it is important that the benchmark used for pre-tax purposes is also used as the base for the after-tax shadow benchmark. If short positions are accounted for in the pre-tax benchmark, they should similarly be reflected in the after-tax benchmark. In our experience, long-short strategies are typically benchmarked to a long-only benchmark, so no special accommodation is necessary in the after-tax benchmark.

Q: We often have clients who prohibit us from owning certain stocks. How do we account for these excluded securities in the shadow benchmark?

A: For accurate assessment of tax alpha, it is important that the benchmark used for pre-tax purposes is also used as the base for the after-tax shadow benchmark. If the pre-tax benchmark excludes a particular security, the same should be done for the after-tax benchmark. Because the shadow benchmark does not require constituent-level data or tracking, whatever benchmark is used on the pre-tax side can be used as the base for the after-tax benchmark. In most cases, no changes are made to the pre-tax benchmark and, therefore, no changes are necessary to the after-tax benchmark.



Jonathan Boersma, CFA
GIPS and Performance Regulation



Brad Waitsman, CFA
Performance and Attribution



Eric Linker, CFA
Performance and Attribution

Meradia
119 N High St, West Chester, PA 19380
610-730-7787

Meradia Canada
800 Rue du Square-Victoria, Unite 4700, Montreal, QC H3C 0B4
438-817-5005

info@meradia.com
Meradia.com

Meradia