



**Parametric™**

Leaders in Structured Portfolio Management

## AFTER-TAX RETURNS: Methodology for Computing

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Parametric reports pre-tax and after-tax returns of both portfolios and their benchmarks. This document describes our performance-reporting methodology.<sup>1</sup> CFA Institute has not been involved with the preparation or review of these reports. In this paper, we identify the risk and return characteristics associated with frontier markets, highlight recent trends observed in this space, and explore associated investment opportunities. We also outline the benefits of incorporating this asset class into a diversified investment strategy, while underscoring the importance of manager and trading expertise in the operational mechanics of these countries. ▶▶

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## ►► PRE-TAX PERFORMANCE

### Portfolio

Pre-tax performance for the portfolio is computed using a standard time-weighted total return methodology. We compute returns daily and link them geometrically to arrive at monthly total returns for the portfolio. Each asset flow (contribution or withdrawal) is thus weighted by the amount of time invested. This fairly compares the performance of the portfolio when there are asset flows to its benchmark.

### Benchmark

Pre-tax total returns for standard benchmarks are obtained from reliable published sources.<sup>2</sup> For non-conventional benchmarks with un-published returns, we maintain the benchmarks as portfolios in internal systems and update them for regular corporate actions and M&A activities when appropriate. We compute pre-tax total returns for the benchmarks as we do for portfolios, using the daily linked time-weighted method.

## ►► AFTER-TAX PERFORMANCE

### Portfolio

For after-tax performance reporting we use the method specified in the After-Tax Provisions of the CFA Institute Standards. These report “pre-liquidation” returns -- taxes are computed only on transactions that create taxable events, and a future tax liability may still exist when there is an unrealized gain position.

The after-tax return is calculated as follows:

$$\text{Pre-Liquidation After-Tax Return} = \text{Before-Tax Return} - \frac{\text{Realized Taxes}}{\text{Weighted Market Value}}$$

In this expression,

$$\text{Weighted Market Value} = \text{Start Value} + \text{Sum of Day - Weighted Asset Flows}$$

$$\text{Realized Taxes} = (\text{Realized Gains}) * (\text{Capital Gains Tax Rate}) + (\text{Taxable Interest and Dividend Income}) * (\text{Income Tax Rate})$$

For the anticipated tax rate, we may apply the maximum federal tax rates in effect at the time.<sup>3</sup> If the investor or advisor requests otherwise, we apply the rates they specify.

### Benchmark

After-tax benchmark performance computation is more complex than pre-tax and does require some approximations. After-tax benchmark computations have not yet been

<sup>1</sup>Parametric has long been a leader in after-tax performance reporting and benchmarking. For additional background, see our published work on the subject:

David M. Stein, Measuring and Evaluating Portfolio Performance After Taxes, *Journal of Portfolio Management*, Winter 1998, Vol. 24 No. 2.

David M. Stein, Brian D. Langstraat and Premkumar Narasimhan, Reporting After-Tax Returns: A Pragmatic Approach, *Journal of Private Portfolio Management*, Spring 1999, Vol. 1 No. 4.

David M. Stein, Reporting After-Tax Returns: Errata, Parametric Portfolio Associates Research Report, unpublished.

<sup>2</sup>We use returns published by MSCI, Research Affiliates, Russell, Standard and Poors, and Bloomberg for standard benchmarks.

<sup>3</sup>In 2010, this rate was 35% on net short-term realized capital gains and dividend income, and 15% on long-term capital gains.

standardized by the industry, although CFA Institute has made some recommendations.

We employ the concept of a “shadow benchmark,” which approximates the investor’s return from an investment in a passive vehicle such as a passive mutual fund or an exchange traded fund indexed to the target benchmark. It shadows the investor’s actual investment flows, tax rates and taxes generated by the investment over time. With these, we can calculate after-tax performance in the same manner that we do for the portfolio. Since each account may experience different taxable events, a unique shadow benchmark is maintained for each account.

A more detailed description of the shadow benchmark is shown in Appendix 1.

#### ►► APPENDIX 1: SHADOW BENCHMARK

The shadow benchmark can be thought of as a simulated account which shadows the actual account’s investment flows, returns, and market value over time. As with all simulations, it makes some simplifying assumptions. It models the evolution of a single-security investment, but distinguishes between short-term and long-term tax lots. We model thirteen tax lots, twelve short-term (ages 0-11 months), and one long-term (age over one year).

Once we have the capital gains and dividends for the shadow investment, we can calculate after-tax performance in the same manner that we do for the portfolio. The following sections describe how we compute the shadow benchmark’s capital gains and dividends.

#### The Initial Cost-Basis and Market Value of the Shadow Benchmark

At account inception, we assign the shadow benchmark the same market value and cost basis as the actual portfolio. For a portfolio incepted with cash, the shadow benchmark’s cost basis and market value will be the same, and will equal the inception cash amount. For a portfolio incepted with in-kind securities, the shadow benchmark is assigned the same cost basis and market value as those securities.<sup>4</sup> Then the initial portfolio is re-balanced to its designated benchmark and, in doing so, may incur capital gains and losses (see discussion of initial transition on next page).

#### Initial Transition of In-Kind Securities in the Shadow Benchmark

When a portfolio is incepted with in-kind securities, gains may be realized when transitioning the assets in line with the selected benchmark. In many cases we will transition the assets over time. This has the effect of reducing the initial tax cost but leads to higher tracking error to the benchmark. Upon inception, the shadow benchmark will experience the same gains and losses incurred by the portfolio. However, by construction it will show zero tracking error to the benchmark. This is a conservative approach because while

<sup>4</sup> Note that this reflects the cost basis of the initial in-kind portfolio, prior to Parametric’s re-balance to a benchmark-optimized portfolio.

both the portfolio and shadow benchmark show the same tax cost upon the initial transition trade; the portfolio will show a higher tracking error to the benchmark compared to the shadow benchmark.

### Ongoing Simulation of the Shadow Benchmark

We update the cost basis and market value of each tax lot on a monthly basis using the steps outlined below :

1. We calculate a new market value for the shadow benchmark based on the pre-tax price return of the actual benchmark.
2. We realize capital gains in the shadow benchmark based on turnover estimates for the actual benchmark.
3. We advance the age of each tax lot by one month after adjustment of the cost basis and market value due to asset flows.
4. We create a new tax lot to account for the re-investment of after-tax dividends and sale proceeds.

### Ongoing Asset Flows in the Shadow Benchmark

When the account experiences an asset flow (contribution, redemption, transfer of securities in or out of the portfolio), a similar flow is applied to the shadow benchmark. Cash flows and security flows are treated differently.

When the account experiences a cash flow; the cost basis and market value of the simulated benchmark are adjusted by the value of the cash contribution or redemption. In the case of a cash contribution, we increase the market value and cost basis of the current month tax lot. In the case of cash redemption, a pro-rata sell of the shadow benchmark's tax lots is assumed. As a result, the simulated benchmark realizes gains proportionately across the lots as a percentage of the redemption. Security inflow and outflows are treated differently.

For security inflows, we assign the cost basis and market value to the existing simulated tax lots. We model the security outflow as a combination of a cash redemption and a cost-basis adjustment. When an asset is transferred out of the portfolio, the shadow benchmark will experience a pro-rata redemption which matches the market value of the asset flow. The redemption results in the appropriate change in market value and any tax liability associated with the pro-rata liquidation of securities. To reflect the cost basis/unrealized gain transferred out of the portfolio, we reduce the amount of the unrealized gain (by increasing the cost basis) in the shadow benchmark by the amount of gains transferred out of the portfolio. This has the effect of decreasing the embedded tax liability of the shadow benchmark by the same amount that is decreased in the portfolio. This approach captures the positive benefit of deferring taxes on the initial transfer

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<sup>5</sup> An in-kind transfer of securities into an existing portfolio typically requires a re-balance to the target benchmark. We assume that the investor transfers in securities that have appreciated over time and therefore any gains that are realized during the re-balance are due to the addition of the highly appreciated securities. Similar to the treatment of the inception of an in-kind security account, gains realized upon rebalance in the portfolio are also applied to the shadow benchmark.

without penalizing the anticipated after tax return of the benchmark in the future.

Often times, a portfolio rebalance is required when securities are transferred into or out of the portfolio. Upon rebalance, gains or losses may be realized in the portfolio. If net gains are realized, the cost basis and returns of the shadow benchmark are adjusted to reflect this.<sup>5</sup>

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#### ABOUT PARAMETRIC

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