

Parametric Portfolio Associates

Tax-Managed Core / Portfolio Management Overview

Parametric designs and implements separately managed tax-efficient passive portfolios. These portfolios are structured to provide investors with a pre-tax return comparable to their chosen benchmark while enhancing after-tax returns through active tax management.

We manage portfolios to a variety of S&P and Russell index benchmarks, as well as to benchmarks flexibly customized to investor needs.

We are fully invested and do not time the capital markets. We do not conduct fundamental stock research. We are indifferent to the choice of individual securities, and portfolio decisions are based on risk and tax management rather than an opinion on the prospects of any individual security.

Portfolios are managed on a team basis under the direction of the Chief Investment Officer and lead Portfolio Manager. The CIO also heads the design and implementation of our automated systems.

Building Portfolios

When a new investor enters our program, he specifies a target benchmark and a bound on “tracking drift” (tracking error) -- a statistical estimate of the distance of a portfolio from its benchmark. He can invest with either cash or an existing portfolio of securities, which for best results should be detailed at the tax lot level.

We build the initial portfolio so that it tracks its benchmark as tightly as possible and at the lowest tax cost possible. For portfolios starting with pre-existing holdings, there is generally a trade-off between tracking drift and tax cost, and this decision is made in consultation with the investor or his advisor.

Over time, investment flows, market movements, and benchmark reconstitution cause a portfolio’s exposures to drift from those of its benchmark. We monitor the tracking drift and rebalance the portfolio to ensure that this drift always remains within its specified tolerance.

Risk Control (Managing Tracking Drift)

In maintaining portfolios to investors’ tolerance for risk, our policy is the following:

- Control tracking error, but take into consideration the cost of doing so.
- Be wary of the mathematical predictions and avoid misusing them.

In practice, we monitor the estimated tracking error of our portfolios continuously. We use state-of-the-art multi-factor risk models from a number of sources (as well as using our own internally developed models), and crosscheck them¹. Generally, when we refer to a predicted tracking error of a portfolio, we use the Barra estimate.

In addition to monitoring and controlling tracking error, we control risks by insisting that portfolios are similar to their benchmarks in terms of fundamental factors such as cap-size distribution, book/price, dividend yield, beta, economic, and industry sectors; we also limit any security-specific exposures.

Portfolios are structured so that at all times they are broadly diversified and could remain in place for extremely long periods without active decision-making. The number of securities is determined by the benchmark, the asset size, the tracking tolerance, as well as transaction and custody charges. They can have anywhere from 100 (e.g. for an S&P100 mandate) to 500 securities (RU3000).

Managing the Portfolio over Time

Every day we gather market information such as stock prices, corporate actions and benchmark constituents. We monitor cash contributions and withdrawals. We evaluate each portfolio's risk exposures daily.

If necessary and when appropriate, we *re-balance* the portfolio. In this re-balancing, we raise or invest any cash², and attempt to harvest losses. (Harvesting guidelines are discussed in more detail below). We evaluate the space of possible new portfolios, and choose the one that produces the largest tax benefit – or smallest tax cost – while keeping the tracking drift within its bound. We insist that trading costs be low, and ensure that any tax benefit out-weighs the trading cost by a substantial amount.³

Here are events that cause us to evaluate a portfolio for re-balancing:

¹ We subscribe to third-party risk models provided by Barra, Vestek Systems, Salomon Brothers and others.

² A small amount of cash is left in the portfolio to allow for price movements between the time of placing the order and the market close.

³ Here is a simple model. Assume that the typical share price is \$50, and that the typical bid-ask spread is an eighth (\$0.125) per share. If we sell \$100 (2 shares) of one stock and buy \$100 (2 shares) of another stock, the one-way turnover is \$100. The trading cost is \$0.50 (4 shares times \$0.125) plus any transaction fee, custodial cost, and commission.

- *Cash*. If cash balances are significant (greater than 1% of the portfolio⁴); if cash is required to be withdrawn.
- *Unrealized Losses*. If the total unrealized loss is a large-enough percentage of the portfolio, or if any individual security has a large-enough capital loss.
- *Tracking Error*. If the tracking error or another measure of risk that we monitor is beyond its target bound. Market movement or benchmark re-constitution may cause this to happen.
- *Time*. If a long-enough period has passed since the last re-balance.

Loss Harvesting

Our loss-harvesting process attempts to realize capital losses in order to obtain an after-tax benefit for the investor. We are focused on this subject throughout the year. Our harvesting sells a basket of securities and replaces it with another basket so that the resulting *portfolio* satisfies its risk targets. During loss harvesting we keep all risk exposures in line, and balance the tax benefit against any increase in tracking very carefully.

We harvest losses in large securities in stages so as to avoid being out of any of these names.

We attempt to realize only those losses that are not negated by wash sales rules. Accordingly, we do not harvest losses if the security was bought within the past 31 days and we do not buy a security sold at a loss in the past 31 days. Of course, when there are large investor cash flows, we may not be able to avoid wash sales.

At certain times we inhibit harvesting on some securities when we might expect a bounce-back in price. Our proprietary quantitative models that make this determination are based on stock momentum, volatility and volume.

In all rebalancing we also take into account dividend taxation as an extra cost. We seek to avoid non-qualified dividends, and attempt to respect a 61-day holding period.

Portfolio Trading

Parametric's trading philosophy focuses on costs and risk control. Our preferred trading strategy is an "agency trade" with low commissions, executed via a broker or electronic crossing network. Much of our trading is done "market-on-close". When executing an order, which typically contains many securities, we strive to keep the order both dollar and sector neutral. We seek to minimize market impact, a primary contributor to trading

⁴ The exact percentage is subject to change.

costs and intra-day volatility. A pre-trade analysis identifies illiquid securities that need more careful execution. Our executions are analyzed by a third-party research firm and reviewed regularly; we monitor our trading performance and evaluate the performance of the brokers to ensure we receive “best execution.”

Automation, Technology, and Systems

Our investment process is implemented with a high degree of automation, thereby reducing manual errors. However, a portfolio manager does ratify final trades.

We have integrated our accounting systems, client databases, market databases and portfolio management engine into a powerful computer system. This system is developed and maintained internally. It allows us to re-balance, trade, reconcile and report very efficiently.

We have chosen to build our computational engine instead of leasing one, despite the higher cost. While there are some good third-part engines available, we have found that these tools (which are necessarily general-purpose) are not tuned well enough to our tax optimization needs; they do not provide us with our required degree of control over our problem specification, speed, nor are they able to integrate easily with our systems.

The mathematical problem that we formulate is an integer quadratic-programming optimization tailored to our needs. It includes, for example, the following capabilities:

- Flexible control over the buying and selling of individual tax lots
- An ability to integrate heuristics based on our extensive experience
- Control over the number and size of trades, and of tax loss realization

We do, however, use sophisticated mathematical subroutine libraries with the most current mathematical optimization capabilities. These are licensed from a large third party specialist, who provides these lower-level mathematical routines to many industries in addition to finance, requiring complex optimization.

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