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Leaders in Structured Portfolio Management

Assessing the Risks of a Yield-Tilted Equity Portfolio

Recently, investors have shown an increased preference towards income versus capital appreciation. One option to increase income is to favor dividend-paying stocks over non-dividend paying stocks within an index-based portfolio strategy known as yield tilting. For example, a yield-tilted portfolio can be constructed to deliver 1.5x or 2.0x the yield of the index. In other words, when the index yield is 2.0%, the 1.5x tilted portfolio seeks to deliver a yield of 3.0%. While this additional yield is attractive, it comes at a related cost. The process of tilting a portfolio toward dividend paying stocks introduces systematic risks relative to the target index.

In this paper we explore the risk characteristics of the yield-tilted portfolio. Specifically, we examine the historical tracking error of 1.5x and 2.0x yield-tilted portfolios versus a market cap-weighted index. In addition, we decompose the tracking error to uncover the persistent and dynamic biases resulting from this strategy. Finally, we examine the current risk characteristics of yield-tilted portfolios managed by Parametric. ▸▸

RESEARCH BRIEF
Summer 2011

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OBSERVATIONS

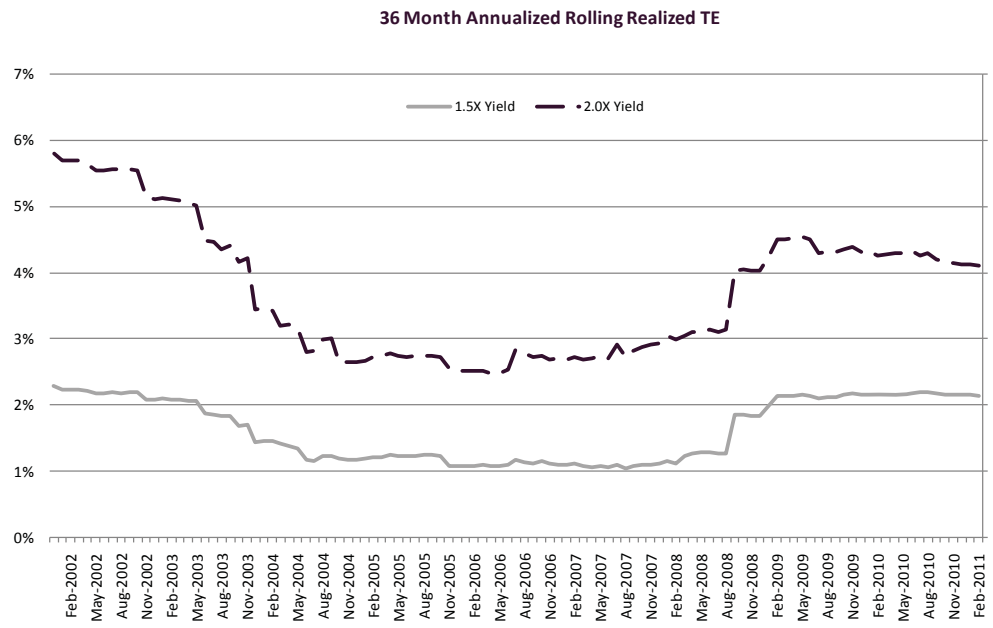
Through a monthly back test spanning 12 years, our results show that the 1.5x and 2.0x yield-tilted portfolios exhibit a realized tracking error of 1.0 - 2.0% and 2.5 - 6.0% respectively, when compared against the S&P 500 Index®. The tracking error varies over time and is higher during periods of high cross-sectional volatility.[1] Related to the tracking error, we find that the magnitude of the systematic biases varies over time as well. Some systematic biases, such as exposure to the financial sector, changed quite dramatically over the test period. During most of the period, the financial sector bias was positive. However, more recently, the bias has become negative. By contrast, the Barra Size factor bias of the dividend-tilted portfolios remained slightly negative and relatively consistent during the same period.

THE RESULTS

We used a 12-year history of the S&P 500 as our base index. To tilt the index towards yield, we used an optimizer and the Barra USE3L Risk Model to construct portfolios with a constant positive bias, or overweight, to the Barra Yield factor, while simultaneously working to minimize the tracking error. The portfolios were rebalanced monthly and the constant bias to this factor on average resulted in portfolios with yields of 1.5x and 2.0x the yield of the S&P 500.[2]

In Exhibit 1 we show the rolling 36-month annualized realized tracking error (standard deviation of excess returns) of the portfolios compared to the S&P 500. As expected, the more extreme the tilt, the higher the realized tracking error. The tracking error for the 1.5x yield portfolio is on average 1.60%, while the 2.0x portfolio shows an average closer to 3.7%. Tracking error increases substantially as we increase the yield tilt from 1.5x to 2.0x because the number of eligible securities is reduced substantially.

Exhibit 1:
Realized Tracking Error of the Yield-Tilted Portfolio Compared to the S&P 500



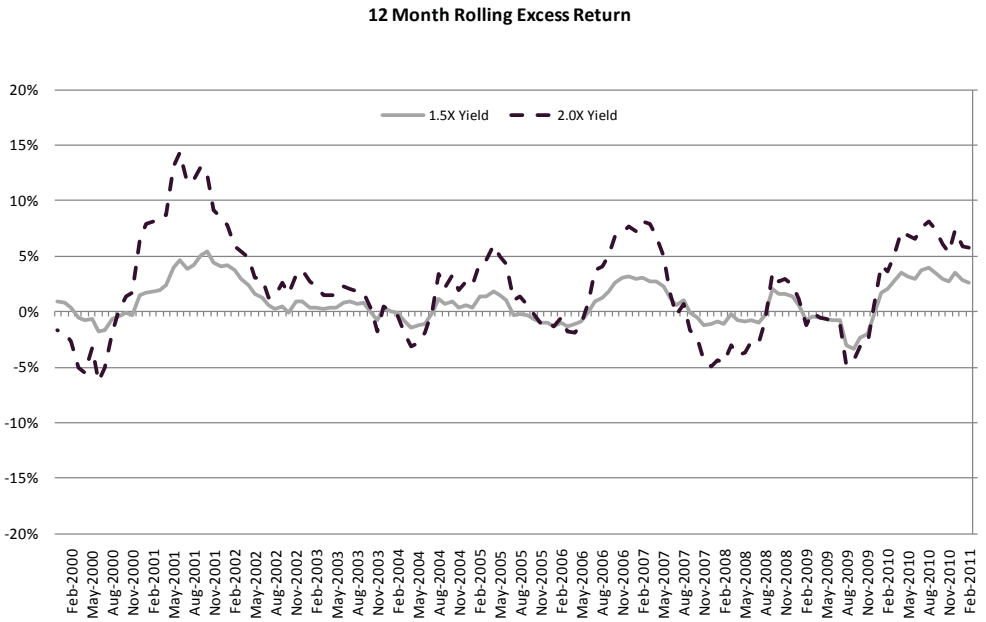
Source: Parametric, MSCI

[1] Cross-sectional volatility is a measure of security return dispersion. When securities returns are similar, cross-sectional volatility is low. When security returns differ, cross-sectional volatility is high.

[2] To facilitate our research, the optimizer was configured to seek a constant bias to the Barra Yield factor. The two test cases studied were a 0.5 and a 1.0 constant bias to this factor. The units of the exposures are standard deviations. The Barra Dividend Yield factor exposure is a standardized score of a combination of the firm's last four quarterly dividend payments and future dividend announcements. The actual yield multiple for each portfolio varied over time around 1.5x and 2.0x,and the actual average multiple for each case over the test period was 1.55x and 2.10x respectively.

The average number of securities in the 1.5x yield portfolio was 255, compared to 124 securities in the 2.0x yield portfolio. We also note that the tracking error varies during different market regimes. From the dataset, we see three distinct time periods: a period of high tracking error from 1999-2003, a period of low tracking error from 2003-2008, and a return to high tracking error from 2008-2011. The periods of high and low tracking error coincide with periods of high and low cross-sectional volatility in the market. During periods of low cross sectional volatility, the tracking error of the 2.0x tilt portfolio is about double that of the 1.5x tilt portfolio. However, during periods of high cross-sectional volatility, the gap increases to as high as 2.5 times that of the 1.5x tilt portfolio.

Exhibit 2: Rolling 12-Month Excess Total Returns of 1.5X and 2.0X Yield Strategies Relative to the S&P 500



Source: Parametric, MSCI

From a performance perspective Exhibit 2 shows that the strategy did well during the 2000-2001 bear market. It also did well from 2006-2007. The strategy underperformed during the global financial crisis of 2008 and outperformed during the recovery. To gain more insight into the strategy's excess return patterns, we examine the historical risk factor exposures of the portfolio.

SYSTEMATIC BIASES WITHIN THE YIELD-TITLED PORTFOLIO

The yield tilted portfolio is constructed using an optimizer, which is configured to minimize the predicted tracking error while maintaining a constant positive bias to the

Barra Yield factor. Selection of higher yielding securities results in systematic biases to certain risk factors. As of June 17, 2011, Parametric's composite of S&P 500 yield-tilted portfolios exhibits a negative bias to:

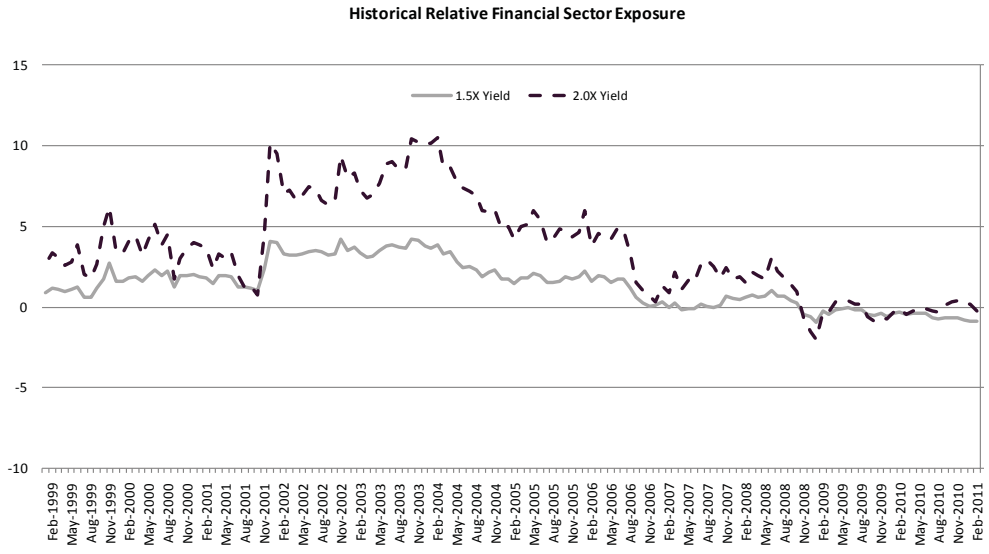
- The size, growth and volatility fundamental risk factors[3]
- The health, financial, transportation and technology sectors

and a positive bias to:

- The value and earnings yield fundamental factors
- The utilities, basic materials, industrials and telecommunications sectors

Our research shows that the systematic biases to these factors are dynamic. More recently, dividend portfolios exhibit a negative bias to financials, whereas during the study period the portfolio was typically overweight financials to varying degrees:

Exhibit 3:



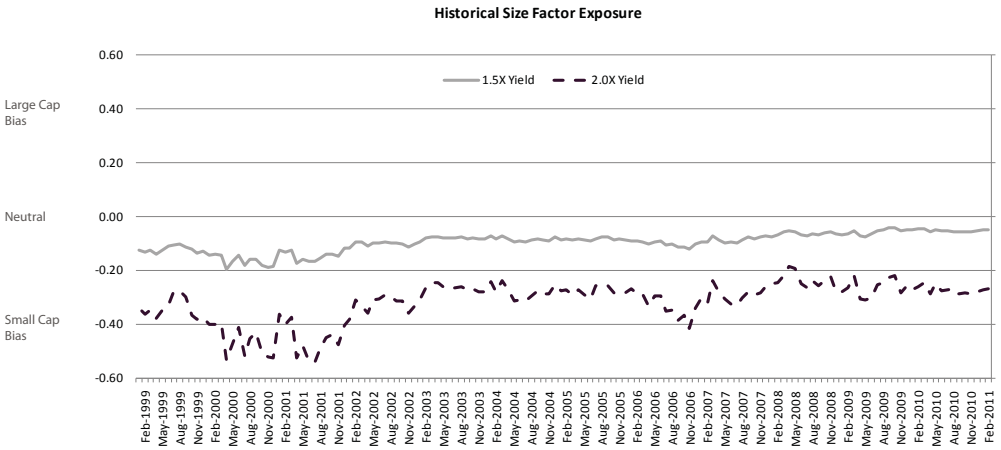
Source: Parametric, MSCI

From 2001-2004, the 1.5x yield-tilted portfolio showed a 4% overweight to financials, while the 2.0x yield portfolio showed an overweight as high as 10%. Starting in November 2008, the portfolios began to exhibit a negative bias to financial stocks.

[3] We examined the portfolios using the Barra USE3L risk model. The risk model is made up of industry and fundamental risk factors such as growth, value, size, volatility and momentum. For more information see the MSCI website at http://www.msci.com

The negative bias to financials coincides with the global financial crisis when many financial firms cut their dividends. In general, the larger the bias is to any given sector, the larger the expected tracking error will be. While the magnitude of the portfolio bias to financials varied over time, we find that the company size bias was relatively stable:

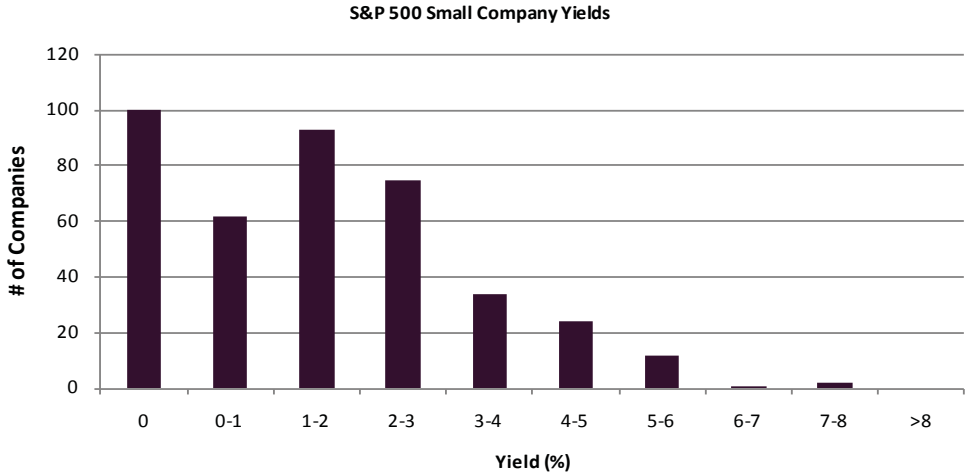
Exhibit 4:



Source: Parametric, MSCI

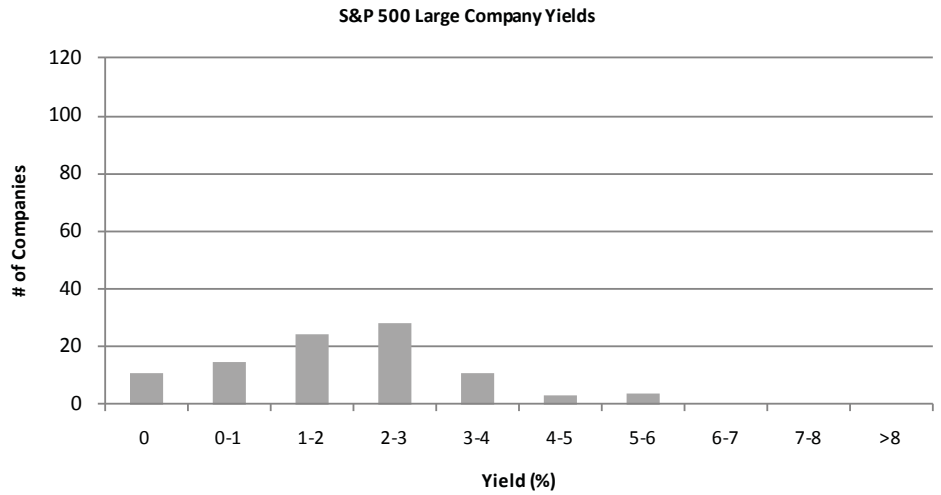
It is interesting to note that there are more high dividend-yield small companies than large companies:

Exhibit 5:



Source: Parametric, MSCI

Exhibit 6:



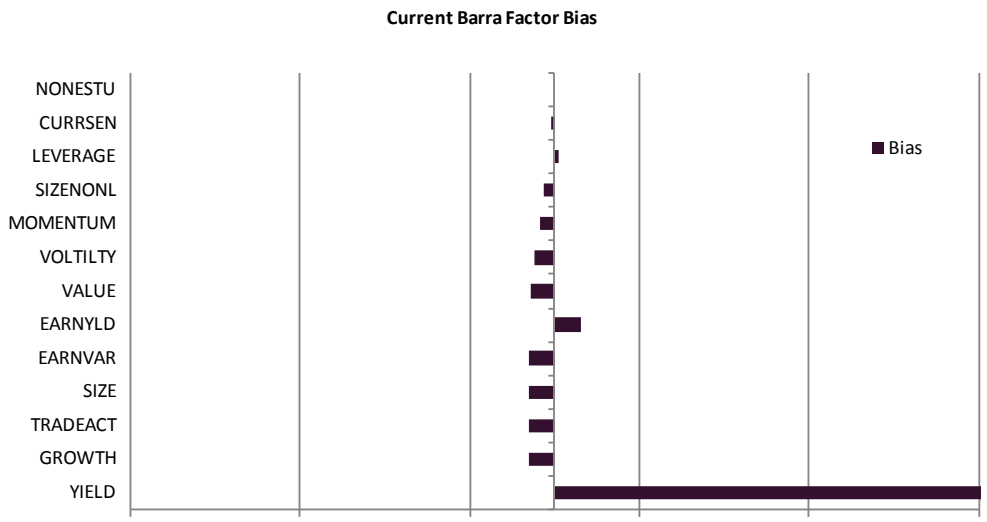
Source: Parametric, MSCI

Exhibit 5 and 6 show the frequency of dividend paying large and small companies in the S&P 500. Currently the index yield is 2%, so a 1.5x yield-tilted strategy would seek securities with yield greater than 3%. In the S&P 500 there are 71 small companies and only 18 large companies fitting this criterion. The larger high yield opportunity set in smaller companies combined with the objectives of higher yield and broad diversification result in portfolio biased slightly toward smaller companies.

IMPLEMENTING A YIELD-TILTED PORTFOLIO

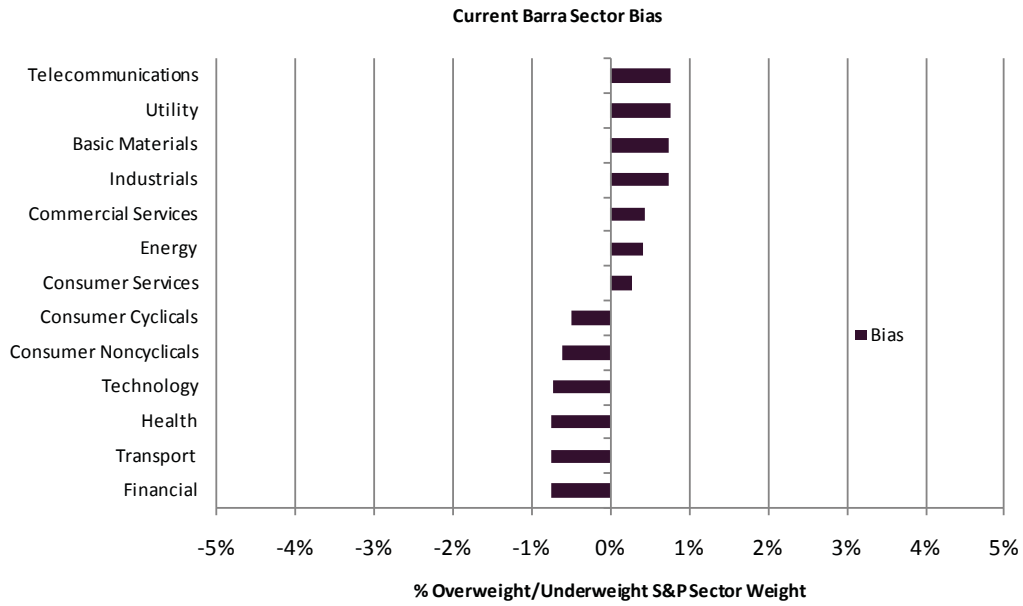
Parametric currently manages portfolios with a 1.5x yield tilt to the S&P 500. To construct these dividend-tilted portfolios, we use an optimizer and constrain the portfolio indicated dividend yield to 1.5x the benchmark value. We also constrain the stock-level, industry-level, sector-level and Barra risk factor biases in the portfolios. Exhibits 7 and 8 show the current factor and sector biases of a representative 1.5X dividend yield-tilted portfolio:

Exhibit 7:



Source: Parametric

Exhibit 8:



Source: Parametric

Given these biases, the current predicted tracking error of this portfolio is ~1.5%.

SUMMARY

Using an optimizer and a risk model we constructed dividend yield-tilted portfolios exhibiting a 1.5x and 2.0x yield compared to the S&P 500. Backtesting over this 12-year test period shows that these portfolios delivered excess yield over the benchmark and that they exhibit certain dynamic systematic biases, resulting in higher tracking error. The tracking error for these strategies ranged from 1.0-2.0% and 2.5-6.0% for the 1.5X and 2.0x yield-tilted portfolios. The tracking error varies depending on the degree of the yield tilt and the cross-sectional volatility of returns. Over the test period, we see that the the magnitude of systematic biases varied over time. For the 2.0x yield case, the financial sector bias ranged from +10% to neutral in more recent years. The portfolios also exhibited a small company bias which was relatively stable during the test period. Tilting towards dividends may lead to excess returns, but certainly creates active risk exposures.

ABOUT PARAMETRIC

Parametric is an industry-leading provider of structured portfolio management, headquartered in Seattle, Washington. Parametric and its affiliate, Parametric Risk Advisors, offer a variety of structured portfolio solutions, including customized core equity portfolios (U.S., Non-U.S., global), options strategies, and overlay portfolio management. Parametric is a majority-owned subsidiary of Eaton Vance (ticker: EV).

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