September 2014 Investment Publications Highlights

Growth/Value, Market Cap, and Momentum

Jun Wang, Robert Brooks, Xing Lu, and Hunter M. Holzhauer, *The Journal of Investing*, Spring 2014

Some researchers have questioned the ability to implement momentum strategies without substantially diminishing the related returns. The authors investigate this issue by using indexes to implement their style-based momentum strategy and conclude that a momentum style of investing can be implemented profitably.

Investors tend to diversify by investing in different styles, based on characteristics such as capitalization and valuation. Over long periods value is commonly believed to outperform growth, but over shorter periods growth and value are cyclical. Similarly, small caps are commonly held to outperform large caps over the long term, but this also varies through time. Large shifts in performance between size and/or valuation can adversely affect the returns of long-term portfolios heavily tilted toward one side. Momentum-style investing—buying recent winners and selling recent losers—has drawn substantial attention from investors as empirical research has provided evidence of profits for this strategy. However, questions remain regarding the practical aspects of implementation.

The authors conducted their analysis by constructing portfolios of indexes rather than individual stocks, where much research has been done. In this analysis, the momentum strategy is implemented using S&P style total return indexes: S&P 500, S&P 500 Pure Growth, S&P 500 Pure Value, S&P Mid Cap 400, S&P Mid Cap 400 Pure Growth, S&P Mid Cap 400 Pure Value, S&P Small Cap 600, S&P Small Cap 600 Pure Growth, and S&P Small Cap 600 Pure Value. The indexes were selected because they are widely known, less expensive to trade than individual stocks, do not suffer from the liquidity issues associated with many smaller stocks, and have exchange-traded funds available.

For this analysis, the winner and loser indexes were chosen based on the highest and lowest returns over the prior one, three, six, nine, or 12 months. The authors "bought" the winner index, "sold short" the loser index, and held the portfolio for the next one, three, six, nine, or 12 months. The five ranking periods and five holding periods were combined for a total of 25 portfolios, of which 24 showed positive returns and ten were statistically significant at the 1% or 5% level. The most significant strategy was the six-month ranking period and the six-month holding period (Strategy 6-6), which had a return of 80 bps per month, and most of the return came from the winner portfolio.

The longer ranking period strategies generated substantial returns over longer subsequent holding periods, while the one-month ranking period strategies were the least profitable and exhibited no consistency in subsequent performance. Returns for the momentum portfolios were mostly attributable to the winner portfolio. The combined momentum portfolios had lower standard deviation than the winner or loser portfolios alone.

The authors performed additional analysis on Strategy 6-6 to determine whether momentum returns were accounted for by additional risk factors and to account for implementation costs. Using a three-factor model, the strategy provided excess returns of 55 bps per month (6.6% per year). Momentum strategies typically involve extensive trading activity and transaction costs. After accounting for short-sale and transaction costs, Wang et al. estimated a revised risk-adjusted excess return for Strategy 6-6 of approximately 4%

per year, concluding that a momentum style of investing in value/growth and large/small can be implemented profitably.

Factor Investing: Long-Only versus Long-Short

David Blitz, Joop Huij, Simon Lansdorp, and Pim van Vliet. Working paper, March 28, 2014. Available at ssrn.com

Factor-based approaches to investing have been receiving substantial attention, particularly with the popularity of smart beta and the associated plethora of new products. Blitz, Huij, Lansdorp, and van Vliet compare the returns and risks of factor investing through a long-only portfolio versus a long/short portfolio, concluding that a long-only approach is the better alternative in most scenarios.

The authors compare a market portfolio,[1] a long-only factor portfolio, and a long/short factor portfolio to assess whether a long-only or long/short strategy for investing in factors (momentum, size, value, and volatility) is preferable. The long-only factor portfolio (Long-Only Beta 1) invested equally in the four underlying factors. The long/short factor portfolio (Long/Short Beta 0) invested equally in four corresponding long/short factors developed by the authors.

Individually, the long-only factors had a Sharpe ratio higher than that of the market portfolio. The Long-Only Beta 1 portfolio Sharpe ratio was higher than any of the individual long-only factors as well as that of the market (0.47 versus 0.27) and produced a return above the market (7.7% versus 4.2%).

Individually, the long/short factors had positive Sharpe ratios, although lower than the long-only counterparts. The Long/Short Beta 0 portfolio had the highest Sharpe ratio (0.73) of the constructed portfolios and the individual factors. However, the portfolio's return was essentially the same as the market.

The authors contend that constraints on short selling may make the reported long/short returns unachievable. Short selling also involves risks not represented by volatility, such as margin requirements, counterparty risk, unlimited short losses, and the risk of short recall. Other issues they consider with respect to factor portfolios include benchmark restrictions, implementation costs, and factor decay.

Investors with established market benchmarks will have more relative risk in a long/short factor approach. A long-only factor approach will achieve the market premium, adjusted for factor premiums, while a long/short factor approach is completely dependent on the performance of factor premiums. Long/short investors must have a strong belief in the continued existence of factor premiums.

The authors investigate overlaying a market portfolio onto the Long/Short Beta 0 portfolio to increase return and reduce relative risk. This Long/Short Beta 1 portfolio saw its Sharpe ratio decline to 0.54, closer to that of the Long-Only Beta 1 portfolio (0.47). Most of the risk of the Beta 1 portfolios was due to the market, reducing the diversification benefits of the factors.

To reflect more realistic forward-looking expectations of factor premiums, Blitz et al. incorporated implementation costs and potential decay in factor returns across several scenarios assuming different levels of costs and decay. They also looked at the performance of investment vehicles that provide factor premiums. Results from these and additional analyses showed that a long/short approach is more sensitive to implementation costs and factor performance decay. The extent of implementation shortfall for long-only passive products was small. The extent to which long/short factor premiums can be

[1] Their market return stream is based on value-weighted monthly US equity returns in excess of T-bills.

captured in practice is unclear, as this is a more recent product development and there are too few returns to adequately analyze.

The authors conclude that results showing large differences in the performance of a long/short approach versus a long-only approach should be carefully reviewed. A wide range of issues—including benchmarks restrictions, implementation costs, and operational risks—should also be considered when implementing factor investing.

Momentum Crashes

Kent Daniel and Tobias J. Moskowitz. Working paper, September 2013. Available at ssrn.com

Empirical research shows pervasive evidence of a return to the momentum factor, but the underlying mechanism driving returns is not yet known. Momentum has shown strong average returns, but occasional strong declines or "crashes" occur and can be severe and long lasting. The authors create a framework for a dynamic strategy that avoids the large losses associated with these crashes.

Focusing on US stocks from 1927 to 2013, Daniel and Moskowitz examine returns for a momentum portfolio of "winners" and "losers" (determined by the highest and lowest returns over the prior 12 months, excluding the most recent month) by first analyzing the 60-year sub-period from 1947 to 2006 to avoid the Great Depression, WWII, and the recent financial crisis. The "winner" sub-portfolio had an average excess return of 16%, strongly outperforming the "loser" sub-portfolio, which had an average excess return of -6%, while the market average excess return was 7.5%. The Sharpe ratio of the overall momentum portfolio (1.08) was roughly twice that of the market (0.52). The beta of the momentum portfolio was -0.25, resulting in a CAPM alpha of over 28%.

The full period 1927–2013 showed several momentum portfolio crashes, with the two largest declines associated with the Great Depression and the financial crisis. During crashes the loser sub-portfolio outperformed the winner sub-portfolio. Over the full period, while the winner sub-portfolio still outperformed the loser sub-portfolio, the overall momentum portfolio had a lower Sharpe ratio (0.71) due to the inclusion of the major crash periods.

Momentum experienced severe losses over long periods when the prior two-year market return was negative and then the market rose substantially in the month(s) subsequent to the "crash." Extreme momentum losses were clustered, while extreme momentum gains were not as large and were less clustered. Crash losses were mostly due to the performance of the loser sub-portfolio, because the stocks the loser sub-portfolio was shorting ended up experiencing sizeable gains.

Sizable changes in market beta help explain the large negative returns to momentum during crashes. Analysis of the winner and loser sub-portfolios produced betas that moved substantially, most notably for the loser sub-portfolio during volatile periods. Regressions on the overall momentum portfolio under differing market conditions showed that in bear markets the winner sub-portfolio tended to have a low beta and the loser sub-portfolio tended to have a high beta. When the market subsequently experienced a strong rebound, being short high beta stocks in the loser sub-portfolio resulted in substantially negative returns that dominated the return for the overall momentum portfolio.

The authors created a dynamic momentum strategy, based on *ex ante* estimates of market volatility, which they combined with a bear market indicator to forecast future momentum return. A bear market and high volatility were associated with low momentum return. Dynamically adjusting the weight of the momentum strategy using forecasted return and variance of momentum, with the weight distributed between the momentum and market portfolios, resulted in

the dynamic portfolio outperforming both a static momentum portfolio and the market.

Risk factors of size, value, and volatility were analyzed to try to explain momentum return in crashes. Using a three-factor model, the excess return of the momentum portfolio remained negative during crash periods. Results also indicated that momentum returns are related to volatility risk, but not explained by it.

As there are few crash periods to study, the authors replicated their analysis in different sample periods, in developed equity markets, and in a number of asset classes. Dynamic portfolios for asset classes and composites were created and compared to static momentum portfolios. Sharpe ratios improved by moving from a static momentum strategy to a dynamic momentum strategy in all equity markets studied (Europe, Japan, the United Kingdom, and developed equities) and all asset classes studied (equity and bond index futures, commodities, and currencies, as well as composite portfolios). ■