The Quest to Harness
Cyclicality for Better
Risk and Return

FACTOR
TIMING

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One of the hallmarks of SSGA's active quantitative investment process is maintaining consistent exposures to factors with durable, long-term value. At the same time, empirical evidence pointing to the inherent cyclicality of factors has fueled efforts to try to time them to improve both return potential as well as the ability to manage drawdown risk. The difficulty of timing factors has been well-documented, given the uncertainty of exogenous elements affecting their behavior and the complexity of the underlying relationships. However, we believe at the margin it is possible to time certain elements that can add value and improve outcomes. Aside from adding breadth to the investment process by including another dimension to an active manager's views, we believe trying to forecast factor pay-offs is a critical element in helping to reflect changes in the macro environment and account for the time-varying performance of factors. The following discussion looks at the kinds of systematic elements we believe are needed to time factors effectively. We describe how we applied the timing model developed by our Active Quantitative Equity team to universally defined factors, the same as those used in our Smart Beta strategies, to improve risk-adjusted returns.

Building a Factor Timing Framework

Factor premia are composed of three main components:

- Compensation for exposure to risk
- Return potential from irrational market participant behavior
- Effects of systematic and structural market frictions, such as market circuit breakers or restrictions on short selling

Each of these may be affected by different drivers at different times. For example, as market risk appetite waxes and wanes, the compensation for bearing an exposure to a risk embedded within a factor will move accordingly. Similarly, the extent to which markets overreact, underreact, or display other irrational behavior leading to systematic mispricings will vary over time as will the degree to which market frictions slow down or distort price discovery. Understanding the interactions of these dynamics is key to forming expectations of a factor's future pay-off.

We believe an effective timing framework should try to specify some common drivers of factor returns, notably:

- Factor valuation
- Factor persistence
- Macroeconomic cycle phase
- Risk sentiment

Just as an investor would expect a cheaper security to outperform an expensive one, or a recent winning stock to continue to outperform a recent loser, the same applies to a factor, to the extent that its return is driven by securities based on that factor.

To illustrate this kind of cyclicality, we plotted the information coefficient (IC) of the value factor against valuation spreads in Figure 1 over a 27-year period. The IC of value demonstrates the average power of the factor on a 12-month horizon. Valuation spreads measure the difference in book-to-price between the cheapest and the most expensive value basket and can indicate when a factor becomes cheap compared to its history.

For example, as cheaper stocks get cheaper and more expensive stocks continue rising, valuation spreads get wider and the value factor underperforms. At the same time, when this theme starts to look cheaper, the opportunity set increases. When spreads widen and cheap stocks fall well below their fair value, market participants start looking for value opportunities and the factor begins to outperform again.

Figure 1
Timing Value With Valuation Spreads
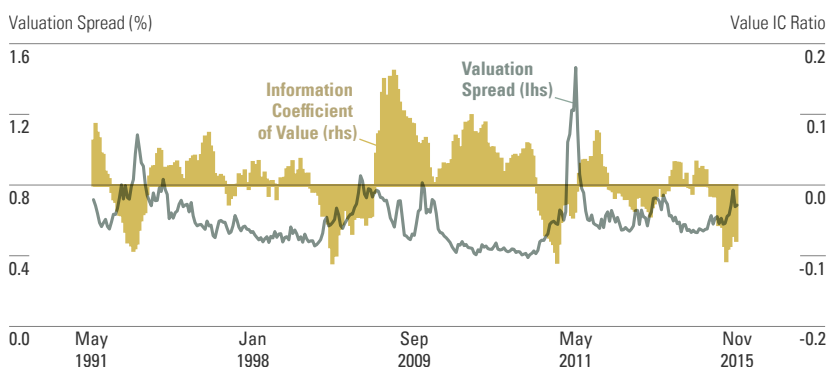
Source: Universe: MSCI World Standard Index. Past performance is not an indication of future results. Returns do not represent those of an index but were achieved by mathematically combining the actual performance data of index-member stocks arranged and re-weighted according to their value ranking. The performance assumes no transaction and rebalancing costs, so actual results will differ. Index returns reflect capital gains and losses, income, and the reinvestment of dividends

An important caveat to this relationship is the risk of rotating into value too early and withstanding some underperformance ahead of the factor's recovery. While it can be argued that it is better to be in too early than too late, we also recognize the importance of adding other dimensions to factor timing to strengthen predictive power.

Understanding where we are in the macroeconomic cycle and the degree of risk sentiment are two other important parts of a robust timing framework. These will create important head/or tailwinds for various factors, as market regimes shift across recession, recovery, boom periods and slowdowns. For example, while value stocks might be expected to fare better during economic recoveries, quality defensive stocks would be rewarded during recessionary and "risk-off" conditions. Sentiment-linked trending factors might do better during lower volatility regimes when market-leading stocks are not changing as much.

While these general factor timing principles may seem reasonable, the reality of factor performance is far more nuanced because the underlying causal links are time-varying. For example, compare the performance of brick-and-mortar–oriented value stocks struggling during the boom of the 1990s with value's excellent performance during the recession that followed. Similarly, value stocks with high credit exposures suffered during the global financial crisis but showed strong performance during the economic recovery, as shown in Figure 2.

Risk exposures embedded within sentiment factors may also vary over time in a more predictable manner, with risk-on sentiment coinciding with a prolonged market rally and becoming defensive after a bear market. As risk appetite changes, the implications for

Figure 2
Performance of Value Stocks Across Different Macro Regimes
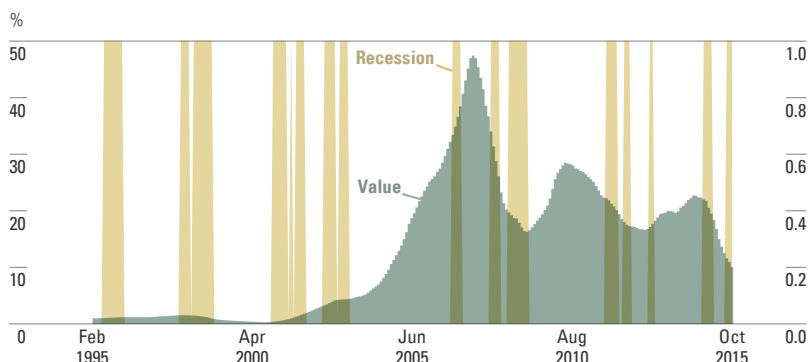
Past performance is not an indication of future results. Returns do not represent those of an index but were achieved by mathematically combining the actual performance data of index-member stocks arranged and re-weighted according to their value ranking. The performance assumes no transaction and rebalancing costs, so actual results will differ. Index returns reflect capital gains and losses, income, and the reinvestment of dividends.

Figure 3
Rolling 1 Year Correlation Between Axioma Momentum and Volatility
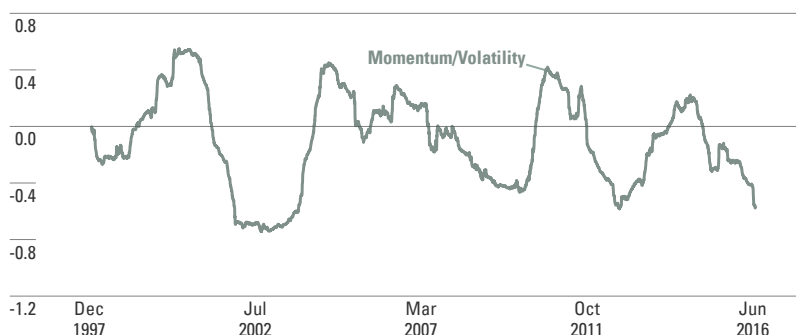
Source: SSGA Active Quantitative Equity Research team.

a given factor will depend on how it is exposed to a particular risk at a certain point in time.

Furthermore, these risk effects do not occur in isolation. The changes in risk on/risk-off sentiment can both reflect and affect the shifting expectations of the macroeconomic environment. Similarly, whether a factor is expensive or cheap, or has performed well or poorly recently — these dynamics

will interact with, and affect, other potential predictors. In other words, an effective timing model needs to reflect the dynamism of the drivers of factor premia as well as a range of other possible interaction effects. Last but not least, care should be taken to reflect the regional specificity of these factor drivers while mitigating the risk of over-tuning model signals to potentially spurious sampling noise.

Applying Factor Timing to Multifactor Smart Beta Strategies

Those are the central issues we considered when building our factor timing model. To test its effectiveness, we applied our proprietary dynamic weights to our static multifactor Smart Beta strategy over an 18-year time period.

Figure 4 illustrates the theoretical value added by SSGA's dynamic factor timing model to a static, equally weighted allocation to value, quality, momentum and low volatility. In a backtest, the dynamic portfolio outperformed the static portfolio by 1.08% on an annualized gross basis over the 18-year period, while the tracking error versus the MSCI World index decreased by 0.05%, resulting in an improvement in the information ratio from 0.88 to 1.17. Of course, given the dynamic reweighting of the portfolio, monthly one-way turnover increased from 8.24% to 11.29%.[1]

Understanding the interdependencies of macroeconomic and market behavioral influences on factor premia is indeed at the heart of the active quantitative process. Moreover, we believe that advances in big data and the tools to leverage that data may improve our ability to more accurately comprehend and harness the cyclicality of factors for better outcomes. In the meantime, we see distinct advantages in using top-down drivers of factor timing to add value to the active investment process by:

• Increasing long-term alpha potential

• Enhancing portfolio diversification with a dynamic approach to factor weightings; and

• Improving overall portfolio risk management by reducing the tail of drawdown risk.

While the results of the analysis we describe here are promising, it is important to acknowledge the notorious difficulties of timing factors with precision, especially in the short term. It is also important to emphasize that this is only one of many drivers of value in the active process as

managers continue to develop their skill in identifying and harvesting alpha sources. ■

[1] As for transaction costs, a proprietary, tiered transaction cost model was applied during the performance analysis. The levels of transaction costs varied across stocks but on average were about 9 basis points in our simulations.

Figure 4
Applying SSGA's Factor Timing Model to Smart Beta Factors

■ Value Added ■ Tracking Error ■ Turnover —●— Information Ratio
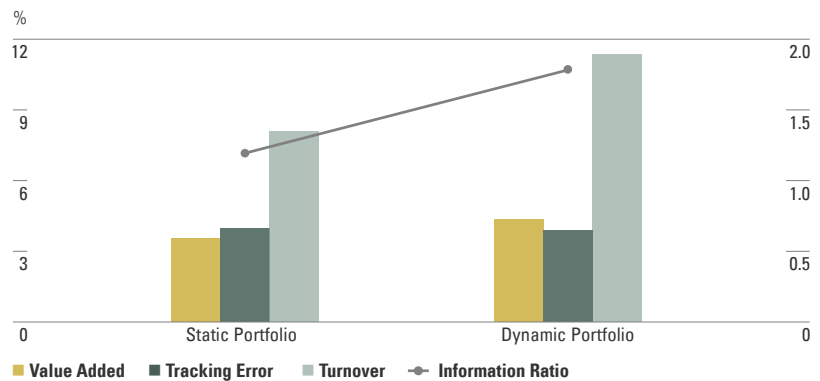
Backtest performance is not indicative of the past or future performance of any SSGA offering. The portion of results through 09/30/2015 represents a backtest of the Dynamic Factor-Timing model, which means that those results were achieved by means of the retroactive application of the model which was developed with the benefit of hindsight. All data shown above does not represent the results of actual trading, and in fact, actual results could differ substantially, and there is the potential for loss as well as profit. The performance does not reflect management fees, transaction costs, and other fees and expenses a client would have to pay, which reduce returns. Please reference the Backtested Methodology Disclosure for a description of the methodology used as well as an important discussion of the inherent limitations of backtested results.

Figure 5
Cumulative Net Active Return
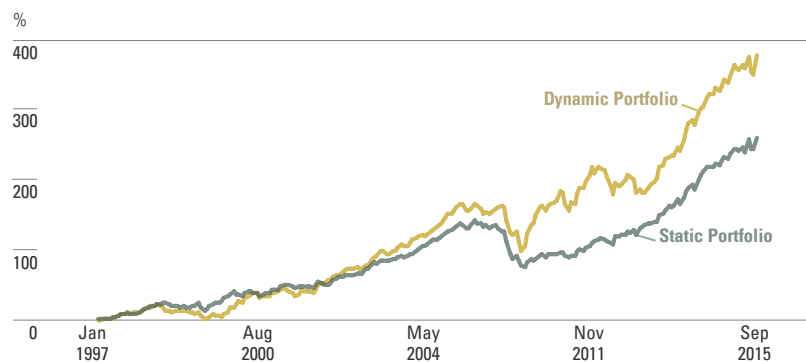
Past performance does not guarantee future results.

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