

# Do Alphas Have Betas?

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June 30, 2015

## Executive Summary

In the world that has evolved from the Capital Asset Pricing Model framework, a greater number of systematic exposures have been used to explain asset returns better, and obtain a better regression fit for the data. In these multi-regression models, the market is decomposed into a number of systematic beta factors, instead of just one catch-all market beta.

The relationships between these beta factors can be complex, and they are not completely independent from each other. One such interconnection that is often overlooked is the basic relationship between the well-known factor betas and the overall market beta. Perhaps the most intuitive way of understanding this is to state that some of these factors are pro-cyclical (positively related to the economy/market), while others are counter-cyclical (negatively related to the economy/market). Investors who understand these essential relationships can gain valuable insight.

This paper explores **Value** and **Momentum** factors, which are widely identified in related literature as systematic betas, as well as **Quality** factors, which are not as well publicized. It will demonstrate that **Value** and **Momentum** factors are pro-cyclical with positive market betas, while **Quality** factors are counter-cyclical with negative market betas. Furthermore, most active investment strategies have a strong pro-cyclical element, and therefore, have “betas” in their alphas.

In light of this, the rising popularity of low-volatility, low-beta approaches is not surprising. Such strategies are counter-cyclical and are available in various flavors, through either active management or more passive ETFs. While they are counter-cyclical and afford downside risk protection, the likely trade-off is underperformance in up markets.

One viable alternative is a quality-oriented factor portfolio. Rather than simply creating a portfolio based on stock volatility characteristics, a quality-based strategy selects securities based on alpha characteristics that are also associated with less downside risk and lower volatility. With some additional volatility and beta controls, the end result can achieve the desired end goal without sacrificing long-term excess return potential.

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## Introduction

In the Capital Asset Pricing Model, or CAPM (Miller-Lintner-Sharpe<sup>1</sup>), the performance of an asset is related to the performance of the total market based upon its composition of systematic, or market-based, risk. The returns of the asset are decomposed through a linear regression into two primary components of systematic risk: beta (the slope term) and alpha (the intersection term), as well as a residual error term. Essentially, the CAPM beta relates the portion of the total return explained by the market's movements, while the alpha—as well as the residual error term—attempts to isolate the elements entirely unrelated to market movements.

In the world that has evolved from the CAPM framework, a greater number of systematic exposures have been used to explain asset returns better, and obtain a better regression fit for the data. These models have evolved from the generic multi-factor Arbitrage Pricing Theorem, or APT (Roll and Ross<sup>2</sup>), through the latest 5-factor Fama-French model, which is most commonly used in academia. In parallel development are the multi-factor alpha/risk models used for both asset management and attribution by practitioners, such as Barra and Northfield, among others.

In these multi-regression models, the market is decomposed into a number of systematic beta factors, instead of just one catch-all market beta. The widely recognized additional beta factors encompass traditional valuation metrics, like **Price-to-Book**, as well as factors that are more growth-related, such as **Price Momentum**, as well as factors related to a stock's market capitalization. Just because these other factors have been identified as separate beta factors in stock returns doesn't necessarily mean they have no relationship to the traditional market beta, though. In technical terms, it means these factor betas are not perfectly orthogonal to each other or to the market beta. In fact, there is often multicollinearity of these systematic factors with each other and with the market. Even casual market observers will agree that there is a positive correlation between the systematic factors of size and value, for instance.

In other words, there are relationships between variables that can be complex, and these factors are not completely independent from each other. One such interconnection that is often overlooked is the relationship between the well-known factor betas (i.e. value, size, momentum) and the overall market beta. Perhaps a more intuitive way of understanding this is to state that some of these factors are pro-cyclical (positively related to the economy/market), while others are counter-cyclical (negatively related to the economy/market). Investors who understand these essential relationships can gain valuable insight.

This paper will explore **Value** and **Momentum** factors, which are widely identified in related literature as systematic betas, as well as **Quality** factors, which are not as well publicized. It will demonstrate that **Value** and **Momentum** factors are pro-cyclical with positive market betas, while **Quality** factors are counter-cyclical with negative market betas. Furthermore, most active investment strategies have a strong pro-cyclical element, and therefore, have “betas” in their alphas. This is true even for supposedly uncorrelated strategies, such as “market neutral,” that employ such factors. Although the market beta may be removed from a portfolio by stripping out the market benchmark, a residual market beta-related component often exists in the remaining alpha. However, active value and active momentum/growth strategies do tend to be pro-cyclical at different stages of the market cycle. These differences are beneficial in portfolio structuring. While **Quality** is counter-cyclical, very few active strategies exhibit this pattern as the primary characteristic, which explains some of the appeal of specific low-volatility, low-beta approaches.

## The Beta in Value and Growth/Momentum Alphas – Pro-Cyclical

### Value Strategies

Value factors are among the betas well recognized for their long-term efficacy in contributing to excess returns above the market. Not surprisingly, value managers will outperform when valuation factors (**P/B, P/S, P/E, P/CF, P/FCF**, etc.) are working well. These factors provide the best returns when there is wide dispersion in valuations between stocks and/or sectors. This dispersion is generally widest after a recession or bear market, and it subsequently shrinks over the course of an economic/market expansion. As the multiple dispersion across sectors and stocks contracts, and as those multiples revert to the mean, it means the valuation factors are working. Valuation factors generate their return through reversion to the mean.

Therefore, there is a pro-cyclical element to traditional valuation factors. They work best when the market is climbing from the trough of the market at a very steep rate of ascent. As such, these strategies can actually have high correlations with market beta at certain times. This is confusing to most investors because there is a distinction between the components of “value” that are pro-cyclical and those components of “value” that are counter-cyclical. Both elements are present in value indexes, but active value managers usually emphasize the pro-cyclical sectors and stocks.

This distinction between pro-cyclical “value” and counter-cyclical “value” is intertwined with volatility. Historically, **Value** factors are associated with both anomalous excess returns over the market, as well as concomitant lower risk, as measured by standard deviation. This is an anomaly that it is a violation of the CAPM – simultaneous higher returns and lower risk. Interestingly, this often results from combining cyclical and counter-cyclical components in a quasi-asset allocation framework.

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Pro-cyclical “value” is comprised of stocks that are actually higher volatility/beta and lower quality. Counter-cyclical “value” is composed of stocks that are lower volatility and higher quality. Generally, these different types of value have strong sector-related elements to them. Over time, the value indices tend to have substantially higher average sector weights to **Financials, Energy, Basic Materials** and **Utilities** and somewhat higher weights to **Consumer Staples** and **Health Care**. The growth indices tend to have higher average weights to **Technology, Industrials** and **Consumer Discretionary**.

Table 1: S&P 500 Sectors (October 1989 - March 2015)

S&P 500 Sectors	Total Return	Standard Deviation	Beta
<b>Value-Oriented Sectors:</b>			
Financials	8.11	21.88	1.26
Materials	8.21	19.82	1.07
Energy	10.89	18.20	0.77
Health Care	12.44	15.57	0.71
Utilities	8.26	15.00	0.44
Consumer Staples	11.50	13.24	0.59
<b>Growth-Oriented Sectors:</b>			
Technology	10.54	25.24	1.39
Consumer Discretionary	10.10	17.81	1.09
Industrials	9.95	17.33	1.08

Source: Morningstar EnCorr and Chicago Equity Partners

Within value indices, **Financials and Basic Materials** –and to a lesser degree, **Energy**– are more pro-cyclical. It is not surprising to think of these segments of the market as being highly related to the economic and earnings cycle. Certainly, **Basic Materials** represents the raw inputs of production, and are often considered very early cycle stocks while the **Financials** are highly related to the overall level of economic activity. These sectors have relatively higher demonstrated market volatilities and market betas that are comparable to those sectors traditionally considered growth-oriented. Conversely, **Utilities** and **Consumer Staples** are clearly counter-cyclical and defensive. They have lower demonstrated volatilities and market betas. **Health Care** is also somewhat defensive.

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Pro-cyclical components of value primarily drive value index outperformance of the market in periods of low-quality, high beta, cyclical recovery rallies, like 2009. Counter-cyclical components of value drive the outperformance of value indexes in periods of market downturns, like 2008, which emphasize low beta, higher quality and lower volatility. Distinguishing between these different components that comprise value indexes is critical to understanding the performance of most active value strategies.

Most traditional active value managers do well when valuation spreads are wide and narrowing. Active value managers usually have more exposure to the pro-cyclical sectors, rather than the counter-cyclical sectors. They tend to have lower weight to defensive stocks and also more weight to smaller cap stocks, on average.

Table 2: Relative Sector Weights

	Technology	Cons Disc	Telecom	Health Care	Finance	Energy	Basic Matls	Cons Staples	Industrials	Utilities	Real Estate
MS LCV Deep Value Universe Average	12.46	8.77	3.33	14.37	23.87	10.58	2.75	6.38	9.50	3.27	1.75
Russell 1000 Value Index	10.11	6.82	2.18	14.10	23.80	10.85	3.37	7.07	10.61	6.09	4.88
Relative Overweight/ Underweight	2.35	1.95	1.15	0.27	0.07	-0.27	-0.62	-0.69	-1.11	-2.82	-3.13

Source: Morningstar Direct, Chicago Equity Partners

Table 2 above shows the average sector weights for those mutual funds classified as Large Cap Deep Value by Morningstar relative to the Russell 1000 Value Index as of March 2015. There is a consistent overweight in high volatility, high beta sectors—especially growth-oriented sectors—and a consistent underweight to low volatility, low beta sectors. So, the highest overweights are to **Technology** and **Consumer Discretionary**, which are high volatility, growth-oriented segments. Among traditional value-oriented sectors, the largest underweights on average are in the low-volatility, defensive **Utilities**, as well as **Real Estate**.

On the following page, Exhibit 1 shows the monthly returns for the **Book-to-Price (B/P)** value factor, and Exhibit 2 shows the performance pattern of the median active value strategy in Evestment Alliance. As demonstrated in the exhibits, the best median value manager performance is during periods when the **B/P** factor return surges. These surges follow periods of market distress when valuation spreads are wide. The factor returns to **B/P** accompany the market rebound that follows these downturn periods as valuation spreads revert to the mean. Therefore, the alpha is pro-cyclical.

In other words, there is a market beta in the alpha.



Exhibit 1: Return to B/P Factor, Monthly Regression Coefficient

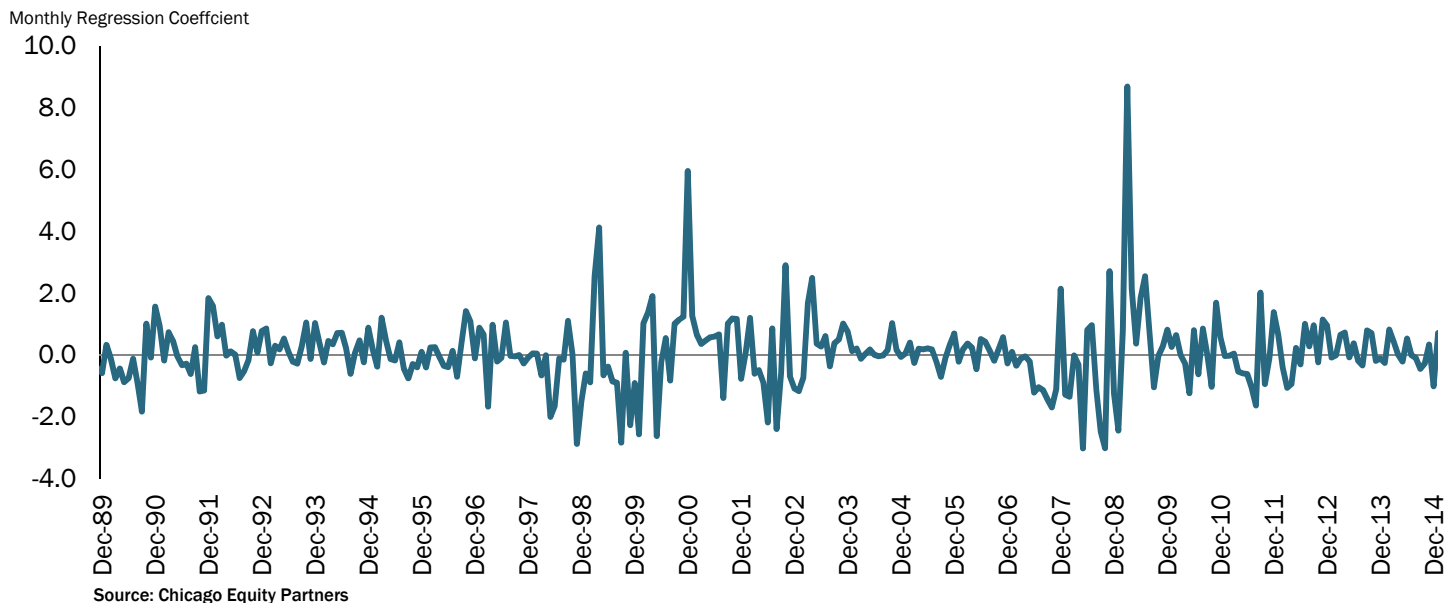
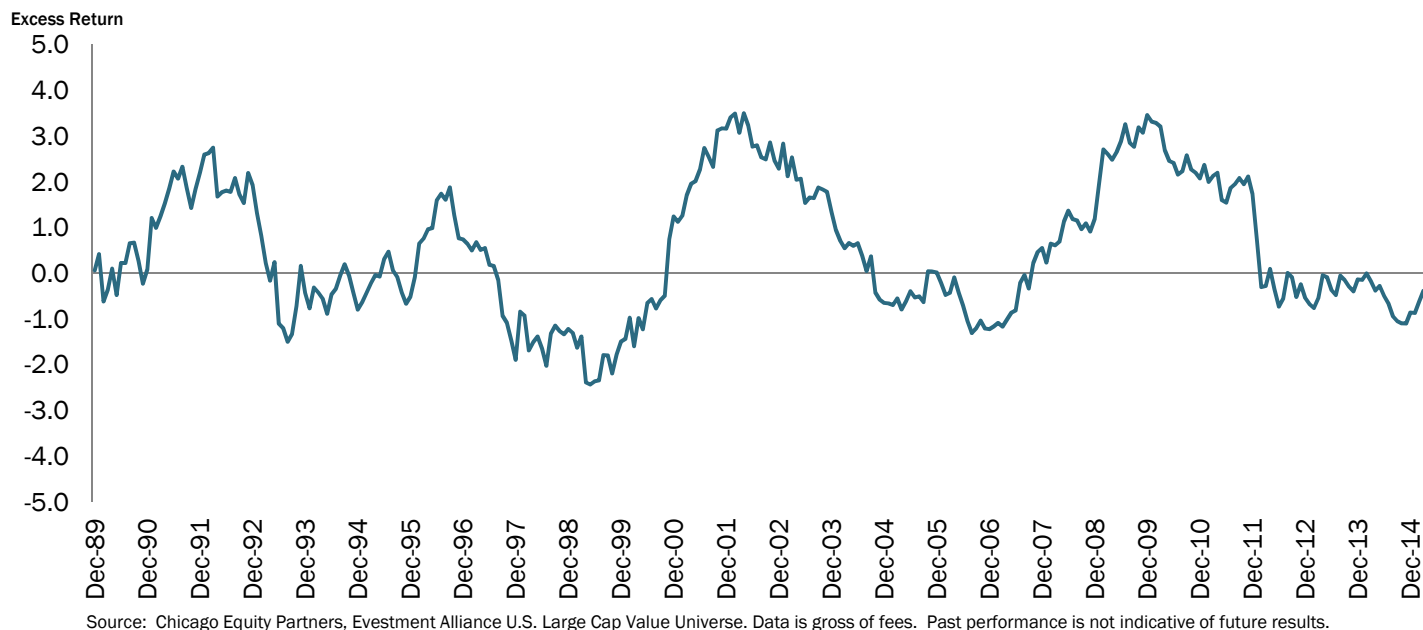


Exhibit 2: Evestment Large Cap Value Universe Median Excess Returns  
Rolling 3 Year Excess vs. Russell 1000 Value Index



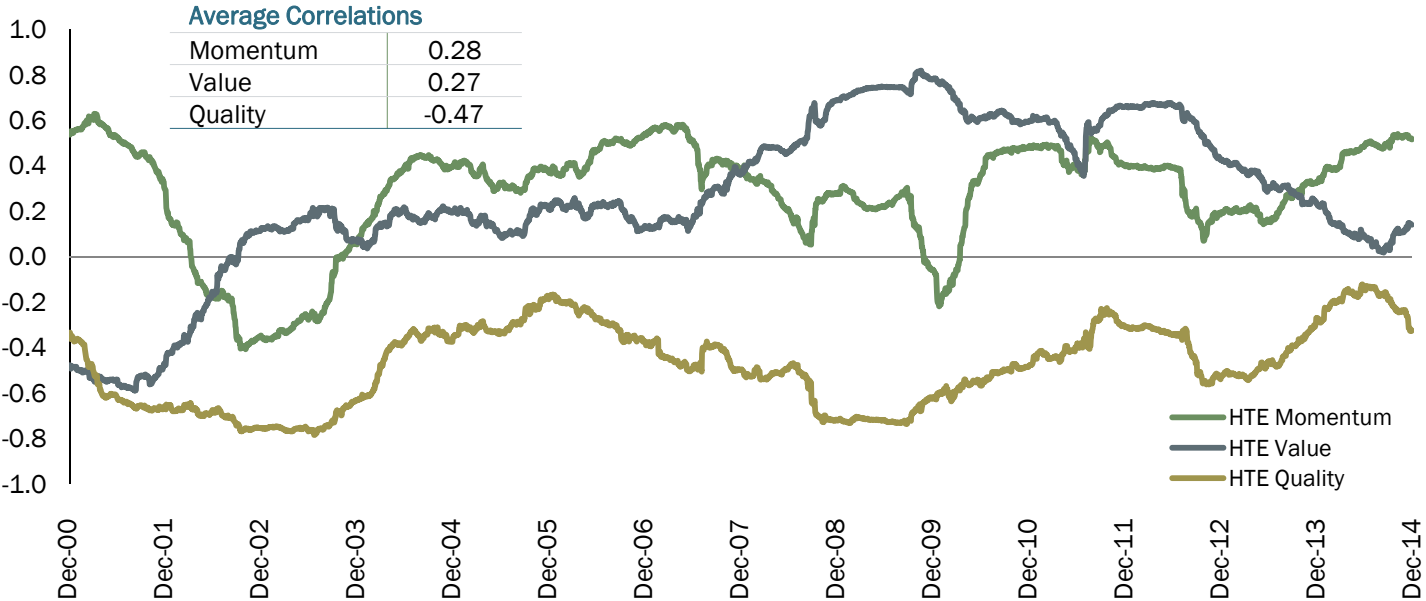


To empirically demonstrate this, we construct simple factor portfolios and measure the correlation between their excess returns and the market return. The result is shown in Exhibit 3. This graph shows the market correlations of high tracking error (HTE), factor based portfolios for **Momentum**, **Value** and **Quality** factors. These portfolios emphasize a mixture of factors within each group, based upon Chicago Equity Partners' (CEP) factors. They are meant to represent more extreme tail exposures, which allows for higher standardized exposures to the factors.

The average correlation between the **Value** factor portfolio and the market index is positive 0.27, on average, from 2001 to 2014, which is not very different from that of a **Momentum** factor portfolio, which is positive 0.28. The difference between them, with respect to their market relationships, lies in timing.

Therefore, for value strategies we see: 1) Active value managers emphasize higher volatility, higher beta sectors; 2) **Value** factor returns are best when the market returns are the highest in early stage recoveries, which are key data leverage points; and 3) Empirically, a **Value** factor portfolio demonstrates a market beta, on average, similar to that of a **Momentum** factor portfolio.

Exhibit 3: Beta of Factor Alpha – Pro-Cyclical vs. Counter-Cyclical Factors  
 Rolling 252 day Correlation of HTE Factor Portfolios' Excess Returns vs. Russell 1000 Index



Source: Chicago Equity Partners

## Momentum / Growth Strategies

Although a positive beta exposure for value portfolios may seem counterintuitive, it seems very intuitive for growth portfolios. Growth managers will typically outperform when momentum and growth factors are working (**Price Momentum, Estimate Momentum, Expected Earnings Growth, Earnings Surprise, etc.**). This generally occurs during sustained economic and market expansions, when market returns are also positive. As shown earlier in Table 1, volatility and beta characteristics of growth-oriented S&P sectors are intuitively higher than the market average. Growth managers maintain higher weights to these sectors, on average.

As Exhibit 3 illustrates, momentum factors are largely pro-cyclical—meaning that there is a positive market correlation. The notable exception to this general rule is when a market inflects from a downturn into a subsequent sharp rebound, like 2003 and 2009. Early in the cycle, momentum factors will tend to have a brief negative relationship with market returns as the primary trends inflect. In fact, there is actually an inverse correlation between returns to a traditional value factor, like **B/P**, and factors like **Price Momentum** or **Estimate Revisions**.

This is best illustrated in Exhibit 4, which shows the return to a broad-based momentum factor (consisting of both **Price Momentum** and **Estimate Momentum**) applied in a sector-neutral fashion. Dips in the momentum factor return in 2002-2003, 2008-2009 and 2012-2013 correspond with dips in the beta of the momentum portfolio in Exhibit 3.

Exhibit 4: Momentum Factors, Forward 12-Month Regression Coefficient



Source: Chicago Equity Partners



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Therefore, growth/momentum strategies are not correlated with the market during the early stages of recoveries. That's when value factors do the best and have the highest market correlation. Instead, momentum factors have the highest correlation later in the market cycle, when clear trends have already been established. Paradoxically, both traditional growth/momentum and traditional value strategies are pro-cyclical over a market cycle, but not with each other! Each factor strategy peaks in terms of correlation with the market at slightly different points in the cycle. They both have betas in their alphas, but those betas are not synchronized.

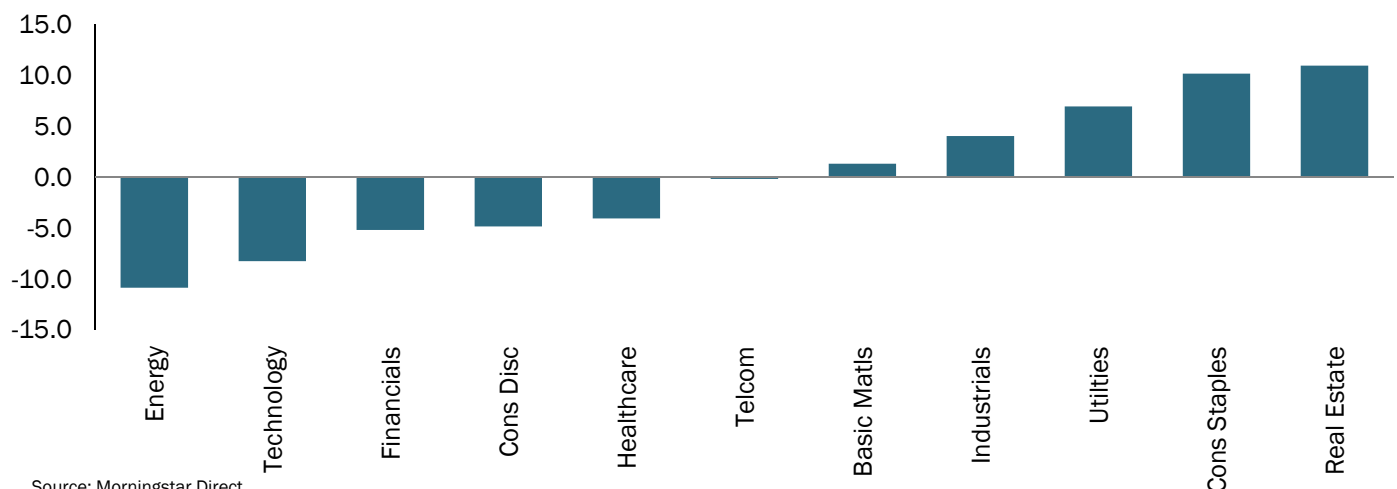
Value was actually more pro-cyclical (higher beta) during the decade 2000-2009, when performance was essentially sideways, because there were multiple opportunities for market downturns and subsequent market rebounds. It was much less pro-cyclical during the sustained expansionary period of the 1990s. During a sustained expansion, value factors will exhibit lower betas, while momentum factors will have consistently positive returns and consistently positive market betas.

Importantly, while there is some positive market beta in both respective alphas, neither active value nor momentum/growth strategies are expected to consistently outperform in market downturns. This is because neither set of factors, on which these strategies are based, is truly counter-cyclical.

### Counter-Cyclical Approaches – Low Volatility vs. Quality

One specific sub-set of value strategies is counter-cyclical. This sub-set encompasses low-volatility and low-beta strategies. Almost without exception, these strategies employ heavy tilts toward the sectors with the lowest betas and volatilities, such as **Utilities** and **Consumer Staples**. It is important not to confuse these strategies with fundamental indexing or similar Smart Beta approaches that tilt to higher volatility components, Value and Size. There are numerous active low volatility strategies in the marketplace, as well as more passive ETF approaches.

Exhibit 5: PowerShares Low-Volatility ETF (SPLV), 3/31/15 Sector Over/Underweights vs. Value Index



Source: Morningstar Direct

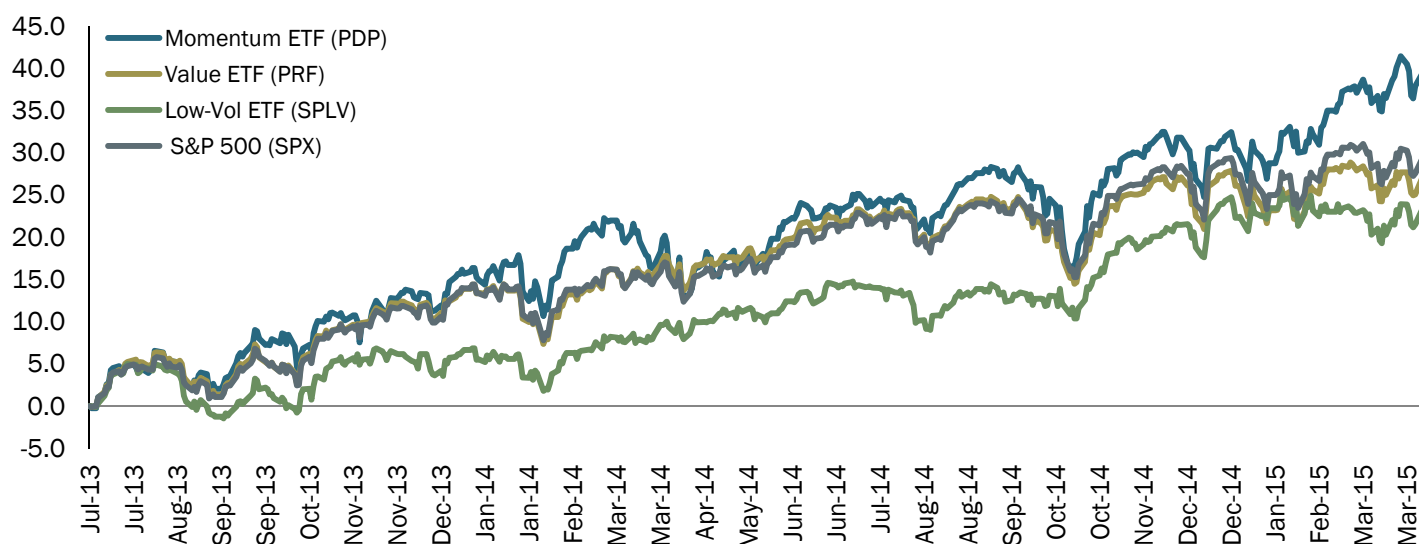
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On the previous page, Exhibit 5 shows one such ETF strategy— Powershares S&P 500 Low Volatility ETF (ticker: SPLV). It is heavily overweighted to **Utilities, Consumer Staples** and **Real Estate** sectors, which exhibit lower volatility and lower beta versus the value index. It is heavily underweighted to **Energy, Technology** and **Financials**, which are higher volatility and higher beta sectors.

So far, so good. If an investor is looking for downside protection that will do relatively better than pro-cyclical growth and value strategies in a market downturn, these low volatility strategies will provide some protection. Many of these strategies, however, are marketed as long-term alpha plays capitalizing on “low beta, low volatility” anomalies. If an investor is expecting to outperform the market in the long run through such an approach, we think that they are likely to be disappointed. Certainly, such strategies will not work on a consistent basis. Value indices have outperformed in the long run with lower volatility because they mix pro-cyclical, beaten-down stocks that are actually high volatility and beta at attractive prices along with lower volatility, lower beta counter-cyclical stocks. The favorable long-term results stem in part from a quasi-asset-allocation effect.

Strictly relying on the lower volatility, lower beta, counter-cyclical value constituents is likely to provide those exact benefits, but not the overall outperformance associated with traditional value strategies. Exhibit 6 illustrates the recent performance of the low-volatility ETF (ticker: SPLV) compared with the broad market (SPX), along with momentum (ticker: PDP) and value (ticker: PRF) ETFs from the same fund family of PowerShares. Each of these strategies largely expresses their factor bets through sector tilts, rather than at the stock level within each sector. The low-volatility approach, not surprisingly, has underperformed in this recent market upturn.

**Exhibit 6: Cumulative Returns of Factor ETFs vs. Market (6/30/13 - 3/31/15)**



Source: Thomson Reuters Baseline, (PDP) Powershares DWA MOTM, (SPLV) Powershares S&P 500 Lo Vol, (PRF) Powershares FTSE RAFI Value

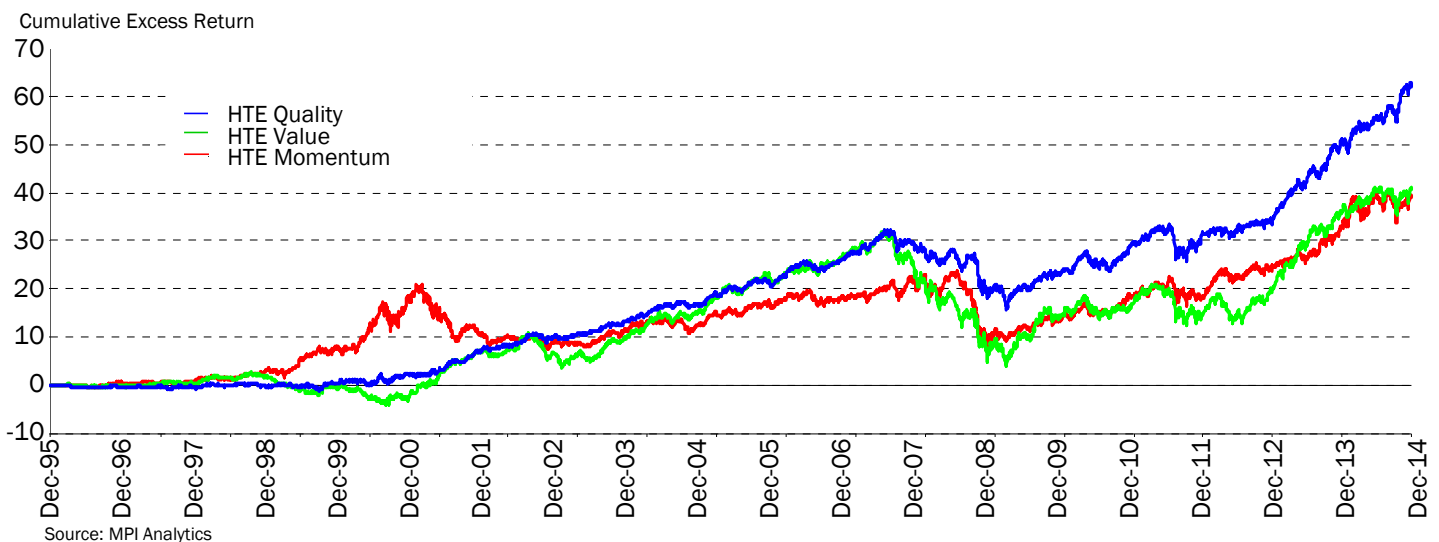
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Over the last couple years that these ETFs have been available, the market has largely continued in a solid upward trajectory, as represented in the chart. The momentum ETF has handily outperformed, as would be expected because of the overweight to higher volatility, higher beta sectors. In an up market, high beta should pay off. The low beta, low volatility ETF is the worst performer, as expected. It performed the best over the short time frames in which the market pulled back in this longer-term expansion, but not over the entire timeframe. Once again, in an up market, low beta should not pay off! If an investor is expecting long-term outperformance from specifically constructed low volatility, low beta strategies, this is only likely in an extended sideways market as we experienced in the 2000s. Once low volatility, low beta strategies have established an extended track record, investors are likely to be disappointed with the returns generated if we remain in an extended bull market.

If an investor is interested in counter-cyclical alpha production, downside market protection and long-term market outperformance, quality-oriented strategies may be more appropriate. Among traditional alpha factors, the **Quality** group is the most defensive in its orientation, and is the most counter-cyclical in its alpha—see Exhibit 3. It is the factor set that works best in market downturns. This tends to be true in short-term downturns, but even more pronounced in extended downturn regimes. There are not many active quality-oriented managers. Pure quality portfolios are almost non-existent in a marketplace full of active value and growth strategies with largely pro-cyclical alphas. As such, investors can add quality-oriented strategies in a multi-manager framework to counterbalance more typical pro-cyclical alpha production.

If an investor is specifically sensitive to downside protection, approaches can be designed that encompass a quality-oriented defensive approach with beta controls. This type of strategy has the potential to outperform the market in the long run, unlike strict low volatility, low beta strategies, while actually providing similar downside protection and a similar volatility profile.

Exhibit 7: Cumulative Excess Return vs. Russell 1000 Index (6/1/95 - 12/31/14)





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**Quality** is comprised of factors focusing on the balance sheet and income statement that encompass a range of metrics, including earnings quality and corporate leverage, among other things. Exhibit 7 shows the same factor portfolios that we utilized in Exhibit 3 to illustrate the market beta behavior. This chart shows the cumulative excess return for the factor portfolios. In the long run, the quality alpha-factor portfolio is just as efficacious as momentum-based or value-based alpha factor portfolio strategies.

Yet, a quality-oriented portfolio has some unique and desirable properties in terms of its beta and volatility profile, as well as its complementary relationship with other pro-cyclical strategies. Table 3 shows an overall daily excess return batting average similar to that of momentum or value. The composition of up and down market capture ratios and batting averages is completely different, however. The beta is also much lower, which leads, of course, to a higher concomitant measured alpha (excess return adjusted for beta). The lower beta also leads to a higher Treynor Ratio, while the lower variance leads to a higher measured Sharpe Ratio.

Table 3: Statistical Summary (6/2/95 - 12/31/14)

	Alpha%	Beta	Sharpe Ratio	Treynor Ratio	Batting Avg	Up Mkt Capture%	Up Mkt Batting Avg	Down Mkt Capture%	Down Mkt Batting Avg
HTE Momentum	2.426	1.084	0.510	0.087	52.4%	117.6	60.9%	104.7	42.3%
HTE Value	2.582	1.085	0.509	0.088	52.9%	110.3	55.5%	102.2	49.7%
HTE Quality	4.404	0.861	0.655	0.124	52.8%	82.7	39.1%	90.0	69.1%

Source: Chicago Equity Partners

Therefore, investors that are interested in simplistic low volatility, low beta approaches because of the attractive risk/return trade-off should explore alternative quality-based factor strategies, which have a much better long-term return profile with similar counter-cyclical properties.

## Conclusion

What does it mean for alphas to have betas? Quite simply, it means that the timing of alpha is related to the market. Some strategies are pro-cyclical and produce their alpha mostly when the market itself is generating returns. This pro-cyclical alpha production applies to most active strategies. Although this is somewhat intuitive for momentum and growth approaches, it is less intuitive for value approaches. This paper has attempted to explain that conundrum through a decomposition of typical sector bets, as well as the return pattern of value factors in relation to market returns. Empirically, momentum and value approaches are both pro-cyclical. In other words, they do have betas in their alphas. The exact timing of this alpha production is different, and each approach is most correlated with the market at different points in the economic/market cycle.

Investors have always had a desire for some counter-cyclical alpha production. “Why can’t managers outperform when markets are going down and I need that outperformance the most?” is a typical investor refrain. Unfortunately, there is not a copious supply of such investment vehicles. In light of this, the rising popularity of low volatility, low beta approaches is not surprising. These are available in various vehicles, through either active management or more passive ETFs. While they are counter-cyclical and afford downside risk protection, the likely trade-off is underperformance in up markets. In the long run, we expect markets to go up, which is a potential problem for these strategies.

One viable alternative is a quality-oriented factor portfolio. Rather than simply creating a portfolio based on stock volatility characteristics, a quality-based strategy selects securities based on alpha characteristics that are also associated with less downside risk and lower volatility. With some additional volatility and beta controls, the end result can achieve the desired end goal without sacrificing long-term excess return potential.

## Endnotes

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