

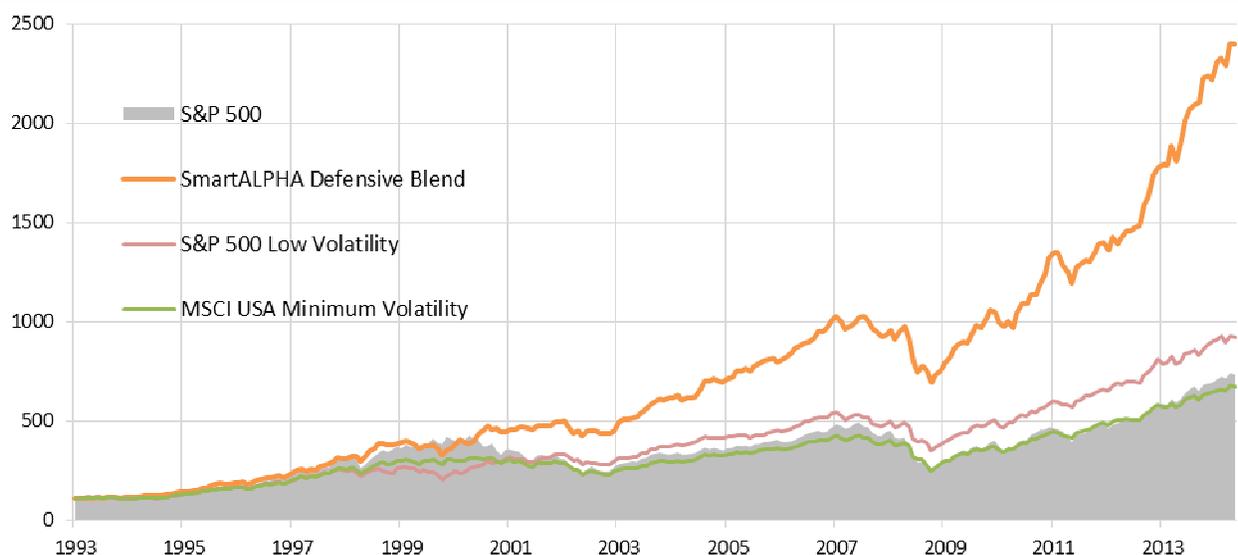
# SmartALPHA™ Defensive Equity Indexes

## A Fundamental Approach to “Low Volatility” Investing

### Executive Summary

- ❑ Reflecting the academic research on the low volatility effect, currently available low volatility products are mainly driven by statistical volatility – the standard deviation of stock price change over a defined period.
- ❑ However, price volatility is just a reflection of fundamental risk, which in turn has two main components, macro risk and company-specific risk. It is only by defining and quantifying these risks that a truly defensive equity strategy can be designed.
- ❑ We develop a defensive equity strategy that combines top-down and bottom-up dimensions and provides greater opportunity in both risk management and returns relative to currently available low volatility products.
- ❑ The SmartALPHA™ Defensive Strategies target contemporaneously high returns and low volatility through a systematic process that selects defensive stocks with high expected alpha.
- ❑ Our approach is intuitive, rooted in fundamental analysis, and generates an asymmetrical return pattern with strong downside protection and remarkable upside participation.

Cumulative Growth of 100: May 1993 - September 2014



Source: Morningstar Direct, Crest Investment Partners LLC.

[Massimo.Santicchia@crestinvestmentpartners.com](mailto:Massimo.Santicchia@crestinvestmentpartners.com)

[Katherine.Gallagher@crestinvestmentpartners.com](mailto:Katherine.Gallagher@crestinvestmentpartners.com)



## 1. Introduction

In the aftermath of the 2008 financial crisis, scarred by huge portfolio losses, investors increasingly demanded investment vehicles that could offer protection in falling, volatile markets.

At the same time, numerous academic studies were published on the so-called “low volatility anomaly”: contrary to finance theory, over the long term, stocks with lower price volatility have out-performed stocks with high price volatility.

The low volatility effect is not new. Researchers Robert Haugen and James Heins in the 1970s wrote about this effect in a seminal paper.<sup>1</sup>

As an outgrowth of the 2008 financial crisis, this anomaly was “rediscovered” and “productized.” Since then, a number of “low vol” products have flooded the industry and raised several billion dollars in assets; investors have embraced the concept and low equity volatility is now a new asset class.

Reflecting the academic research, the existing low volatility strategies available today are mainly driven by statistical volatility – the standard deviation of stock price change over a defined period.

But, what’s the actual merit of these strategies? Is it sound to invest money in strategies that in essence select stocks based merely on their past price fluctuations? What goal is an investor trying to achieve with these strategies? If the goal is to maximize long-term cumulative growth through downside protection, we believe building a fundamentally driven low-volatility strategy offers greater potential.

Is there a more purposeful way to build low volatility, defensive strategies? We will review the current low volatility methodologies and products and propose a more logical and more effective approach: the SmartALPHA™ Defensive Strategy Indexes. These include a Growth and Value index, and an annually equal-weighted blend of the two indexes.

## 2. Current Types of Low Volatility Strategies

Current low volatility strategies follow one of two methodologies: minimum variance optimization strategy or non-optimized low volatility strategy.

Figure 1 describes two representative low volatility index methodologies, the S&P Low Volatility Index and the MSCI Minimum Volatility Index.

Optimization-based Indexes are calculated by optimizing an existing equity index (such as the MSCI USA Index or the Russell 1000) using an estimated covariance matrix to produce a portfolio that has the lowest expected volatility for a given set of constraints. Thus, in optimized models, it is assumed that stocks have the same expected return and volatility and correlations are estimated using a risk model. These indexes lack transparency and, in an attempt to reduce tracking error, have significant exposures to non-defensive sectors. Consequently, they do not provide strong downside protection – which is a major reason why an investor would invest in a low volatility strategy in the first place.

Figure 1. Selected Low Volatility Methodologies

	S&P 500 Low Volatility Index	MSCI USA Min Volatility Index
<b>Definition of Risk</b>	Standard deviation of the daily price returns over the prior 12 months	Barra Covariance Model (variance and correlations)
<b>Methodology</b>	The 100 least volatile stocks in the S&P 500 are weighted inversely proportional to their volatility	Forecast volatility using minimum variance optimization
<b>Constraints</b>	None	Sector and risk-factor. Max holding size 1.5%
<b>Assessment</b>	Simple and transparent; good cushion in down markets, but limited upside	“Black Boxy”, benchmark sensitive; sector constraints limit downside protection

Source: Crest Investment Partners, Index Providers Websites

<sup>1</sup> Robert A. Haugen and A. James Heins, “Risk and the Rate of Return on Financial Assets: Some Old Wine in New Bottles.” Journal of Financial and Quantitative Analysis, Vol. 10, No. 5, December 1975.

Non-optimized models simply sort stocks on their past price volatility and select the least volatile ones. Each stock in the index is then weighted by the inverse of its volatility, so that the stocks with lower volatility receive the higher weights. These indexes are transparent and provide good downside protection, but they tend to be very concentrated in the utilities sector and lack participation in up markets.

Both methodologies are mainly driven by volatility of stock prices and do not target or maximize returns. As we show in the performance analysis section, these statistical low volatility strategies lag in a rising market typically associated with economic rebounds and expansions. This lack of upside participation results in longer time to recover from drawdown valleys, representing an investment risk as it may impair the investor’s portfolio growth over the long run.

As we discuss later, at the end of the day, the real risk for an investor is not the short-term stock price fluctuations, but the inability to preserve and grow wealth over the investment horizon. This requires a strategy that provides downside protection without renouncing to long term growth.

We’ll proceed as follows. We first highlight the difference between statistical and fundamental risk. We then define and separate fundamental risk into macro and firm-specific risks. Finally, we describe the investment process employed by the SmartALPHA™ defensive strategy indexes and review their performance versus the overall market and other low volatility strategies.

### 3. A Myopic Definition of Risk

Low volatility strategies define risk merely as price volatility. Standard deviation is a measure of absolute volatility that shows how much an investment’s return varies from its average return over time.

To understand the flaws of defining risk with price volatility consider this example: suppose the price of a stock goes up 20 percent in one month, 10 percent the next, and 5 percent in the third month. The standard deviation would be 7.6 with a return of 38.6 percent. Compare this to a stock that declines 10 percent three months in a row. The standard deviation would be zero with a loss of 27 percent. An investor holding the falling stock might find little consolation knowing that the loss was incurred completely “risk-free.”<sup>2</sup>

In addition, protracted periods of low volatility in an individual security or entire asset class, do not portend continuous future stability.

Actually, the evidence tends to show that the opposite is true: extended periods of low volatility are followed by high volatility. One only needs to remember that the 2008 financial meltdown was preceded by one of the lowest market volatility readings in history but, as we all know, it ended up in tears.

Thus, a low standard deviation of returns over the measurement period may give investors in low volatility strategies only a false sense of security.

We believe that focusing only on statistical volatility is superficial as it confuses the cause (fundamental risk) with the effect (price volatility).

In fact, the true limitation of low volatility strategies is that they select stocks with no consideration to their economic characteristics despite extensive evidence that company-specific fundamentals (i.e., valuation, earnings persistence) are related to future stock risk and returns.

<sup>2</sup> Adapted from: “Risk is Not The Same as Volatility”, Michael Keppler, Die Bank, November 1990, No. 11.

#### 4. Statistical vs. Fundamental Risk

The price fluctuation of a company’s stock- and therefore its volatility - is determined by the trading activity of investors who buy and sell shares according to their views and emotions. But stocks are not just price charts or quotes on a monitor that change every second. Equity shares represent ownership in a company’s business. Therefore, to understand the risks of a company’s stock, investors need to learn about the sector and industry the company operates in, its business model, its earnings persistence, its capacity to generate cash flows, and last but probably most important, its valuation.

It is the interaction between the fundamentals and the market valuation that determines the future returns and risk of a stock, not its past price volatility.

Perhaps this concept is best illustrated by two of the most important investing principles of Benjamin Graham – margin of safety and view of volatility as an opportunity.<sup>3</sup> Margin of safety is the principle of buying a security at a significant discount to its intrinsic value, this will not only provide high-return opportunities, but will also minimize the downside risk of an investment. The margin of safety protects the investor from both poor decisions and downturns in the market. According to Graham, investors can profit from volatility. Short-term volatility will always be part of the market, but to take full advantage of that volatility, it is important to understand that over time, the market always returns to its appropriate level. “In the short run, the market is a voting machine but in the long run it is a weighing machine.” Warren Buffet, Graham’s most successful disciple and one of the greatest investors of all time has also an unfavorable view of price volatility and beta as measure of risk. In his 1993 letter to shareholders he wrote<sup>4</sup>: “...Academics, however, like to define investment “risk” differently, averring that it is the relative volatility of a stock or portfolio of stocks - that is, their volatility as compared to that of a large universe of stocks... For owners of a business - and that's the way we think of shareholders – the

academics' definition of risk is far off the mark, so much so that it produces absurdities. For example, under beta-based theory, a stock that has dropped very sharply compared to the market - as had the Washington Post when we bought it in 1973 - becomes “riskier” at the lower price than it was at the higher price. Would that description have then made any sense to someone who was offered the entire company at a vastly-reduced price? In fact, the true investor welcomes volatility ... a wildly fluctuating market means that irrationally low prices will periodically be attached to solid businesses. It is impossible to see how the availability of such prices can be thought of as increasing the hazards for an investor who is totally free to either ignore the market or exploit its folly.”...In assessing risk, a beta purist will disdain examining what a company produces, what its competitors are doing, or how much borrowed money the business employs. He may even prefer not to know the company's name. What he treasures is the price history of its stock. In contrast, we'll happily forgo knowing the price history and instead will seek whatever information will further our understanding of the company's business.” The “fundamentalist view” so well captured by Graham and Buffet’s investment philosophy is rational and understandable. This stands in contrast to the “statistical volatility view” which lacks a credible, intuitive explanation that links stocks’ fundamentals with their return and volatility patterns. To be sure, currently there are even four competing explanations for the existence of the low volatility effect.<sup>5</sup> It is emblematic that these four explanations are called “hypothesis” or “theories”. It highlights the fact that there is not clear understanding of why low volatility stocks have historically performed well on a risk-adjusted basis. Low volatility strategies should function as risk management tools to help remove uncertainty from portfolio returns, but ironically, there is considerable uncertainty about what drives the low volatility effect itself.

Ultimately, if we accept that risk is not the same as volatility, we must also question any portfolio strategy that relies on this view.

<sup>3</sup> See for example Chapter 8 and Chapter 20 of *The Intelligent Investor*, by Benjamin Graham.

<sup>4</sup> <http://www.berkshirehathaway.com/letters/1993.html>

<sup>5</sup> Well-summarized in: Jason Hsu and Feifei Li, “Low-Volatility Investing”, *The Journal of Index Investing*, Vol. 4, No.2, Fall 2013.

## 5. The SmartALPHA™ Defensive Strategy Indexes

### Defining Risk

The starting point of a defensive strategy - like any equity strategy - should be the investor’s standpoint. From the investor point of view there are three *distinct yet interrelated* risks:

1. Prolonged drawdowns (a bear market, typically related to the business cycle);
2. Sharp market drops (unexpected market events, shocks, black swans);
3. Inability to preserve and grow capital over the investment horizon. Over time, sudden losses and deep drawdowns may impair the ability to preserve and grow wealth.

If the goal is to maximize long-term growth through mitigating steep drawdown, it follows logically that a defensive equity strategy should provide protection in down markets, while at the same time offering adequate upside participation. By protecting in down markets and participating in up markets, a defensive strategy will help investors reaching their ultimate goal of preserving and growing wealth over their investment horizon.

The second step is to define and quantify equity risk from a portfolio management standpoint so that we can develop a strategy with the objective of mitigating that risk. From a portfolio manager’s standpoint, stock price volatility is a manifestation of fundamental risk. In turn, fundamental risk has two main components: macro and company-specific risk.

### Macro Risk

This risk is related to the overall economy and the business cycle and affect all stocks.

Specifically:

- a) The largest capital losses and drawdowns are typical of economic contractions and recessions.
- b) Unexpected and unpredictable events that affect the economy such as geopolitical events or a shock in the supply of basic commodities like oil.

### Company-Specific Risk

This risk is inherent to individual stocks and has three components:

1. Earnings Persistence: a decline in earnings power reduces the equity value;
2. Distress: high debt leverage constrains growth and may result in bankruptcy;
3. Valuation: stocks trading at high multiples are riskier and tend to underperform.

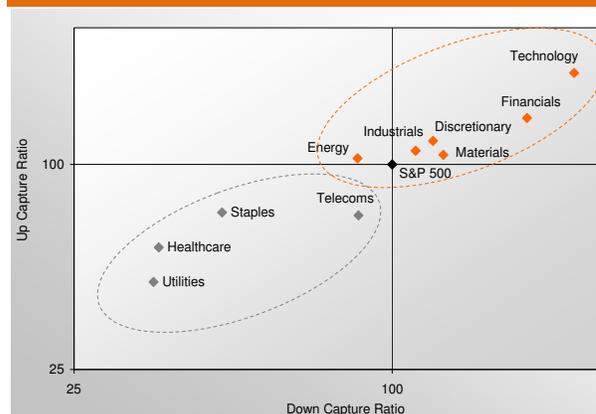
### Strategy Development

Now that we have identified the risks associated with equity investing, we can develop a defensive equity strategy with the goal of mitigating those risks.

### Top-Down Dimension: Macro Risk

The largest non company specific determinant of equity volatility and returns is the sector in which a company operates. This makes intuitive sense as stocks belonging to the same economic sector will tend to be affected by the same economic, regulatory and technology forces. In addition, some sectors have similar sensitivity to the economic environment. For example, consumer staples and health care firms—two defensive sectors— are less dependent on the rate of economic growth than cyclical sectors such as industrials and consumer cyclicals. Defensive sectors display consistently low volatility and offer cushion during down markets (see Figure 2).

Figure 2. Up/Down Capture Ratio (1990-2014)



Source: Morningstar Direct, Crest Investment Partners

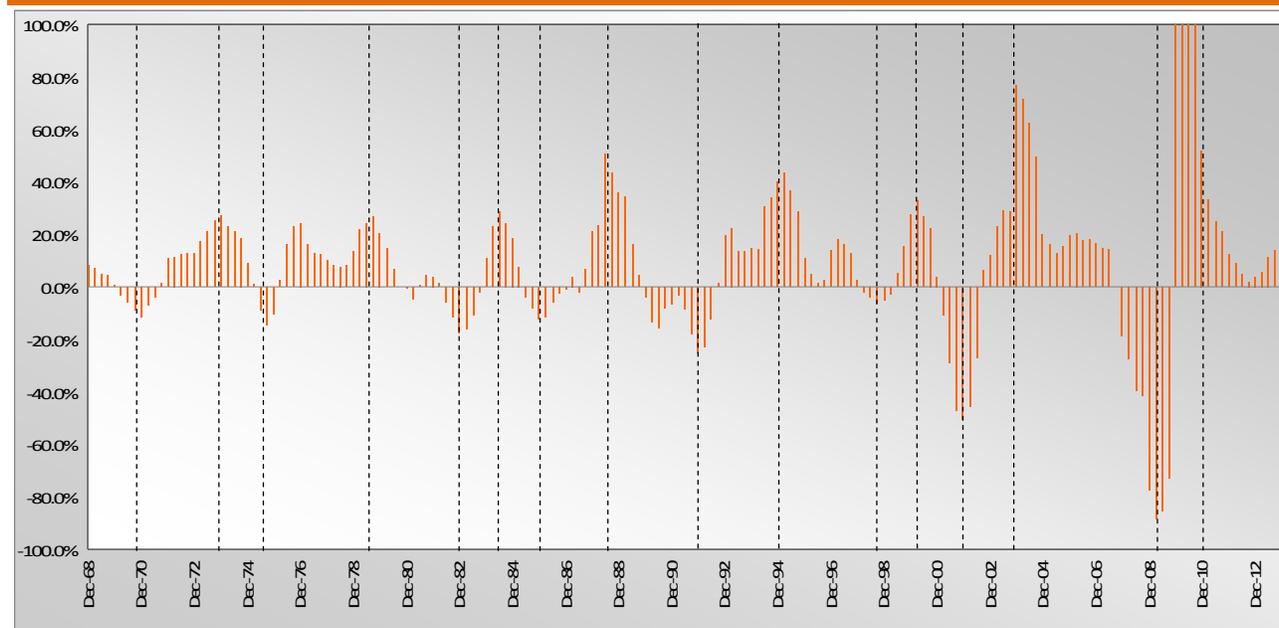
### Earnings Cycle and Sector Performance

Historically, non-cyclical, defensive sectors have consistently provided protection in down markets. This makes sense, as there is an economically intuitive link between the business cycle and the performance of cyclical and defensive sectors. During periods of economic expansion, cyclical stocks tend to perform best as their growth is leveraged to the economy. However, as the business cycle peaks and the economy starts to contract, defensive stocks offer downside protection due to their resilience and lower sensitivity to the business cycle. This relationship between the business cycle and the performance of cyclical and defensive sectors has been very consistent over the last several decades. Chart 3 depicts the earnings cycle – the year-over-year change in the aggregate earnings of the S&P 500 companies. In the table, the average monthly return of cyclical and defensive sector groupings is calculated separately for

contraction and expansion periods. Expansion is defined as trough-to-peak and contraction is defined as peak-to-trough in the earnings cycle. Over the period under study, there were eight contractions. In seven instances out of eight, the defensive sector portfolio outperformed the cyclical sector portfolio. The average outperformance was an economically significant 70 bps per month.

It turns out that available low volatility products can be deconstructed as unintentional defensive sector strategies as their sector composition is dominated by utilities, staples and health care sectors. Supported by empirical evidence, we advocate an approach that selects stocks exclusively from defensive sectors as a more deliberate and economically sensible way to build a defensive strategy more resilient to economic recessions and less exposed to downside volatility.

Figure 3. Earnings Cycle and Performance of Cyclical and Defensive Sectors



Average Monthly Returns									
Expansions	Mos	S&P 500	Cyclical Sectors	Defensive Sectors	Contractions	Mos	S&P 500	Cyclical Sectors	Defensive Sectors
12/70-12/73	36	0.4	0.4	0.5	12/73-9/75	21	(0.3)	(0.5)	(0.2)
9/75-12/79	51	1.1	1.3	0.9	12/79-12/82	36	1.5	1.4	1.8
12/82-6/84	18	0.9	0.9	0.7	6/84-12/85	18	2.6	2.5	3.4
12/85-12/88	36	1.3	1.0	1.7	12/88-12/91	36	1.8	1.2	2.9
12/91-3/95	39	0.8	1.2	0.4	3/95-9/98	42	2.8	2.5	3.1
9/98-3/00	15	3.3	3.8	0.7	3/00-12/01	21	(1.0)	(0.5)	0.1
12/01-12/03	24	0.0	0.3	(0.4)	12/03-3/09	63	(0.3)	(0.2)	0.2
3/09-12/10	21	3.0	3.9	1.8	12/10-9/12	21	0.9	0.6	1.4
<b>Average</b>	<b>30.0</b>	<b>1.4%</b>	<b>1.6%</b>	<b>0.8%</b>	<b>Average</b>	<b>32.3</b>	<b>1.0%</b>	<b>0.9%</b>	<b>1.6%</b>

Source: S&P Capital IQ, Crest Investment Partners

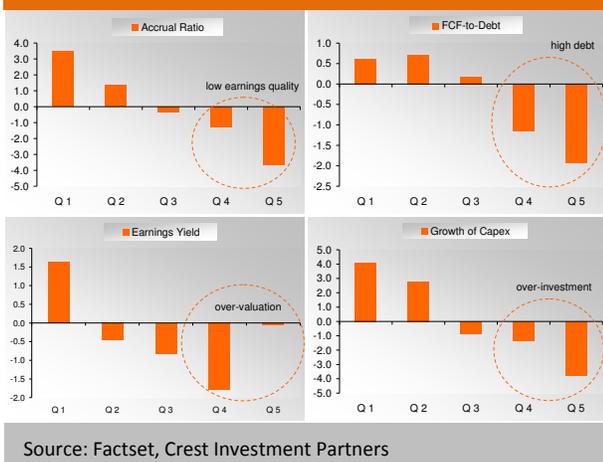
**Bottom-Up Dimension: Firm-Level Risk**

From a bottom-up standpoint, it is our stock selection process that enables us to manage the company-specific risks. Our research shows that stocks with specific fundamental attributes such as low earnings quality, high debt leverage, and high valuation multiples historically have significantly underperformed the market averages.

Figure 4 shows some of this evidence over the 1990-2014 period. The charts report the excess returns of selected factor portfolios versus the universe average. For example, the stocks in the bottom quintile (quintile 5) by accrual ratio (companies with low quality of earnings as measured by high accruals and low cash flows) underperformed the market average by over 300 basis points per year over the period under study. Conversely, stocks in the top quintile (quintile 1) by earnings quality outperformed by over 300 basis points. A similar return pattern is observed for the other three factors: Companies with high (low) debt-to-cash flow, high (low) reinvestment rates and low (high) earnings yield, under (out)-performed significantly over the same period.

The economic and statistical significance of these factor returns and the consistency and magnitude of their top-bottom quintile return spreads cannot be ignored.<sup>6</sup>

Figure 4. Selected Factor Quintile Portfolios



We leverage this empirical evidence and fundamental insight into our investment process by selecting stocks based on fundamental and valuation factors that our research has found to be predictive of returns and risk. Figure 5 summarizes the types of risks equity investing entails, how they manifest themselves, and how they are mitigated in the SmartALPHA™ Defensive Strategy Indexes.

Figure 5. Equity Investing Risks

Risk Type	Manifested as	SmartALPHA™ Approach
Macro	Sensitivity to business cycle and economic conditions	Select only non-Cyclical Stocks
Earnings quality	Earnings decline	Select stocks with higher earnings quality
High debt leverage	Distress, bankruptcy	Select stocks with low debt leverage
Overvaluation	High market multiples	Select stocks with attractive valuation multiples

Source: Crest Investment Partners

The flow chart on the next page depicts the investment process that generates the SmartALPHA™ Defensive Strategy Indexes. Starting from a universe of liquid, large and mid cap U.S. equities, select only non-cyclical sectors (consumer non-cyclical, health care, telecom and utilities). These sectors were selected based on their outperformance in down markets, as shown in Figure 3. Thirty stocks are selected for each strategy based on growth and value factors that have displayed strong performance over several cycles and market conditions. Defensive Growth selects stocks with high earnings growth and attractive earnings quality. Defensive Value selects stocks based on cash-flow based valuation, with minimal leverage. Our methodology favors sectors with greater opportunity for higher returns (high factor dispersion). Indexes are reconstituted quarterly and rebalanced annually to equal-weighted. Portfolio constraints are a maximum of 6 stocks per industry and a maximum of 8% per constituent.

<sup>6</sup> The factor portfolios showed in this report are just examples of excess returns to fundamental factors. The SmartALPHA™ Strategy Indexes employ a proprietary multi-factor model that may include these and other refined factors in combination.

Figure 6. Investment Process of the SmartALPHA™ Defensive Strategy Indexes



Source: Crest Investment Partners

## 7. Risk and Return Analysis

### Backtest Period

How does our methodology work? We will answer this question in this and the next section where we report and analyze both the simulated and live performance of the SmartALPHA™ Defensive Strategy Indexes versus other available low volatility products and the overall market. Figure 7 reports the simulated (back-tested) performance statistics of the SmartALPHA™ Defensive Strategy Indexes for the 01/1991-06/2012 period.<sup>7</sup>

Figure 7. Risk and Return Analysis (1/1991-6/2012)

	SmartALPHA™ Defensive Value	SmartALPHA™ Defensive Growth	S&P 500
Return	15.87	13.56	9.04
Standard Deviation	12.97	12.50	15.04
Sharpe Ratio	0.97	0.82	0.38
Tracking Error	10.14	9.96	0.00
Alpha	8.16	6.18	0.00
Beta	0.64	0.62	1.00
Information Ratio	0.67	0.45	—
Max Drawdown	-33.28	-33.46	-50.95
Recovery # of Months	12	22	37
Down Capture Return	-1.71	-1.96	-3.77
Up Capture Return	2.91	2.78	3.30

Source: Morningstar Direct, Crest Investment Partners

Over the historical simulation period, the SmartALPHA™ Defensive Value and Defensive Growth indexes outperformed the S&P 500 Index by 680 and 450 basis points per year, respectively.

As a result of our defensive sector focus and active approach to portfolio construction, the SmartALPHA™ Defensive Indexes exhibit a significant tracking error versus the S&P 500.

More importantly, the two indexes display strong risk-adjusted performance with significant, positive alpha of 816 bps and 618 bps per year over the S&P 500 index, for the Defensive Value and Defensive Growth, respectively.

As an alternative view of the sensitivity of portfolio performance to different states of the market, we analyze the variation in performance across the strategies in different market regimes. In down markets - defined as months when the S&P 500 had a negative return - the Defensive Value and Defensive Growth indexes show an average monthly returns of -1.71% and -1.96%, respectively versus -3.77% for the S&P 500.

The maximum drawdown of the defensive strategy indexes is also significantly better with a decline from peak to trough of only 33% versus 51% for the S&P 500. The number of months to full recovery is also dramatically shorter with only 12 months for the Defensive Value index and 22 months for the Defensive Growth index, versus 37 months for the S&P 500.

In up markets the Defensive Value and Defensive Growth indexes show a respectable average monthly returns of 2.91% and 2.78%, respectively versus 3.30% for the S&P 500.

This asymmetric behavior of the SmartALPHA™ defensive indexes in up and down markets, results in strong risk adjusted performance, and in the long-term, contributes substantially to capital growth.

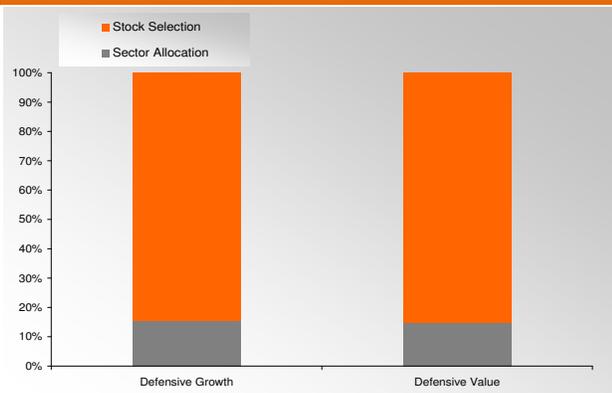
In the next section we will break down the drivers of performance via attribution analysis – a technique that allows to separate the total portfolio returns into sector allocation and stock selection effects.

<sup>7</sup> Performance shown includes simulated, or backtested, history. Performance prior to 6/29/2012 is based on a quantitative, rules based backtest. Index performance does not represent the returns of any advisory client and are presented without the deduction of advisory fees, trading costs, or other expenses. Please see disclosure on last page for details on the limitations of backtested history.

### Return Attribution Analysis

Attribution analysis distinguishes which of the two factors of portfolio performance, superior stock selection or superior market timing (sector allocation in this case), is the source of the portfolio’s performance. Figure 8 shows the sector allocation and stock selection effects of the historically simulated strategies. For both the Defensive Growth and Defensive Value strategy indexes, stock selection represents about 85% of their total return with the remaining 15% accounted by sector allocation.

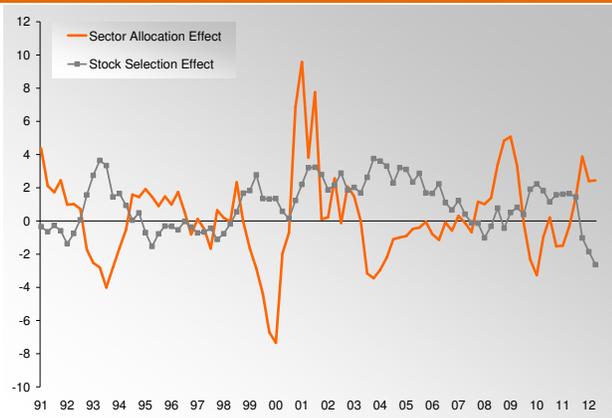
Figure 8. Performance Attribution (1/1991-6/2012)



Source: Factset PA, Crest Investment Partners

This analysis confirms that the SmartALPHA™ Defensive indexes are alpha-factor driven indexes systematically delivering above market returns through focused stock selection.

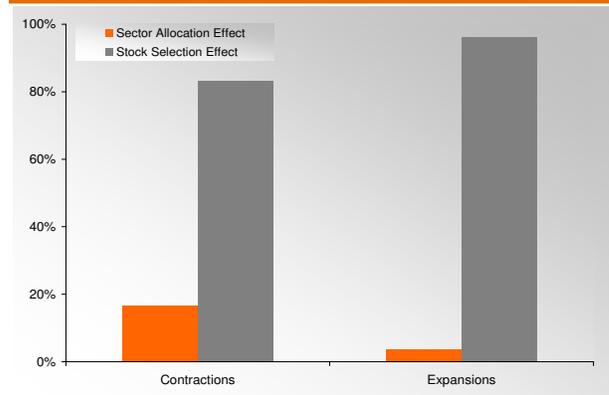
Figure 9. SmartALPHA™ Defensive Blend Performance Attribution 4-quarter Rolling



Source: Factset PA, Crest Investment Partners

Figure 9 displays portfolio attribution effects over time. The negative correlation between the two lines is visually apparent. In fact, the correlation between sector allocation and stock selection over the simulated history is -0.30. This suggests that our index construction process that controls risk by sector allocation and targets high returns via stock selection works in the intended way. This is confirmed by Figure 10 where we report the average sector allocation and stock selection effects in two different corporate earnings regimes: contractions and expansions.<sup>8</sup>

Figure 10. Attribution in Different Regimes



Source: Factset PA, Crest Investment Partners

Figure 10 shows that during periods of aggregate corporate earnings contraction, the SmartALPHA™ Defensive Blend Strategy benefits its exposure to non-cyclical, defensive sectors. During periods of earnings expansion the strategy’s returns are almost exclusively driven by stock selection, as its concentration in defensive sectors only adds value marginally. In sum, the attribution analysis reported in this section corroborates *ex-post* what we envisioned *ex-ante*: a defensive strategy can be built without sacrificing long-term performance by targeting contemporaneously high returns and low volatility through a systematic process that selects defensive stocks with high expected alpha.

As we show in the next section, this fundamental approach achieves below market volatility and low beta in line with the statistical volatility indexes, ultimately achieving a mitigated drawdown. Yet our fundamental approach also adds value through upside participation resulting in significantly stronger absolute and risk-adjusted cumulative returns.

<sup>8</sup> Contractions and recessions are defined in the same way as on the analysis on page 5.

## 8. Risk and Return Analysis – Comparison with Other Low Volatility Strategies

Figure 11 reports the performance statistics of the SmartALPHA™ Defensive Strategy Indexes vis-à-vis other currently available low volatility strategy indexes. We also report the equal-weighted blended composite of the two individual defensive indexes (SmartALPHA™ Defensive Blend).

While the volatility (standard deviation) of the SmartALPHA™ strategies is slightly higher than the other low volatility strategies, their Sharpe ratio is much higher. This is the result of a considerably higher compounded average return (13.60% for the SmartALPHA blend vs. 8.66%, 7.84% and 8.13% for the S&P, MSCI and Russell indexes, respectively). The average monthly return in up and down markets in Figure 11 reveals that this superior performance is achieved through a combination of strong downside cushion and

remarkable (for a defensive strategy) upside participation. This asymmetrical return pattern is unique to the SmartALPHA™ Defensive Strategy Indexes and results in a very attractive performance profile characterized by strong returns, lower volatility and contained drawdown. The statistical low volatility strategy indexes offer some cushion in down markets, but tend to lag significantly during up markets.

The attractive return profile of the SmartALPHA™ Indexes is the direct result of our index construction methodology that draws exclusively from defensive sectors and select stocks based on “alpha-factors” – firm-specific fundamental and valuation attributes related to future risk and return. Thus, during periods of economic contractions and stock market weakness, the defensive nature of non-cyclical sectors provide downside cushion; during economic recoveries and strong up markets, the bottom-up stock selection provide opportunities for strong returns.

Figure 11. Risk and Return Analysis (2/1/2005-9/30/2014)

	SmartALPHA™ Defensive Value	SmartALPHA™ Defensive Growth	SmartALPHA™ Defensive Blend	S&P Low Volatility	MSCI USA Minimum Volatility	Russell 1000 Low Volatility	S&P 500
Return	14.44	12.67	13.60	8.66	7.84	8.13	7.69
Standard Deviation	12.67	11.99	12.01	10.62	11.69	11.39	14.86
Sharpe Ratio	1.02	0.93	1.00	0.67	0.54	0.58	0.41
Tracking Error	7.78	8.43	7.62	7.69	5.70	5.32	0.00
Alpha	7.73	6.51	7.12	3.00	1.57	1.84	0.00
Beta	0.73	0.67	0.70	0.62	0.74	0.73	1.00
Information Ratio	0.87	0.59	0.78	0.13	0.03	0.08	—
Max Drawdown	-33.28	-33.46	-32.51	-35.36	-41.59	-36.70	-50.95
Recovery # of Months	12.00	22.00	13.00	22.00	26.00	24.00	37.00
Down Capture Return	-2.22	-2.20	-2.21	-2.19	-2.67	-2.79	-3.94
Up Capture Return	2.87	2.66	2.77	2.19	2.34	2.44	3.01

Source: Morningstar Direct

## 9. Performance Since Live Calculation

The SmartALPHA™ Strategy Indexes went “live” on June 29, 2012. Although the live performance period reported here is only 27 months, it is insightful to analyze the strategies’ behavior in relation to their historical, simulated performance, the business cycle, and vis-à-vis other low volatility strategies.

Figure 12 reports risk and return metrics for the SmartALPHA™ Strategy Indexes, the S&P 500 Index and other selected low volatility indexes.

The magnitude of the out-performance of the SmartALPHA™ Defensive Strategy Indexes over both the S&P 500 and the other low volatility strategies is striking. Over the period under analysis, the SmartALPHA™ Defensive Value and Growth Indexes have out-performed the S&P 500 Index by about 600 bps and 700 bps per year, respectively. The out-performance of the SmartALPHA™ Defensive Indexes over the other low volatility indexes is over 10% per year. Even after adjusting for risk, the SmartALPHA™ Defensive Indexes generated large positive alphas of 500-600 bps per year over the S&P 500.

Such high alpha in conjunction with a tracking error of about 600 bps, resulted in an information ratio of one. These results are consistent with our historical simulation which shows that during economic expansions, the SmartALPHA™ Defensive Strategies keep up with the market despite their defensive sector composition.

The performance of the other low volatility strategies over the period under study highlights the limitation of stock price volatility as the main driver of portfolio construction and reveals the “double-edged sword” character of volatility: in up markets volatility is desirable as it magnifies portfolio returns.

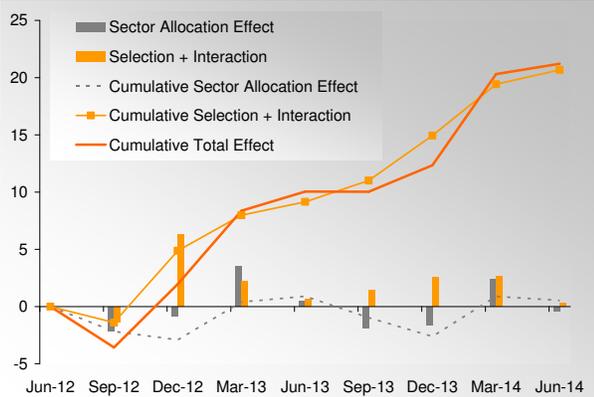
The live performance of the SmartALPHA™ Defensive Indexes supports our original intuition that during economic recoveries and rising markets, favorable portfolio performance can still be achieved through focusing on defensive stocks with an attractive fundamental and valuation profiles.

Figure 12. Risk and Return Analysis Live Index Calculation (7/1/2012-9/30/2014)

	SmartALPHA™ Defensive Value	SmartALPHA™ Defensive Growth	SmartALPHA™ Defensive Blend	S&P Low Volatility	MSCI USA Minimum Volatility	Russell 1000 Low Volatility	S&P 500
Return	26.15	25.75	25.95	14.51	14.36	17.67	20.44
Standard Deviation	9.62	10.88	9.92	9.29	8.32	8.35	8.28
Sharpe Ratio	2.71	2.36	2.61	1.55	1.72	2.11	2.46
Tracking Error	4.97	7.22	5.59	6.07	4.58	3.75	0.00
Alpha	4.91	4.93	4.88	-2.39	-2.43	-0.58	0.00
Beta	1.00	0.98	0.99	0.86	0.85	0.91	1.00
Information Ratio	1.15	0.73	0.98	-0.98	-1.33	-0.74	—

Source: Morningstar Direct

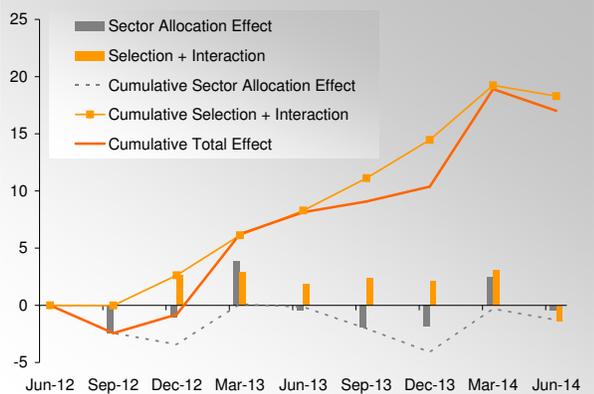
Figure 13. Attribution Analysis: SmartALPHA™ Defensive Growth Strategy Index



Source: Factset PA, Crest Investment Partners

Figure 13 and 14 show the portfolio attribution effects for the live performance of the indexes. It clearly illustrates that the SmartALPHA™ Defensive Indexes have generated alpha entirely by stock selection. This is in line with the simulated historical performance that shows that during rising markets, stock selection drives performance of the SmartALPHA™ Defensive Indexes.

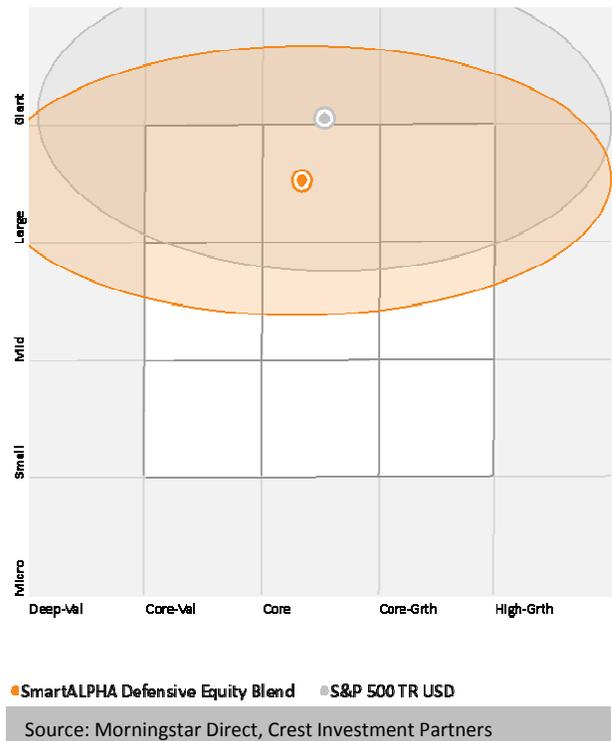
Figure 14. Attribution Analysis: SmartALPHA™ Defensive Value Strategy Index



Source: Factset PA, Crest Investment Partners

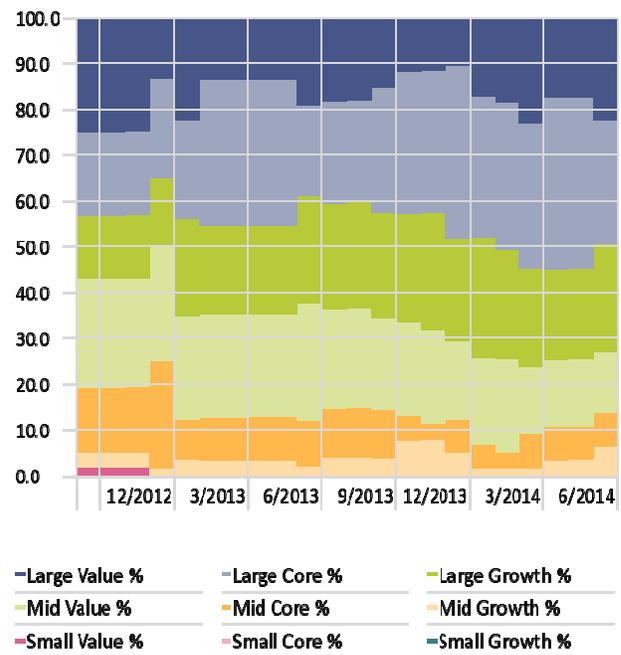
Figure 15 and Figure 16 show that the SmartALPHA™ Defensive Blend is mostly composed of large caps with a slight tilt towards midcap and value stocks vis-à-vis the S&P 500. This is not surprising as our investment process selects large and midcap stocks with favorable valuation and growth attributes.

Figure 15. Holdings-Based Style Map: SmartALPHA™ Defensive Strategy Blend



Source: Morningstar Direct, Crest Investment Partners

Figure 16. Trailing Holding-Based Style Exposures: SmartALPHA™ Defensive Strategy Blend



Source: Morningstar Direct, Crest Investment Partners

## 10. Conclusion

Currently available low volatility strategies and indexes are mainly driven by past volatility of stock prices and do not target or maximize returns. As a result, these statistical low volatility strategies don't keep up with rising markets typically associated with economic rebounds and expansions. This lack of upside participation impairs their ability to maximize return potential.

The SmartALPHA™ Defensive Indexes target contemporaneously high returns and low volatility through a systematic process that selects defensive stocks with high expected alpha. The indexes are fundamentally-based defensive equity strategies that attempt to shield investors from macro- and company-specific risks in order to mitigate downside risk, similar to the statistical low-volatility indexes, yet at the same time offer strong upside market participation.

The SmartALPHA™ Defensive indexes' sector selection focuses exclusively on non-cyclical stocks reflecting the historically consistent resiliency of defensive sectors during market downturns and economic recessions. If risk is defined in absolute terms of capital loss, rather than benchmark relative tracking error, this is an empirically proven and economically sound approach.

Layering on this economic sector focus; our stock selection is based on refined fundamental and valuation factors that have demonstrated consistent excess returns over different market regimes and economic cycles.

The SmartALPHA™ Defensive Index approach of systematically structuring indexes based on macro risk determinants combined with alpha-factor stock selection delivers on both goals of mitigating downside risk and maximizing returns, on absolute and risk-adjusted basis. It is intuitive, rooted in fundamental analysis, and generates an asymmetrical return pattern with strong downside protection and remarkable upside participation.



Massimo Santicchia is a co-founder and Chief Investment Officer of Crest Investment Partners. He directs the investment strategy as well as develops and manages quantitative equity strategies. Mr. Santicchia has 18 years of investment experience including: S&P Investment Advisory Services LLC, as creator and portfolio manager of the JNL/S&P 4 funds and co-manager of the JNL/S&P Managed and Disciplined funds. Mr. Santicchia holds an M.B.A. from Alliant International University, San Diego and a M.S. in Investment Management from Pace University, New York.

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Katherine Gallagher is a co-founder and Senior Portfolio Manager of Crest Investment Partners LLC. She designs and manages multi-asset portfolios comprising mutual funds, ETFs, and alternative strategies. Ms. Gallagher has 13 years investment experience, including leading the manager research team at S&P Investment Advisory Services LLC, and managing multi-asset UMA model portfolios with a 6+ year track record. Previous experience at S&P includes monitoring and analyzing money, bond fund, and government investment pool ratings. Ms. Gallagher holds a B.S., Fordham University College of Business Administration.

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