



## Lee Adaptive Large Cap Sector Update

### Monthly Commentary

May 2017

May brought another tidy rise in equity markets, with the S&P 500 Total Return Index up +1.41%<sup>1</sup>, its seventh consecutive monthly gain. For May, the Lee Adaptive Large Cap Sector Composite ("LALCS Composite"), on a net of fee basis, was up an estimated +1.24%. For more detail, please see the performance discussion below.

Once again, the big news in the equity markets was how little news there was. With the exception of a few hours during the morning of May 17<sup>th</sup>, the market spent the month in its recent utopian state of very low volatility combined with a gentle updraft of about a percent per month.

Somewhat surprisingly, the reaction of most investors to the current market is not joy, relief, or even greed. It is a sense of foreboding, a worry that others are not worried enough, and, more than anything else, confusion. Why is volatility so low now? What does it mean?

Last month we discussed one reason why the stock market might be less exciting today than in previous years. Today's public companies are bigger and duller than the public companies of a generation ago. But, although that may help explain why this decade is different from last decade, it does little to explain why 2017 is so different from 2016 or 2015.

The best explanation may be the obvious one, the simple happenstance that there have been few investing surprises lately. But there have been similarly quiet news periods in the past. Why is the market experiencing multi-generational lows in volatility now? Another piece of the puzzle may be a little appreciated financial feedback loop.

It is a story that starts with the widely misunderstood VIX index. The VIX is, essentially, based on the price of a basket of options, both call and put, on the S&P 500. A long position in VIX is a bet that the market will be volatile, that is, that it will go up or down by enough to make the value of the basket of options increase.

The VIX is sometimes explained as the price of insurance against market volatility. That is a reasonable metaphor, but it is misleading in one important respect. No matter how much flood insurance you buy (or how much you sell) the chances of a flood occurring remain the same. Financial markets rarely work that way.

A few years ago, there was a short-lived vogue for going long the VIX as a hedge for equity exposure. If the markets went down sharply, it was reasoned, the VIX would go up as a counterbalance. It is a strategy that would have worked very nicely in 2008-09.

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<sup>1</sup> Source: FactSet®

The vogue was short-lived because it was soon discovered that even when thought of as an insurance policy, the VIX is an outstandingly horrible investment. How horrible? Consider perhaps the easiest way that an ordinary investor can go long the VIX, the iPath S&P 500 VIX ETN (ticker VXX). When it launched on January 30, 2009, it closed, *on a split-adjusted basis*, at \$26,772 a share. It currently trades around \$13.50, for a cumulative return of -99.95%.

If you are like most investors, the first thing that popped into your head when you learned that VXX was now worth about one two thousandth of what it was eight years ago was “can I go short?” And of course you can. You can short VXX, there are short VIX ETNs, VIX futures, or, if you are traditionally minded, you can just short (i.e. write) options on the S&P 500.

We believe that in various shapes and forms writing S&P 500 options has become a popular strategy in the past few years. Naturally, all those options flooding into the market drives down prices, which drives down the VIX, further confirming the brilliance of the strategy. It might be imagined that this self-reinforcing folly would be contained within the options and futures markets. Alas, the financial world is interconnected, and those connections are usually bi-directional.

There is no obvious natural buyer for a wave of newly written S&P 500 options. But if the VIX stays above the actual realized volatility of the S&P 500 (and it generally does) then there is a fairly reliable way for an investment bank with capital and computers to make money buying the options. It involves what is known as delta hedging.

Basically, a bank goes long a call option and hedges its position by shorting a certain amount of the underlying security, in this case S&P 500 futures. On the put side, it hedges by going long some S&P 500. Just how much of the underlying the bank needs to take on to hedge its option position is called delta. It is a ratio calculated using complicated math, but there are really only two things to understand about it. First, it increases as the value of the option it is hedging increases, so if the S&P rises, making the call options increase in value, the delta increases, meaning that the hedging short position needs to get bigger. Second, it pays to recalculate delta, and adjust your positions, as often as possible, for example by having a computer do it for you instantly on every tick.

So here is how this works. Imagine the S&P goes up +0.10% one morning. The computers calculate that the value of S&P calls has increased, so the delta is now larger, so the hedge is adjusted by shorting a little more S&P. Also, the value of the puts is now lower, so the delta on that side is smaller and the computer sells a little of the long S&P position that hedges the put options. Note that on both sides it is selling in reaction to a rising market. And if the S&P goes down -0.10%? The call hedge needs to shrink, meaning the computer will buy to reduce the short S&P exposure, and the put hedge needs to grow, so the computer will buy to increase the long exposure.

The end result is that a lot of cheap S&P options means a lot of hedging investment banks that will sell into even slightly rising markets and buy into slightly falling ones. Which dampens down price movements, lowering volatility, which lowers VIX, which encourages even more selling of options, which leads to more delta hedging, which further dampens price movements.

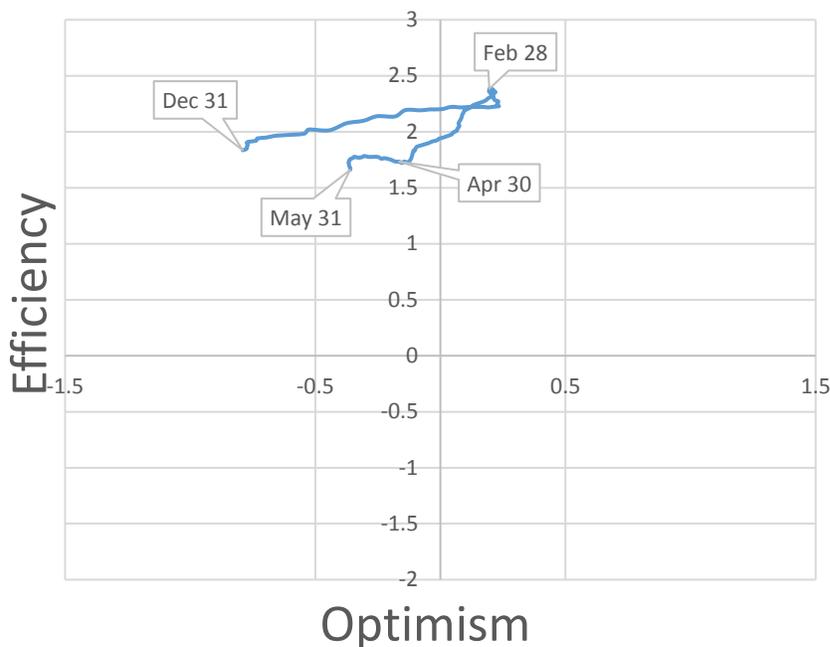
How does this all end? Probably badly. There must be a practical lower bound for VIX. It certainly cannot be negative. Moreover, eventually there will be some bit of significant news that will move the market suddenly by a few percent. That will increase VIX, which will reduce enthusiasm for shorting it. The self-

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reinforcing cycle could then run in reverse, as a decreased supply of cheap S&P options decreases the delta hedging activity, reducing the dampening effect, and increasing volatility and VIX further.

### The Market Sentiment Framework

We use our Market Sentiment Framework to adapt the mechanics and weightings of our full quantitative model to changing market conditions. The Sentiment Framework gauges the current state of market psychology on two dimensions. Efficiency measures the crowdedness of the market, the volume of participants seeking investment opportunities. Lower levels of efficiency imply more market mispricing. Optimism measures the willingness of investors to take on risk in exchange for distant and uncertain rewards. Higher levels of optimism imply a better outlook for risky asset classes.



After falling during the closing weeks of 2016, Optimism gained ground through the first two months of 2017. Since then it has more gradually retreated, giving up about half its gain for the year, to end May at a neutral to modestly negative level.

In contrast, Efficiency has been largely stable, maintaining its high level for more than a year.

The current positioning of the Sentiment Framework implies a

market that is crowded and efficient, with few opportunities for easy relative gains from stock picking. Optimism, although somewhat improved relative to the past few years, is in the context of a longer history at a slightly below neutral level, a place that implies neither optimism nor pessimism, but possibly anxiety.

### Performance

For the month of May 2017, the LALCS Composite, on a net of fee basis, was up an estimated +1.24%, in line with the S&P 500 Total Return Index, which was up +1.41%<sup>1</sup>. For the year to date, the composite has gained an estimated +7.63%, net of fees as against +8.66%<sup>1</sup> for the S&P 500 Total Return Index. The strategy was fully invested in all sectors for the entire month.

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<sup>1</sup> Source: FactSet®

## **Definitions:**

**Lee Adaptive Large Cap Sector Composite ("LALCS Composite").** A capital weighted performance composite of an investment strategy known as the Lee Adaptive Large Cap Sector strategy (the "Strategy") that holds some combination of the U.S. large cap sector ETFs and/or cash, as determined by a proprietary quantitative model. The Strategy is currently offered by LCM to certain qualified investors through (i) a single account which is a component of the overall strategy offered through the private fund Lee Diversified Opportunities Fund LP ("LDOF"), during the period commencing on December 18, 2015 through July 1, 2016 and (ii) the private fund Lee Adaptive Strategies LP ("LAS"), during the period commencing on June 1, 2016 through current. Both LDOF and LAS use the same investment program as the Strategy. The LALCS Composite performance is based on actual trading profits/losses/expenses net of a management fee of 0.50%. Actual expenses of operating the Strategy may vary, depending on the investment structure in which the Strategy is used, which could result in lower returns than those stated for the LALCS Composite. Such expenses may detract materially from the performance of the Strategy and, consequently, the results shown above may not be fully indicative of the actual performance results of the Strategy.

The LALCS Composite is being shown for illustration purposes only and should not be relied upon. No representations or assurance is made that any investor will or is likely to achieve results comparable to those shown above or will make any profit or will be able to avoid incurring substantial losses. PAST PERFORMANCE OF THE STRATEGY AND THE LALCS COMPOSITE ARE NOT INDICATIVE, OR A GUARANTEE, OF FUTURE RESULTS. IT SHOULD NOT BE EXPECTED THAT THE STRATEGY'S ACTUAL RETURNS WILL REPLICATE THE RETURNS SHOWN IN THE PERFORMANCE MODEL.

**S&P 500 Total Returns Index.** The returns for the S&P 500 index on a total return basis, that is, with dividends included and does not reflect the deduction of fees and expenses. You cannot invest directly in this index. The returns for the S&P 500 Index are provided for comparison purposes only to show how the LALCS Composite compares to a broad-based index of securities. The S&P 500 is comprised of a representative sample of 500 large-cap companies. The index is an unmanaged, float-weighted index with each stock's weight in the index in proportion to its float, as determined by Standard & Poors. The index is one of the most widely used benchmarks of U.S. equity performance. The index is not subject to any of the fees or expenses to which the LALCS Composite is subject. It is not possible to invest in this index. The index is used for comparison purposes only. It should not be assumed that the Strategy will invest in any specific securities that comprise the index or that the investment program of the Strategy will track the index. Consequently, the returns of the LALCS Composite may or may not be highly correlated with those of the index.

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