ABR Dynamic Funds' Portfolio Construction Series: Part 20
The value of alternative investments

This installment builds on installment 19 by constructing portfolios with the addition of two more behaviors to the equity behavior ("SPY") and interest rate behavior ("TLT") of installment 19.

We will test several possible complementary investments. The test is simple. Because their purpose will be to complement the equity behavior dominating most portfolios, we will look for investments with low correlations to equity behavior. **The test is *correlation*, not *beta***, in line with underlined installment 13.

| Table 3 Jan 2006 - Jun 2018	Correlation to Equity Behavior - "SPY"
Equity ("SPY")	1.00
Interest Rate ("TLT")	-0.30
Long Volatility	**-0.31**
Managed Futures	**-0.11**
Market Neutral	**0.94**
Long/Short Equity	**0.89**
Option Collar Overlay	**0.93**

Source: ABR White paper (data from Bloomberg)

Based on high correlations to "SPY," in red in the above chart, we reject these market neutral, long/short equity, and option collar overlay "alternatives." For more information on their weaknesses, please see installment 5, installment 2, and installment 11, respectively. More information on the two accepted component behaviors can be found in the Appendix at the end of this installment.

Therefore, we will proceed to construct several portfolios using equity behavior ("SPY"), interest rate behavior ("TLT"), long volatility behavior ("LV"), and managed futures behavior ("MF"). **The principle we will use to construct all of these portfolios is found in installment 19: simply require the maximum possible reward for each dollar put at risk in the portfolio.**

The following graph (Figure 13) mirrors Figure 9 from installment 19. The logic and methodology are found in installment 19 and not repeated in this installment. However, Figure 13 differs from installment 19 in two ways. It includes all 4 of the component behaviors selected above. It also factors in the risk-free rate, meaning the results of leveraged portfolios are shown net of the risk-free rate. The actual cost of leverage would likely be a little bit higher than that, a topic we will cover in a future installment.

As a brief reminder, Figure 13 shows all of the optimal portfolios, on the black line (the "efficient frontier") for investors limited to 100% notional exposure and on the orange line for investors who can use leverage. The optimal blend of the component behaviors, fully invested with no leverage (orange diamond in Figure 13), achieved an annualized return of 6.45% with annualized volatility of just 5.07%:

- 32% "SPY" Allocation
- 17% "TLT" Allocation
- 39% "LV" Allocation
- 12% "MF" Allocation

Fg 13: "SPY"/"TLT"/"LV"/"MF" Historical Efficient Frontier 2006 - Jun 2018
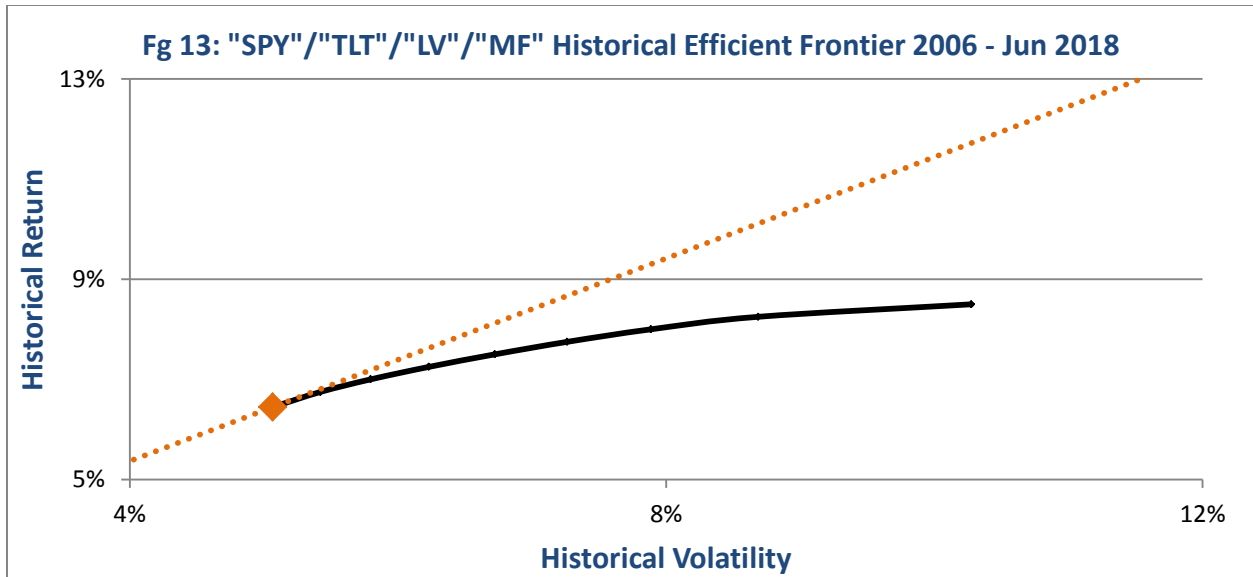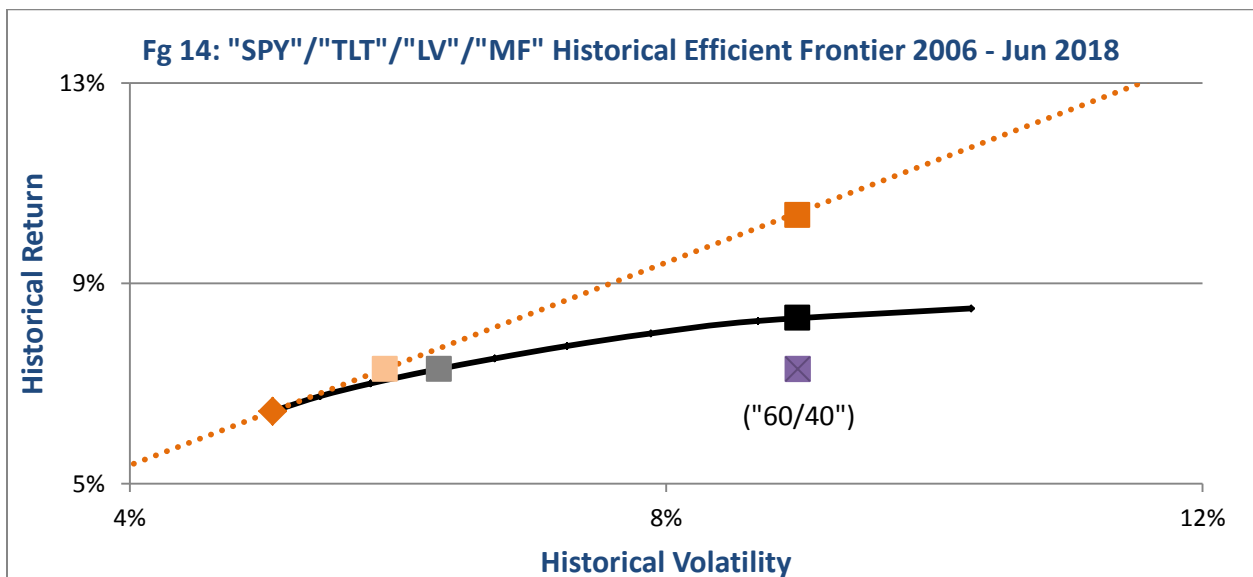
Source: ABR White paper (data from Bloomberg)

The next graph (Figure 14) adds "60/40" (60% S&P 500 plus 40% COREPLUS bonds), as well as four logical comparison points:

1. **Dark-Orange Square**: this portfolio matches the volatility of "60/40" with the highest possible return.
2. **Light-Orange Square**: this portfolio matches the return of "60/40" with the lowest possible volatility.
3. **Black Square**: this portfolio matches the volatility of "60/40" with the highest possible return on the efficient frontier (for investors who cannot use leverage).
4. **Grey Square**: this portfolio matches the return of "60/40" with the lowest possible volatility on the efficient frontier (for investors who cannot use leverage).

As these comparisons reveal, it was possible to significantly reduce the volatility (from 9.0% to 5.9%) and/or increase the return (from 7.3% to 10.4%) of "60/40" over this time frame.

Fg 14: "SPY"/"TLT"/"LV"/"MF" Historical Efficient Frontier 2006 - Jun 2018

("60/40")

Source: ABR White paper (data from Bloomberg)

FOR ILLUSTRATIVE PURPOSES ONLY. CONTAINS NO INVESTMENT ADVICE. PROPERTY OF ABR DYNAMIC FUNDS, LLC.

The following graph and table (Figure 15 and Table 4) show the results and allocations of these 5 portfolios, including "60/40." **The Sharpe ratios and maximum drawdowns are especially noteworthy. These portfolios provided a significantly smoother trip to the same or better results.** We have omitted the unleveraged results from the graph for ease of viewing, but their stats are included in the table. The colors correspond to those in Figure 14.
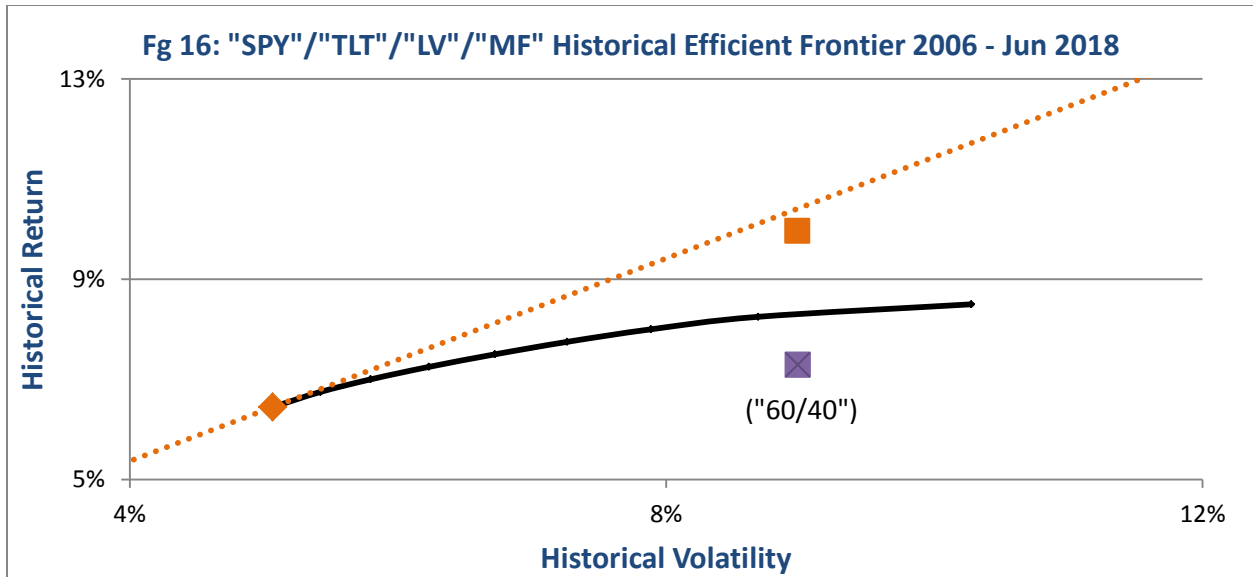

Figure 15: Results from 2006 to Jun 2018
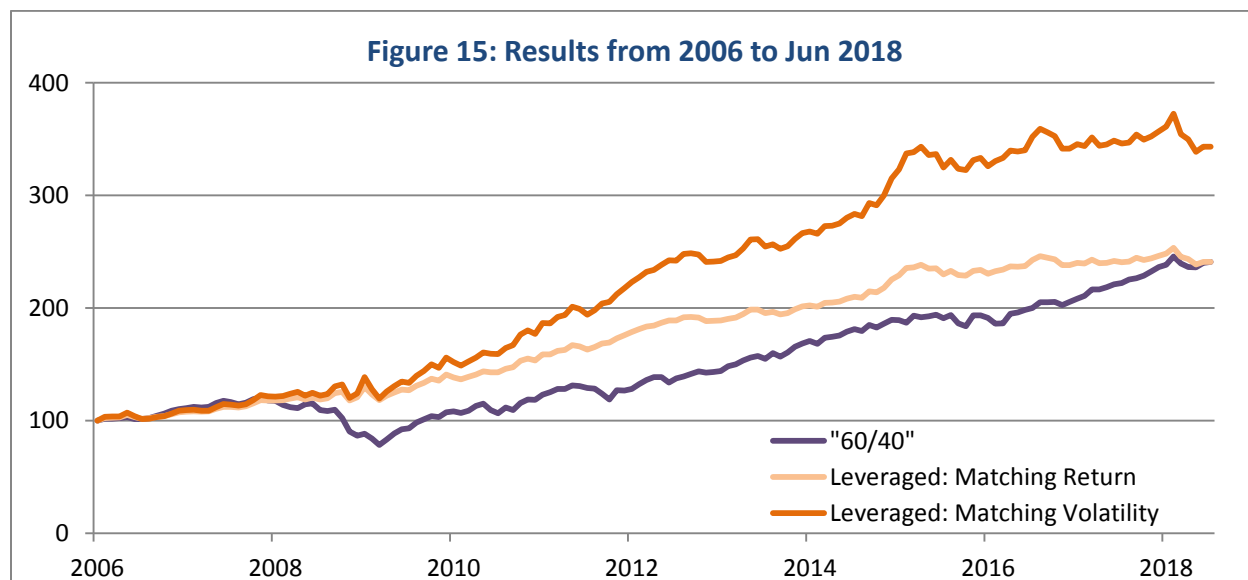
Source: ABR White paper (data from Bloomberg)

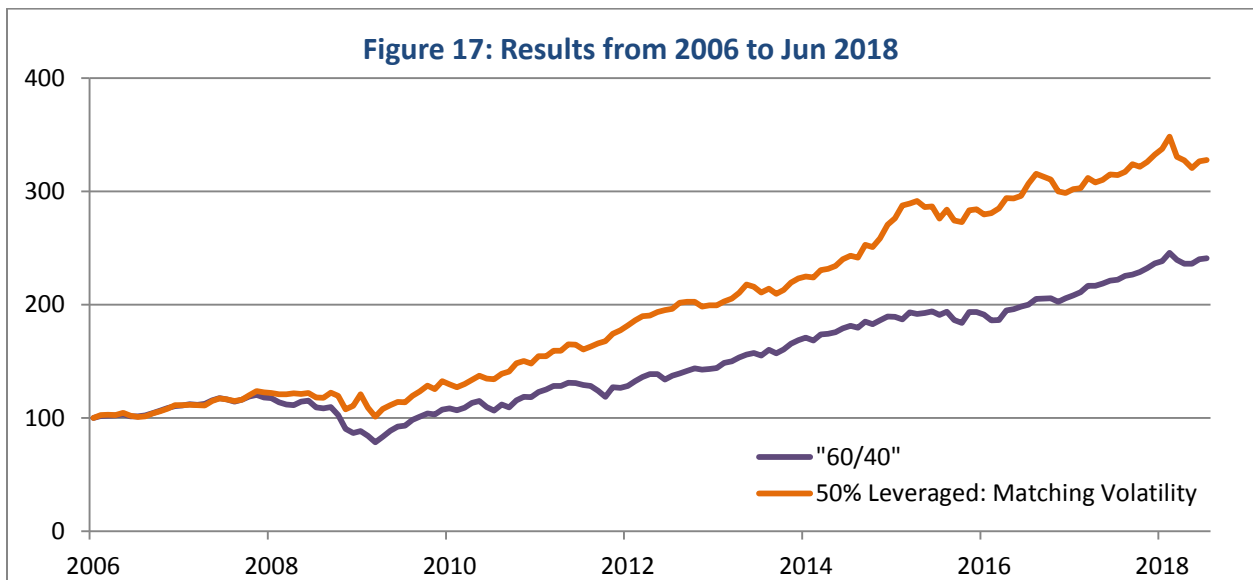| Table 4	"60/40"	UNLEVERAGED		LEVERAGED	
Jan 2006 - Jun 2018		Matching Rtn	Matching Vol	Matching Rtn	Matching Vol
Annualized Return	7.29%	7.29%	**8.32%**	7.29%	**10.37%**
Annualized Volatility	8.98%	6.31%	**8.98%**	5.90%	**8.98%**
Sharpe Ratio	0.66	0.95	0.78	1.01	1.01
Maximum Drawdown	34.8%	14.1%	32.6%	9.2%	13.7%
"SPY" Allocation	60%	44%	66%	37%	56%
"TLT" Allocation	0%	28%	34%	19%	29%
"LV" Allocation	0%	15%	0%	46%	70%
"MF" Allocation	0%	13%	0%	14%	22%
COREPLUS Bond Allocation	40%	0%	0%	0%	0%
Leverage	0%	0%	0%	17%	78%

Source: ABR white paper (data from Bloomberg)

What about investors who (1) are comfortable with the 9.0% annualized volatility of "60/40"; (2) want to increase their return above the 7.3% of "60/40"; and (3) are comfortable with some leverage but not the 78% leverage shown in Table 4? In the next installment, we will cover why leverage isn't a very good measure of risk, but this methodology still offers an answer for these investors as well. For example, an investor comfortable with no more than 50% leverage could select the portfolio represented by the orange square in the following graph (Figure 16).

Fg 16: "SPY"/"TLT"/"LV"/"MF" Historical Efficient Frontier 2006 - Jun 2018

A scatter/line plot titled "Fg 16" with y-axis "Historical Return" ranging from 5% to 13% and x-axis "Historical Volatility" ranging from 4% to 12%. It shows a dotted orange capital market line, a black efficient frontier curve, an orange diamond marker, an orange square marker, and a purple "X" marker labeled ("60/40").

The leverage was meaningfully reduced from 78% to 50%, without a huge sacrifice in the return (10.4% to 10.0%). The following graph and table (Figure 17 and Table 5) show the results and allocations.

Figure 17: Results from 2006 to Jun 2018

A line chart titled "Figure 17" with y-axis ranging from 0 to 400 and x-axis from 2006 to 2018. Two series are plotted: a purple line labeled "60/40" and an orange line labeled "50% Leveraged: Matching Volatility".

Legend:
- "60/40"
- 50% Leveraged: Matching Volatility

Table 5	"60/40"	50% LEVERAGE
Jan 2006 - Jun 2018		Matching Vol
Annualized Return	7.29%	9.96%
Annualized Volatility	8.98%	8.98%
Sharpe Ratio	0.66	0.96
Maximum Drawdown	34.8%	18.1%
"SPY" Allocation	60%	62%
"TLT" Allocation	0%	38%
"LV" Allocation	0%	31%
"MF" Allocation	0%	20%
COREPLUS Bond Allocation	40%	0%
Leverage	0%	50%

Source: ABR white paper (data from Bloomberg)

Finally, the following graph and table (Figure 18 and Table 6) show a direct comparison of the best possible portfolio using just "SPY" and "TLT" to the best possible portfolio using "SPY," "TLT," "LV," and "MF," with each portfolio matching the volatility of "60/40." **This comparison demonstrates the significant value added to a portfolio by the "LV" and "MF" alternatives, even though they were individually worse performers than "SPY" and "TLT" over this time period** (see the Appendix for individual performance graphs). Again, this value was added without any increase in risk, as measured by volatility.

Figure 18: Results from 2006 to Jun 2018
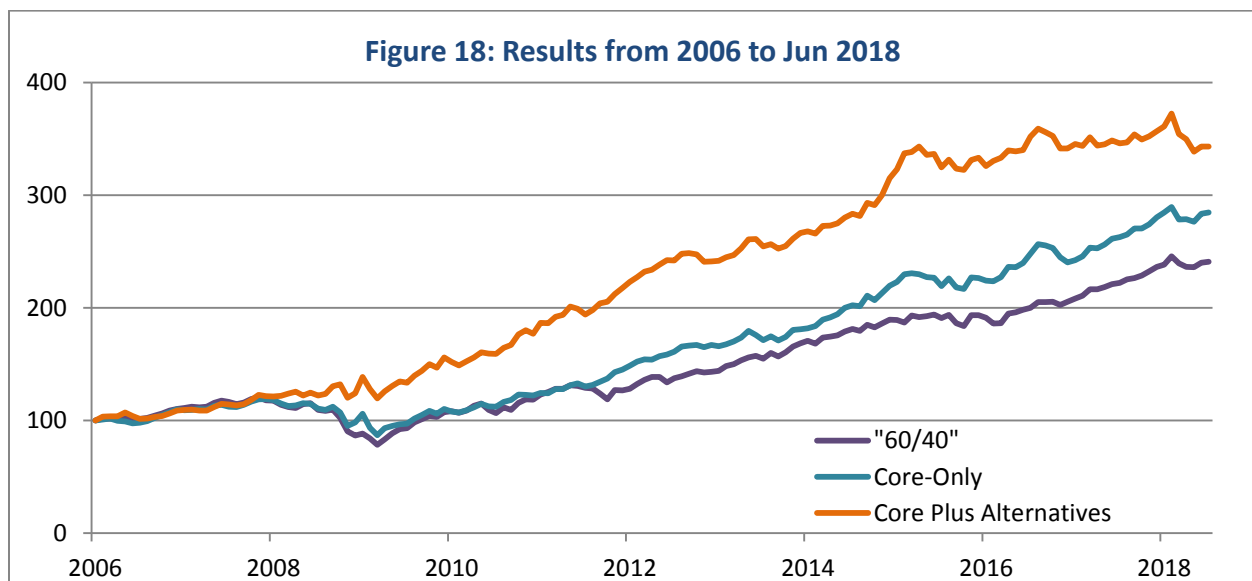
Source: ABR White paper (data from Bloomberg)

| Table 6 | "60/40" | LEVERAGED - MATCHING VOL | |
		Core-Only	Core Plus Alts
Jan 2006 - Jun 2018			
Annualized Return	7.29%	8.73%	10.37%
Annualized Volatility	8.98%	8.98%	8.98%
Sharpe Ratio	0.66	0.83	1.01
Maximum Drawdown	34.8%	27.0%	13.7%
"SPY" Allocation	60%	59%	56%
"TLT" Allocation	0%	52%	29%
"LV" Allocation	0%	0%	70%
"MF" Allocation	0%	0%	22%
COREPLUS Bond Allocation	40%	0%	0%
Leverage	0%	11%	78%

Source: ABR White paper (data from Bloomberg)

Observations

1. The term "core" was something of a misnomer. The alternatives ("LV" and "MF") were a large portion of the best portfolios.

2. The lesson of [installment 7](#) was "if you are properly diversified, you will always hate at least one of your positions." This idea is illustrated in two ways in this installment:

   a. The best portfolios in this installment used significant contributions from behaviors *with extended losing streaks, especially in bull markets* (visible in the Appendix).

   b. The best portfolios in this installment, which significantly outperformed "60/40" over the full market cycle, did *not* produce a higher return than "60/40" in the impressive equity rally since the 2009 lows. Even the leveraged portfolio which matched the volatility of "60/40" and far exceeded its return (dark orange in Figure 18 and Table 6) only made 11.4% annualized from April 2009 to June 2018, compared to 12.2% for "60/40" over that same time period.

      i. Long-term outperformance requires patience and does not mean outperformance in all market conditions.

3. Leverage was not a good measure of risk (more on this in the next installment). Portfolios incorporating leverage matched the volatility of "60/40" but with significantly increased returns.

Looking Ahead: Over the next several installments, we will address the following questions:

- *How can investors achieve the leverage necessary to remain on (or near) the orange line in Figure 13 above, and what might that leverage cost?*
- *What adjustments can be made for the fact that these results are based on historical data but investors cannot invest in the past?*
- *Once investors have selected the behaviors they want in their portfolios, how might they go about selecting specific investments to gain exposure to those behaviors?*

## Appendix – Component Behaviors

Equity Behavior
- Benchmark: S&P 500 Total Return Index
- Description: Equity behavior is the archetype of the market. It is a significant allocation for most investors and, as such, defines bull markets and crises.

Figure 19: Equity Behavior "SPY" from Jan 2006 to Jun 2018
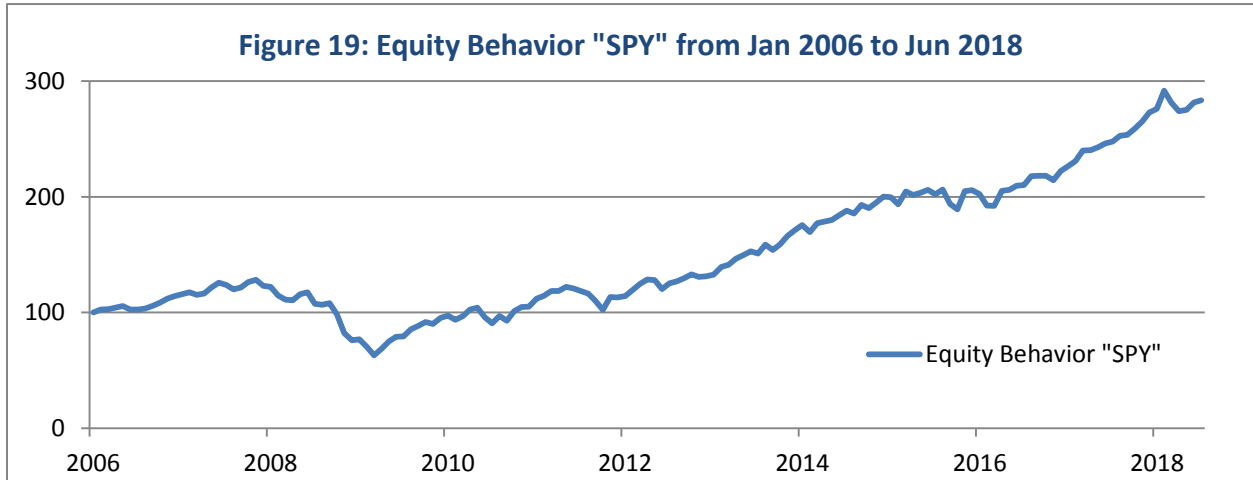
Interest Rate Behavior
- Benchmark: Bloomberg Barclays U.S. Treasury 20+ Year Total Return Index
- Description: Interest rate behavior is the most common tool used to complement equity behavior. U.S. treasuries are often considered a "flight-to-safety" asset. **To avoid confusion from the name "interest rate behavior," please note that these are, of course, the investible government bonds, not a measure of actual interest rates.**

Figure 20: Interest Rate Behavior "TLT" from Jan 2006 to Jun 2018
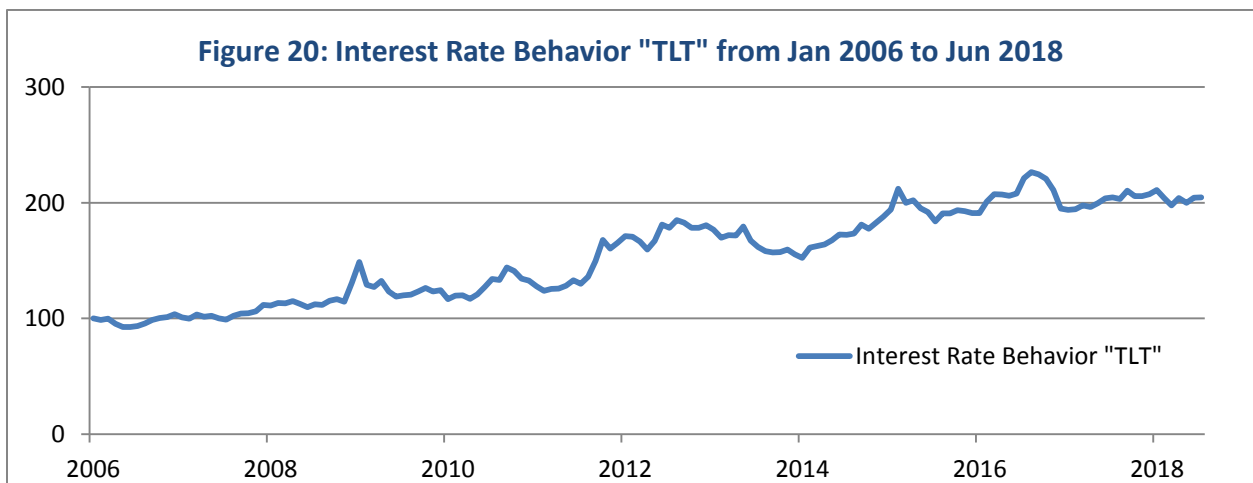
Managed Futures Behavior
- Benchmark: Credit Suisse Managed Futures Index
- Description: Managed futures behavior is generally trend following strategies, applied across numerous asset classes for the purpose of providing long-term growth that is not dependent on

(or similar to) equity behavior. It has, at times, captured both up and down trends, for the potential to win in various market conditions.
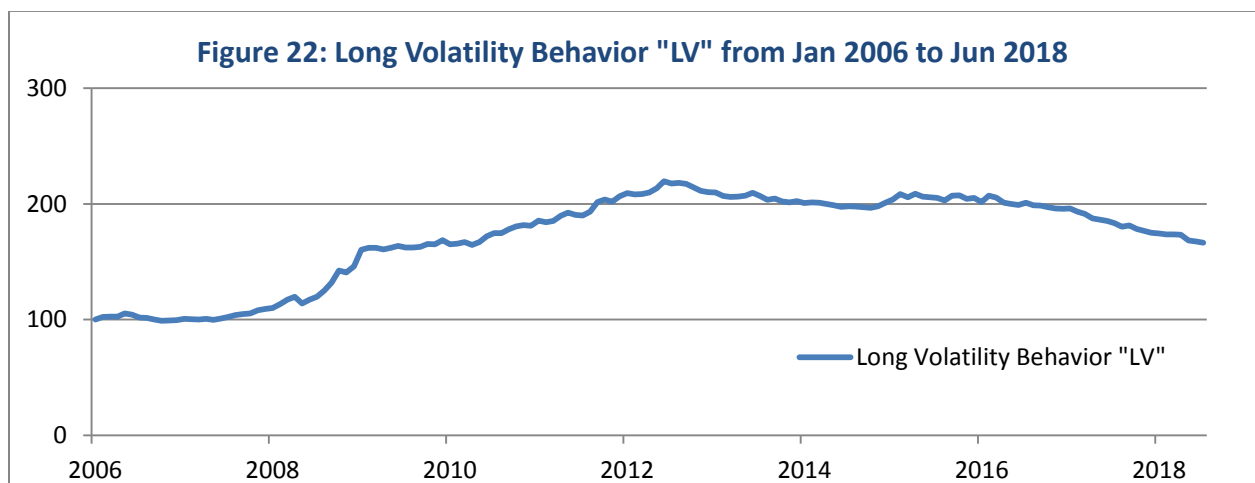
- It meets the criteria, from installment 8, of being affected differently than equities by changes in economic outlooks and interest rates, if for no other reason than it can take short positions.

Figure 21: Managed Futures Behavior "MF" from Jan 2006 to Jun 2018
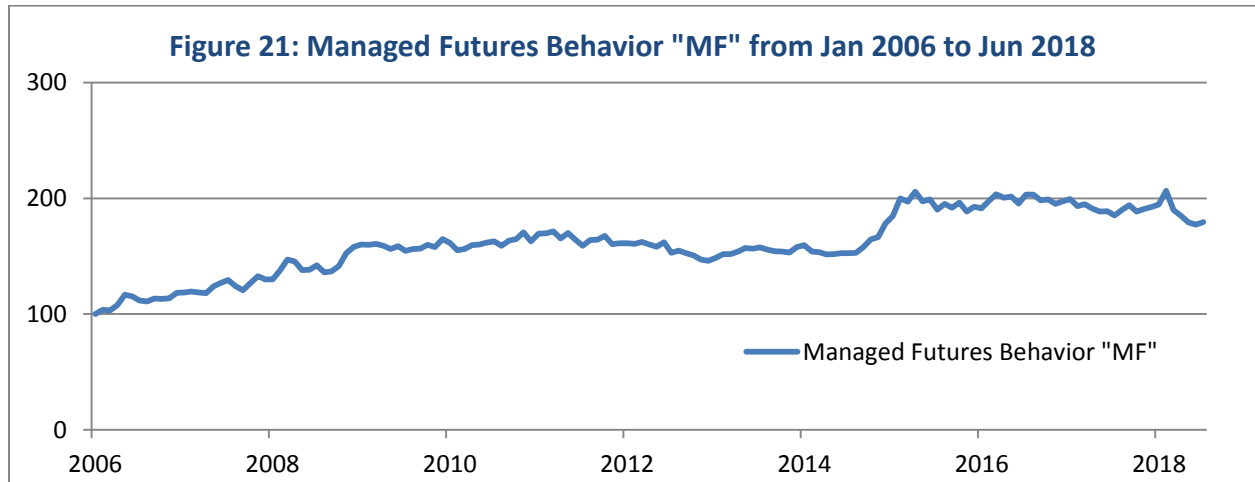
Source: ABR White paper (data from Bloomberg)

Long Volatility Behavior

- Benchmark: Eurekahedge CBOE Long Volatility Index
- Description: There are assets which provide direct exposure to the volatility of equity markets. These assets actually rise (fall) in value in response to increasing (decreasing) volatility in equity markets. They are often thought of as an "insurance policy" on equity behavior because a key feature of equity crises has been increasing volatility. However, also analogous to an insurance policy, they decay much of the rest of the time. There are strategies which seek to limit the decay. Collectively, we are calling them long volatility behavior. As such, long volatility behavior was the best performer in equity crises but created a drag much of the rest of the time.
- It meets the criteria, from installment 8, of being affected differently than equities by changes in economic outlooks and interest rates, because increases in volatility have often been associated with dropping equity markets.

Figure 22: Long Volatility Behavior "LV" from Jan 2006 to Jun 2018

Source: ABR White paper (data from Bloomberg)