An Intermarket Approach to Beta Rotation

The Strategy, Signal and Power of Utilities

Michael A. Gayed, CFA

2014 Charles H. Dow Award Winner

Updated Through October 31, 2020

Abstract: It is often said by proponents of the Efficient Market Hypothesis that no strategy can consistently outperform a simple buy and hold investment in broad stock averages over time. However, using a strategy based on the principles of intermarket analysis, we find that this assertion is not entirely accurate. The Utilities sector has many unique characteristics relative to other sectors of the broader stock market, including its higher yield, lower beta, and relative insensitivity to cyclical behavior. Our analysis suggests that rolling outperformance in the sector is not only exploitable, but also provides important signals about market volatility, seasonality, and extreme market movement. We explore historical price behavior and create a simple buy and rotate strategy that is continuously exposed to equities, positioning into either the broad market or the Utilities sector based on lead-lag dynamics. Absolute performance and risk adjusted returns for this beta rotation approach significantly outperform a buy and hold strategy of the market and of the Utilities sector throughout multiple market cycles.

Introduction

Buy and hold is often touted as the ultimate investment strategy when it comes to stock market investing. The reasoning for this relates to the belief in the Efficient Market Hypothesis, which states that because all known information is factored into price, there is largely no edge to active and dynamic trading. Indeed, numerous studies have documented the inability of investment managers benchmarked to a market average to consistently outperform passive strategies through stock selection.[1] However, academic studies have also noted persistent anomalies and phenomena in the marketplace which are consistent and exploitable, putting the Efficient Market Hypothesis in doubt.[2] Many of these studies focus on momentum and seasonality, and tend to be of intense interest for technical traders.

However, long before the power of momentum and seasonality was discovered through various white papers on those subjects, market technicians intuitively noticed price behavior which could lead broad market averages. Using intermarket analysis, a branch of technical analysis that has grown tremendously in recent years, technicians have uncovered relationships between asset classes which can be predictive of economic and market cycles. One of the more recognized relationships is between bonds and stocks, where bonds tend to lead preceding equity market tops and bottoms. It stands to reason then, that Utilities, the most bond-like sector of the stock market, would also show such leadership characteristics.

John Murphy, winner of the 2002 MTA Annual Award and a pioneer in the field of intermarket analysis, explored this concept in depth.[3] Murphy has stated that prior to a stock market top the "interest rate sensitive stocks, like the utilities and banks, usually start to break down. The most prominent and reliable are the utilities."[4] Martin Pring, winner of the 2004 MTA Annual Award and also an innovator in the field of intermarket analysis, wrote of the "tendency" for Utilities to "put on their best performance relative to the market on either side of the bear market low."[5]

Edson Gould was another technician who wrote of the power of Utilities many years earlier. Gould, who was referenced in 1977 as the "dean of technicians" by Forbes magazine and received the MTA Annual Award in 1975, focused specifically on the lead-lag relationship between Utilities and the market. In his 1974 writing, Gould referred to the Dow Jones Utilities Average as "one of the best early indicators of the stock market."

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[1] See Day, Wang, and Xu (2001).

[2] See Philip and Torbey (2002).

[3] The Market Technicians Association ("MTA"), founded in 1973, is a not-for-profit professional regulatory organization servicing over 4,500 market analysis professionals in over 85 countries around the globe. See www.mta.org.

[4] See Wilkinson (1997).

[5] See Pring (2002).

By noting how Utilities price action moved, Gould was able to make several accurate broad market forecasts. He postulated that "the Utilities reflect to a greater extent than the Industrials the investment demand for stock" and argued that "Utilities are money sensitive. Their steady growth requires huge and insistent capital investment so that their position and outlook is more dependent on interest and capital rate changes than are Industrial shares."[6]

The observations of Murphy, Pring, and Gould relating to the Utilities sector provided a roadmap for us to quantitatively test if Utilities lead broad stock averages over multiple market cycles. In this paper, we illustrate the results of that test, documenting the persistent and exploitable industry momentum in the Utilities sector relative to the broad market. We find that a strategy which positions either into the Utilities sector or the broad stock market based on leadership significantly outperforms a buy and hold strategy of both. In addition, we note that strength in the Utilities sector increases the probability of experiencing near-term fat tail events and higher overall stock market volatility. We also explore seasonality and find that the "sell in May and go away" strategy may be largely explained through beta rotation during summer and fall months. Finally, we illustrate how to execute the strategy today using Exchange Traded Funds ("ETFs") as the vehicle of choice.

Our findings are consistent with other studies which reference sector momentum and the gradual diffusion of information across and within markets, a major component of intermarket analysis. However, to our knowledge, no study has yet to quantifiably show how to outperform the stock market through Utilities rotation over time, nor has one explored the signaling power of low beta leadership as a leading indicator of heightened volatility.

Literature

The idea that one can generate excess returns through defensive beta rotation is not new. The concept is appealing in that it is intuitive to position into lower beta, non-cyclical sectors during corrections, recessions, and bear markets, and rotate into higher beta and more cyclically-sensitive sectors in favorable economic and market environments.

However, some studies have called into question this approach's feasibility. Davis and Philips (2007) argued that "implementing a defensive investment strategy based on the leading signals of bear markets and recessions (e.g., forward price/earnings ratios, momentum indicators, and the shape of the U.S. Treasury yield curve) would not have resulted in better results than following a buy-and-hold strategy." However, the strategy assumptions made in this study are entirely different than our suggested approach. Davis and Philips used macro cyclical indicators (such as the yield curve), valuation (such as

[6] See Gould (1974).

forward P/E), and an arbitrary definition of momentum (a 5% or 10% drop in the market over the trailing 12-months) as their risk triggers. These assumptions are quite different than our approach, which purely focuses on the relative price momentum of the Utilities sector and over a much shorter time frame.

Momentum is a well-documented characteristic of markets, through both individual stock movement over longer time periods and in the persistence of sector strength in shorter time periods. Moskowitz and Grinblatt (1999) note that "unlike individual stock momentum, industry momentum is strongest in the short-term (at the one-month horizon), and then, like individual stock momentum, tends to dissipate after 12 months, eventually reversing at long horizons." The specific time-frame of momentum drift at the one month horizon may be due to large-cap stocks leading small-cap stocks within a sector, and because "weekly portfolio returns are strongly positively autocorrelated" as documented by Lo and MacKinlay (1990). As information by market leaders gradually diffuses down to smaller competitors, investors act with a lag in trading such companies, causing the aggregate to continue in its prior direction.

Combining one-month momentum with defensive signaling through relative outperformance also has important implications on seasonal findings. A well-known strategy is "sell in May and go away," also known as the "Halloween Effect." This strategy focuses on the stock market's relatively poor performance during May through October as compared to the November through April period. Jacobsen and Visaltanachoti (2006) find a "substantial difference between summer and winter returns in different sectors and industries over the period from 1926-2006. The effect is almost absent in sectors and industries related to consumer consumption, but is strong in production sectors and industries." The Utilities sector in their work exhibits the highest probability of all sectors in terms of summer and winter returns being indifferent. Their findings confirm that throughout multiple cycles, Utilities exhibit very different behavior than many other sectors of the stock market, and are unaffected by the calendar. This allows for more consistent, exploitable lead-lag characteristics in Utilities.

Persistent strength in sectors, however, is about far more than simple trend following of leaders and laggards. The information contained in sector movement can be important from the standpoint of asset allocation and risk positioning. To the extent that sector movement can be indicative of future inflation, credit risk, and monetary policy, overall market averages might act with a lag to coming macro changes. Hong, Torous, and Valkanov (2005) argue that "an industry will lead the market if it has information about market fundamentals." They also find that "stock markets react with a delay to information contained in industry returns about their fundamentals and that information diffuses only gradually across markets."

Utilities are unique in this sense due to their behavior as a risk-averse, low beta sector, and their connection to interest rates as a driver of demand and earnings due to historically high debt/equity ratios. During periods of economic fragility and volatility in

financial markets, the Utilities sector tends to outperform broader cyclical trades. The less cyclical nature of the sector is largely due to prior regulation which limited pricing power, much of which began with the Public Utility Holding Company Act of 1935.[7] This Act regulated the parent or "holding" companies of Utilities by limiting rate increases and preventing speculation in riskier businesses with ratepayers' money. In preventing this speculation, Utilities became more insulated from idiosyncratic increases in their cost of borrowing money.

Thus, after the Act's passage, the earnings of the Utilities sector became more and more driven by the cost of capital rather than revenue growth prospects. When expectations for falling interest rates increased, Utilities tended to outperform the market due to a less robust growth period for the overall economy anticipated by investors in the sector. Conversely, when expectations for rising interest rates increased, Utilities tended to underperform. Therefore, the direction of interest rates became a major driver of earnings growth and beta sentiment, which caused investors focused on the sector to heavily consider the expected term structure of interest rates. The yield curve in and of itself is considered a leading indicator of the economy. By extension, Utilities might be considered a leading indicator of the stock market, inflation, interest rates, and volatility.

The Strategy

Edson Gould largely focused on the Dow Utilities relative to the Dow Industrials because that was the most readily available dataset from which to make his forecasts. However, because Dow indices are price-weighted, it stands to reason that a more comprehensive data set should be used to not only include more stocks, but also to more appropriately weight companies based on capitalization.

In addition, the Dow Utilities and Dow Industrials averages are not total return indices. Dividend yield information on Dow averages is limited, but clearly has a significant impact on investor wealth. Clarke and Statman (2000) estimated that if a total return calculation were done using dividend approximations, the Dow Jones Industrial Average in 1998 would have been 652,230 versus 9,181 for capital appreciation alone. Since dividends have such a large impact over time through compounding, and because the Utilities sector tends to have a higher dividend yield than the market average itself, a true strategy must incorporate total return data.

The data provided by Fama-French resolves both of these issues by being market weighted and total return.[8] Using the Fama-French price data going back to July 1926, we developed a simple trading strategy:

[7] Source: http://www.citizen.org/cmep/energy_enviro_nuclear/electricity/deregulation/puhca/

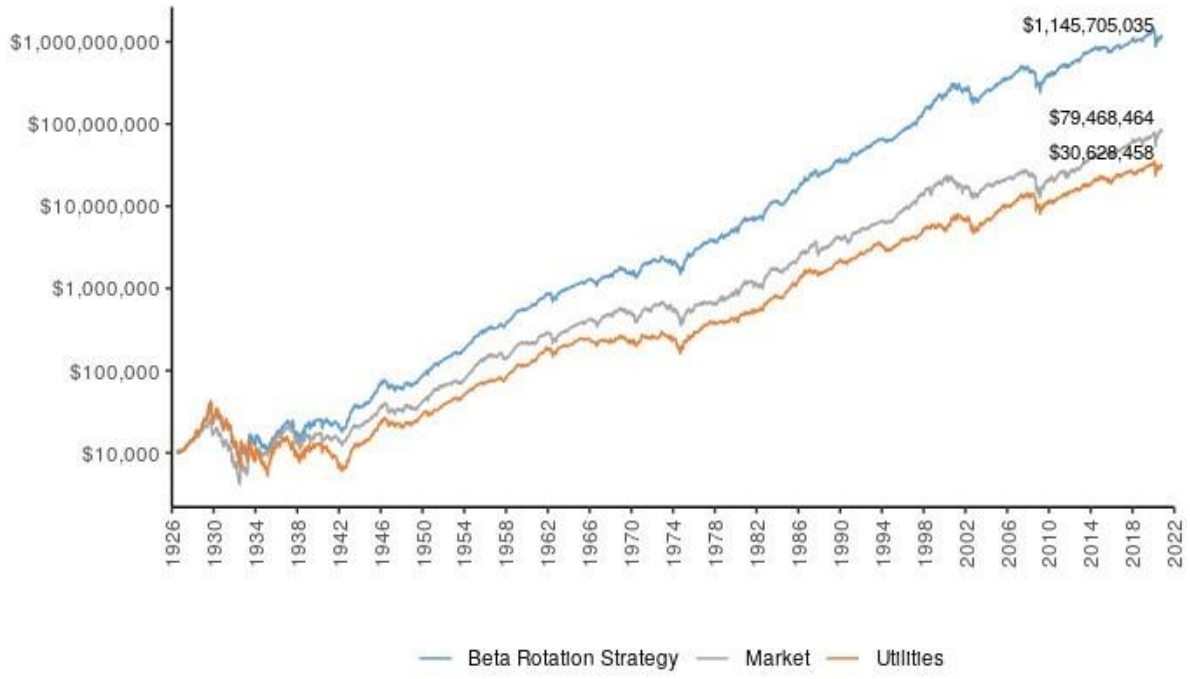
[8] Source: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

When a price ratio (or the relative strength) of the Utilities sector to the broad market is positive over the prior 4-week period, position into Utilities for the following week. When a price ratio (or the relative strength) of the Utilities sector to the broad market is negative over the prior 4-week period, position into the broad market for the following week.

The basis for using the 4-week rate-of-change interval is the research illustrating monthly momentum among industry groups.[9] In order to achieve a more tactical strategy that is better able to adapt to intra-month volatility, we converted the monthly time frame into a weekly signal. We have named the approach the Beta Rotation Strategy ("BRS") as it attempts to rotate into Utilities when the investing environment is more favorable towards lower-beta equities and into the market when the investing environment is more favorable towards higher-beta equities. Such a rotation translates the classic intermarket relationship of Utilities relative strength as a leading indicator of market cycles into an actual trading strategy.

Using the weekly signal from July 1926 through October 2020, the BRS shows significant outperformance versus a buy-and-hold portfolio of both the market and the Utilities sector. As illustrated in Chart 1 below, a $10,000 initial investment in the strategy in July 1926 grows to $1,146 million in September 2020 versus $79 million for the market and $31 million for the Utilities sector.[10]

Chart 1: Growth of $10,000: July 1926 - October 2020



[9] See Moskowitz and Grinblatt (1999).

[10] The assumptions used in this section are no slippage or commission (more on this later).

This translates into a substantial 3.1% outperformance per year with a 13.1% annualized return for the BRS compared to a 10% return for the market and a 8.8% return for the Utilities sector. But long-term outperformance by itself is not the only measure of the effectiveness of a strategy. If the predictive power of the Utilities sector is as strong as our research suggests, the outperformance of the BRS should be persistent over various time periods and also perform well on a risk-adjusted basis. Thus, we test the robustness of the BRS in a number of ways.

First, in Table 1, we break down the performance into various time periods around significant legislative events for Utilities. This is important as one could argue that the behavior of Utilities has changed over time, making the signal more or less powerful. What we find is the outperformance of the BRS is observable in all time periods. While the performance of the BRS did improve following the Public Utility Holding Company Act of 1935, the remaining time periods showed consistent outperformance.[11]

Table 1: Annualized Returns by Major Legislative Events

Time Period	BRS	Market	Utilities	Outperformance vs. Market	# Weeks
July 1926 - 1935	5.4%	4.3%	2.1%	1.1%	495
1935 - 1962	15.7%	11.2%	10.6%	4.5%	1409
1963 - 1978	10.6%	6.7%	4.7%	4.0%	835
1979 - 1992	19.8%	15.8%	15.7%	4.0%	730
1993 - Oct 2020	11.5%	9.8%	8.7%	1.7%	1452
1936 - Oct 2020	14.0%	10.6%	9.6%	3.4%	4426
All Years	**13.1%**	**10.0%**	**8.8%**	**3.2%**	**4921**

Second, in Table 2, we break down the performance of the BRS by decade. Here too we observe outperformance in all decades, with some normal variability. Importantly, we see the greatest outperformance during periods of market turmoil (1926-1929, 1970-1979, and 2000-2009). We discuss this finding in further detail in the volatility signal section below.

[11] Legislative events: 1) Public Utilities Holding Company Act of 1935, 2) "By 1962, 2419 electric and gas distribution Utilities came under jurisdiction of the SEC" (CRS Report for Congress on Electricity Restructuring Background, Amy Abel 1999), 3) Public Utility Regulatory Policies Act of 1978, 4) Energy Policy Act of 1992.

Table 2: Annualized Returns by Decade					
Time Period	**BRS**	**Market**	**Utilities**	**Outperformance vs. Market**	**# Weeks**
July 1926 - 1929	29.2%	17.0%	31.3%	12.2%	184
1930 - 1939	0.3%	-0.1%	-6.6%	0.4%	521
1940 - 1949	12.8%	9.3%	8.3%	3.5%	521
1950 - 1959	20.8%	18.3%	14.9%	2.5%	522
1960 - 1969	10.4%	8.4%	6.7%	2.1%	522
1970 - 1979	12.4%	5.7%	6.5%	6.8%	522
1980 - 1989	21.9%	16.9%	17.8%	5.0%	522
1990 - 1999	20.2%	18.0%	8.9%	2.2%	521
2000 - 2009	5.8%	-0.4%	8.4%	6.2%	522
2010 - 2019	12.6%	13.5%	10.8%	-0.9%	522
2020 - Oct 2020	-17.4%	6.3%	-7.4%	-23.7%	43
All Years	**13.1%**	**10.0%**	**8.8%**	**3.2%**	**4921**

Third, we evaluate the rolling 3-year outperformance of the BRS to test its consistency over a shorter time frame that is more in line with how many institutional investors judge investment performance. Chart 2 illustrates consistent outperformance during the overwhelming majority of 3-year time periods. Overall, the BRS outperforms the market in 78% of rolling 3-year periods.

Fourth, we tested the strength of the strategy on a risk-adjusted basis by taking the annualized returns of the BRS and dividing those returns by the annualized volatility of the BRS. We then compared this ratio to the same ratio for the market. What we found in Table 3 is that the strategy indeed shows superior risk-adjusted returns over multiple time periods.

Table 3: Annualized Return divided by Annualized Volatility			
Time Period	**BRS**	**Market**	**BRS-Market**
July 1926 - 1929	1.27	0.96	0.31
1930 - 1939	0.01	0	0.01
1940 - 1949	0.85	0.65	0.2
1950 - 1959	2.48	1.81	0.67
1960 - 1969	1.06	0.76	0.31
1970 - 1979	0.87	0.35	0.51
1980 - 1989	1.64	1.08	0.56
1990 - 1999	1.73	1.36	0.37
2000 - 2009	0.29	-0.02	0.32
2010 - 2019	0.99	0.94	0.05
2020 - Oct 2020	-0.45	0.18	-0.64
All Years	**0.73**	**0.56**	**0.17**

Lastly, we tested a long/short version of the BRS. When the BRS calls for a rotation into Utilities, the long/short strategy goes long the Utilities sector and short the market. Conversely, when the BRS calls for a rotation into the market, the strategy goes long the market and short the Utilities sector. Table 4 shows that the long/short strategy produced consistently positive annualized returns over time.

Table 4: Long/Short Strategy Annualized Returns		
Time Period	**BRS Long/Short**	**# Weeks**
July 1926 - 1935	2.0%	495
1935 - 1962	8.4%	1409
1963 - 1978	9.0%	835
1979 - 1992	6.4%	730
1993 - Oct 2020	2.8%	1452
1936 - Oct 2020	6.3%	4426
All Years	**5.9%**	**4921**

The Volatility Signal

It would have been highly challenging and unfeasible for an investor to carry out the BRS in the past. Before the advent of ETFs, gaining exposure to the entire Utilities sector or the broad market would have been extremely cumbersome to say the least. Additionally, a strategy based on weekly positioning would have been prohibitively expensive due to slippage and commission costs, particularly in the pre-May Day 1975 era.[12] However, just because it may not have been possible to follow through on such a strategy in the past

[12] For informational purposes, the outperformance of the BRS disappears when commission and slippage are higher than 0.37% per trade. "May Day" refers to May 1, 1975, when the S.E.C. mandated the deregulation of the brokerage industry.

does not mean one should disregard the relative strength of Utilities and its predictive power.

The lead-lag behavior of the Utilities sector can be a critical warning sign of higher average volatility to come in the market, and can be an early tell of whether the odds of an extreme tail event are rising.

In proving this thesis, we first examine the volatility of the market when the BRS is in Utilities (Utilities are leading) and compare that to the volatility of the market when the BRS is in the market (Utilities are lagging). If Utilities relative strength is predictive of higher volatility, then we should see higher volatility for the market when Utilities are leading and lower volatility for the market when Utilities are lagging.

This is indeed what we witness in Table 5, with overall market volatility of 18.7% when the BRS is in Utilities vs. market volatility of 16.9% when the BRS is in the market. The spread becomes more significant after the passage of the Public Utilities Holding Company Act of 1935 and the changing dynamics of the Utilities sector from then to 1962. Prior to this Act's passage, Utilities exhibited higher volatility than the market, whereas from 1963 until today, the sector has exhibited consistently lower volatility. When viewed over this time period, the spread widens to 4.4%, with a market volatility of 18.1% when Utilities are leading versus 13.7% when Utilities are lagging.

Table 5: Annualized Volatility

Time Period	Vol of Market when BRS is in Utilities	Vol of Market when BRS is in Market	Differential
July 1926 - 1935	28.3%	33.3%	-5.0%
1935 - 1962	15.1%	15.3%	-0.2%
1963 - 1978	16.4%	11.2%	5.2%
1979 - 1992	16.0%	13.6%	2.4%
1993 - Oct 2020	19.9%	14.9%	5.0%
1963 - Oct 2020	18.1%	13.7%	4.4%
1936 - Oct 2020	17.2%	14.2%	3.0%
All Years	**18.7%**	**16.9%**	**1.8%**

To test whether Utilities leadership was predictive of higher volatility over shorter time periods, we then measured the percentage of time the BRS was in Utilities during periods of market stress.

First, in Table 6, we looked at the worst weekly declines for the market since 1926. We found that during those weeks, the BRS was in Utilities for a significantly higher percentage of time than overall, suggesting that Utilities strength is a leading indicator of market volatility. In the worst 2% of weeks (declines > 5.5%) in history, the BRS was in Utilities 56.6% of the time versus 49.4% overall.

Table 6: Utilities Strength vs. Worst Market Declines (Jul 1926 - Oct 2020)				
Criteria	# Weeks	% of Time in BRS in Utilities	% of Time Overall in Utilities	Differential
Bottom 10% of Weeks (Decline > -2.4%)	493	57.40%	49.50%	8.00%
Bottom 5% of Weeks (Decline > -3.7%)	247	57.90%	49.50%	8.40%
Bottom 2% of Weeks (Decline > -5.5%)	99	57.60%	49.50%	8.10%

Next, in Table 7, we looked at both the highest levels of VIX values and greatest spikes in history. While the data set for the VIX only dates back to 1990, we find similar results to Table 6. The BRS strategy was positioned in Utilities at a much higher rate during periods of market stress than overall.

Table 7: Utilities Strength vs. High VIX/VIX Spikes (Jan 1990 - Oct 2020)				
Criteria	# Days	% of Time in BRS in Utilities	% of Time Overall in Utilities	Differential
Top 1% of VIX Value (Above 49.2)	78	74.40%	47.90%	26.40%
Top 5% of VIX Value (Above 33.8)	389	57.30%	47.90%	9.40%
Top 10% of VIX Value (Above 28.9)	776	58.50%	47.90%	10.60%
Top 1% of VIX Daily % Change (>22.8%)	78	61.50%	47.90%	13.60%
Top 5% of VIX Daily % Change (>11.3%)	389	55.30%	47.90%	7.30%
Top 10% of VIX Daily % Change (>7.6%)	777	52.90%	47.90%	5.00%

The Seasonality Signal: Sell in May and Rotate Away?

"Sell in May and go away" is a finding that instructs investors to sell their stock holdings in May before the worst 6-month period for stocks and re-enter those positions in November before the best 6-month period for stocks. A number of studies have shown the persistence of this strategy over time in various global markets. Reasons postulated for this phenomenon include, among others, vacations during summer months and changes in risk aversion due to Seasonal Affective Disorder (SAD).[13]

Our analysis, illustrated in Table 8, confirms that performance is significantly higher during the November through April period than the May through October period. This is true for the Utilities sector, the market, and the BRS. We also observed that the percentage of time the BRS is in Utilities is significantly higher in the summer months (50.7%) than in the winter months (48.2%).

[13] See Kamstra, Kramer and Levi (2003).

Table 8: Sell in May and Rotate Away?				
Month	Utilities	Market	BRS	% of Time Overall in Utilities
Jan	1.7%	1.3%	2.1%	56.7%
Feb	0.2%	1.1%	1.2%	52.2%
Mar	0.3%	0.5%	0.7%	41.3%
Apr	0.9%	1.4%	1.5%	46.4%
May	0.8%	0.6%	0.6%	44.7%
Jun	1.4%	1.0%	1.3%	52.1%
Jul	1.5%	1.4%	1.7%	53.3%
Aug	0.8%	1.1%	1.2%	52.4%
Sep	-0.3%	-0.7%	0.0%	44.9%
Oct	0.7%	0.4%	0.6%	56.4%
Nov	0.4%	1.4%	1.5%	50.0%
Dec	1.9%	1.7%	1.8%	42.9%
Nov-Apr	5.6%	7.6%	9.0%	48.2%
May-Oct	4.9%	3.9%	5.5%	50.7%
Overall	10.8%	11.7%	14.9%	49.5%

This is important as it may provide an additional clue as to why “sell in May” has persisted over the years. If, as argued by Jacobson and Visaltanachoti (2006), Utilities show the least differentiation among sectors between summer and winter months, then it stands to reason that deviations in their relative strength would have more predictive power than other sectors. Given that Utilities are the most bond-like sector of the market, changes in interest rates are likely a driving force behind these deviations.

We indeed see this as interest rates have tended to fall during the May through October period and rise during the November through April period (see Table 9). This confirms the linkage between seasonal strength in bonds (falling yields) and more time spent in Utilities during the worst six months, which is consistent with the aforementioned impact of rates on sector movement.

Table 9: 10-Year Yield Monthly Seasonality (1962 – 2020)		
Month	Basis Points Change (Avg)	% With Rising Yields
Jan	1.2	53.0%
Feb	3.4	54.0%
Mar	3.7	58.0%
Apr	6.4	58.0%
May	-1.4	56.0%
Jun	-1.8	47.0%
Jul	1.6	47.0%
Aug	-5.2	47.0%
Sep	-3.9	49.0%
Oct	-3	49.0%
Nov	-5.8	47.0%
Dec	-0.6	47.0%
Grand Total	-0.5	51.0%
Nov-Apr	8.3	53.0%
May-Oct	-13.8	49.0%

Finally, we need to address how the BRS compares to a simpler rotation into Utilities in May and into the market in November. As Table 10 illustrates, the BRS shows 2.8% outperformance vs. this strategy overall and outperformance during both summer (0.8%) and winter (1.9%). These results indicate that the power of Utilities to detect periods of market stress in all time periods, including the seasonally strong winter months, outweighs a strategy of simply avoiding stress during the summer months.

Table 10: BRS vs. Rotate in May			
Time Period	BRS	Rotate to Utilities in May	Differential
Jan	2.1%	1.3%	0.8%
Feb	1.2%	1.1%	0.1%
Mar	0.7%	0.5%	0.2%
Apr	1.5%	1.4%	0.2%
May	0.6%	0.6%	0.0%
Jun	1.3%	1.4%	-0.1%
Jul	1.7%	1.5%	0.1%
Aug	1.2%	0.8%	0.4%
Sep	0.0%	-0.3%	0.3%
Oct	0.6%	0.7%	0.0%
Nov	1.5%	0.9%	0.6%
Dec	1.8%	1.7%	0.0%
Nov-Apr	9.0%	7.1%	1.9%
May-Oct	5.5%	4.7%	0.8%
Overall	14.9%	12.1%	2.8%

Exchange-Traded Fund Strategy

With the advent of Exchange Traded Funds (ETFs) and lower trading costs in recent years, we can now test the viability of the BRS using actual trading instruments. The ETFs with

the longest price history that best approximate the Fama-French dataset are the Utilities Select Sector SPDR® Fund ("XLU") and the Vanguard Total Stock Market ETF ("VTI").

Using the same 4-week rate-of-change methodology outlined earlier and total return data from July 2001, the ETF Beta Rotation Strategy ("ETF Strategy") outperforms a buy and hold portfolio of both XLU and VTI. Table 11 shows that from July 2001 through October 2020 the ETF Strategy achieved total returns of 412% versus 295% for XLU and 338% for VTI. If we make an assumption of 0.1% per trade for commission and slippage, the ETF Strategy shows a slight underperformance vs. XLU and VTI, however at a lower volatility. On a risk-adjusted basis it is superior, with a higher ratio of annualized return to annualized volatility than XLU and same as VTI over time.

Table 11: Performance Metrics (July 2001 – Oct 2020)

Metric	XLU	VTI	ETF Strategy (Gross)	ETF Strategy (Net)
Cumulative Return	295%	338%	412%	307%
Annualized Return	7.4%	7.9%	8.8%	7.5%
Annualized Volatility	18.3%	18.2%	17.5%	17.5%
Annualized Return/Volatility	0.40	0.43	0.50	0.43

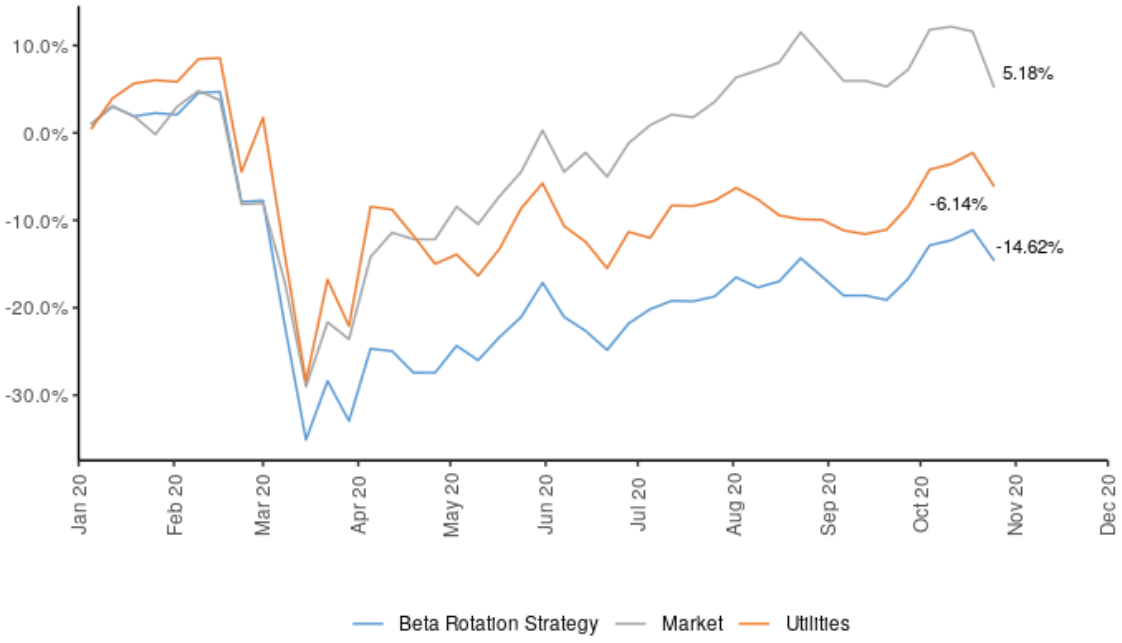
The outperformance is due in large part to the volatility signaling power of Utilities relative strength, which is consistent with the results of the BRS. The volatility of the market (VTI) when the ETF Strategy was in XLU was 20.8% versus a volatility of 15.4% when the ETF Strategy was in VTI. Another way to illustrate this is to look at the largest market declines and highest VIX levels during the time period. We found that, similar to the BRS, the ETF Strategy was in XLU 62.7% of the time during the worst 5% of declines for the market and 62.5% of the time during the top 5% of VIX values. This is significantly higher than the percentage of time the ETF strategy was in XLU overall, at 48.7%.

What Happened in 2020?

It does not go without notice that the BRS failed to deliver the desired performance in the first months of 2020. It underperformed the market by -19.8% (-23.7% annualized as shown in Table 2), being down 14.6% since the year started.

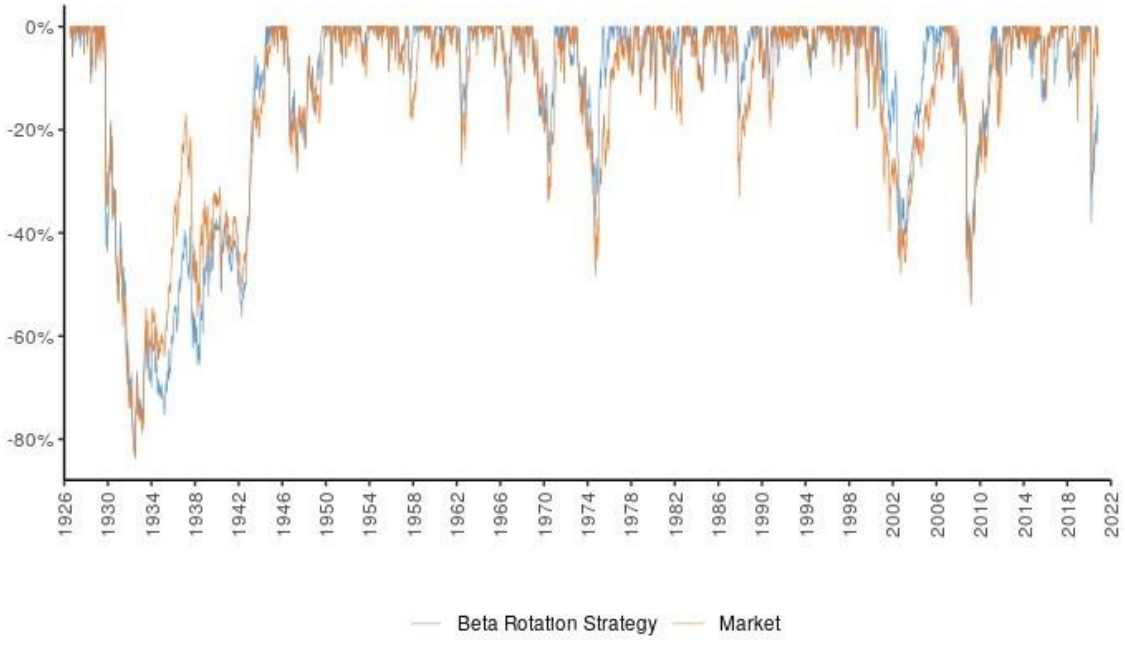
A closer look at the performance Chart 3 reveals that, as the broad market, the strategy took a hit in March 2020, being positioned on the disadvantageous side for several weeks. Subsequently it would be in utilities for too long, and thereby missing a large part of the market rebound.

Chart 3: Performance January 2020 - October 2020



When we put this into historical perspective we see that this was neither the largest drawdown, nor has it been the longest. Looking closely at the cumulative drawdowns in Chart 4 we observe that the BRS did a good job at recovering in the past. The overall up-market capture ratio is 89% and the down capture 79%, consistent with the idea that the strategy tends to lag on the upside, but be down less on the down.

Chart 4: Cumulative Drawdown: July 1926 - October 2020



As can be seen when comparing Table 12 and Table 13, the market took considerably longer to recover from the worst drawdowns as opposed to the BRS. We also observed considerably longer drawdown periods than the ongoing one. It is no novelty that some signals are weaker or stronger in certain market conditions.

Table 12: Worst Drawdowns for the BRS Since July 1926

From	Trough	To	Depth	Length (weeks)	To Trough (weeks)	Recovery (weeks)
1929-09-22	1932-07-03	1944-07-02	-83.6%	771	146	625
2007-05-20	2009-03-01	2011-02-13	-52.9%	196	94	102
2000-12-31	2002-09-29	2005-02-20	-43.3%	217	92	125
1972-11-26	1974-09-08	1975-06-01	-39.0%	132	94	38
2020-02-23	2020-03-15		-38.0%	37	4	

Table 13: Worst Drawdowns for the Market Since July 1926

From	Trough	To	Depth	Length (weeks)	To Trough (weeks)	Recovery (weeks)
1929-09-08	1932-07-03	1944-12-10	-83.7%	796	148	648
2007-10-14	2009-03-01	2012-03-11	-54.1%	231	73	158
1973-01-07	1974-09-29	1976-12-26	-48.2%	208	91	117
2000-03-26	2002-09-29	2006-10-22	-47.9%	344	132	212
1968-12-01	1970-05-17	1972-01-02	-33.9%	162	77	85

Conclusion

We find that the signaling power of the Utilities sector is a market anomaly that has persisted over time. The Utilities sector has less economic sensitivity and is more dependent upon the cost of capital than other sectors. Therefore, fluctuations in its relative price movement can have broad implications on macroeconomic factors. Yet, contrary to the Efficient Market Hypothesis, the information that lead-lag dynamics may have about the near-term future may not be fully priced in immediately by broad market averages. This lagged reaction is precisely what makes their strength and weakness exploitable.

The implications from both a strategy and signaling standpoint are meaningful. We find that by using a Beta Rotation Strategy based on the principles of intermarket analysis and momentum, one could have consistently outperformed a static buy and hold strategy over many market cycles.

Outperformance is achieved by timing exposure to beta using a rolling 4-week relative strength signal of the Utilities sector to the market. The strategy rotates into Utilities when the investing environment is more favorable towards lower-beta equities and into the market when the investing environment is more favorable towards higher-beta equities. Importantly, because the Beta Rotation Strategy spends roughly half of its time in Utilities, it is also able to benefit from the compounding effect of higher dividend yields. We

observe consistent outperformance in the vast majority of periods, and that the rotation signal may offer further insights into explaining seasonal patterns such as "sell in May and go away."

We also find that strength in the Utilities sector often serves as a warning sign of increased volatility and extreme market movement in the short-term, allowing active traders to better manage risk during potential periods of heightened market stress. By simply respecting intermarket relationships and price history, this important finding can add to one's trading arsenal in seeking higher risk-adjusted returns and in reducing the probability of experiencing fat tail events.

Further Research

Although beyond the scope of this paper, there are a number of broader implications that our findings may have on the investing and trading landscape, particularly as it relates to volatility. Among these are: (1) implementing option overlay strategies, (2) hedging, (3) timing of gross exposure or leverage, and (4) tactical asset allocation.

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