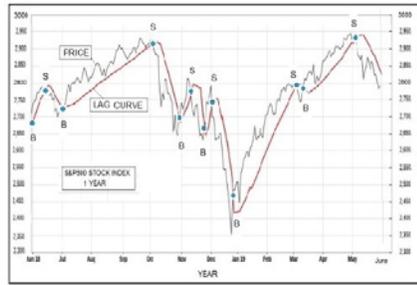


WHAT ARE TIME WINDOWS FOR STOCK PRICES AND THE CORRESPONDING LAG CURVES?

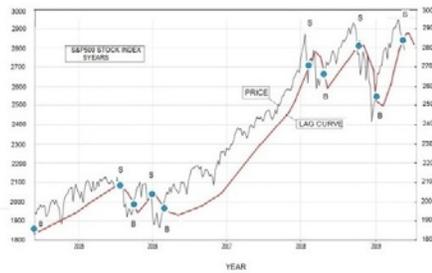
Studying stock, bond, commodity, and real estate prices have been a side hobby of mine for over sixty years. What I have learned throughout these years of observations and trading is that prices, which at first may appear random, actually follow trends of unknown duration depending on the time period one is looking at. Such trends are easiest to spot by examining the time history of price movements over chosen time intervals from the present to the past and comparing them with superimposed lag curves. The trends are dependent on the time windows being used. When the same trend is present in all windows being considered one can act on it and hold things long or short until the trend reverses. How long a trend will last is any one's guess. All I care about is to get out immediately when a trend reverses. Typically I choose three distinct time windows for stocks and bonds. These are a long term window extending back twenty five years, to an intermediate time window of five years, to a short time window of just one year. Trends are spotted by drawing lag curves for the time dependent prices in each of these windows. I generally do not concern myself with even shorter time windows of days such as used by commodity traders to microsecond windows as used by arbitrageurs. To avoid major instantaneous price reversals, I confine myself to stock averages as reflected through active exchange traded funds such as SPY, QQQ, EEM and IWM. It is our purpose here to explain in greater detail how one can be successful in stock and ETF investing using just three time windows and their corresponding lag curves. Our transactions are not based on fundamentals such as earnings trends, political events, or world wide economic factors. These in general will be already known to most investors and will already have been built into the price. Bull and Bear markets will be determined in our technical approach by the lag curve lying below or above the price curve, respectively.

We begin our discussion by graphing prices of the S&P500 Stock Index(\$INX) over three different time windows of twenty five, five, and one year and superimposing a lag curve for each of these windows. The raw data is obtained from the web at www.barchart.com. This is an excellent free service yielding extensive information on whether a stock or ETF should be held long or short. The chart we have constructed from data given there follows-

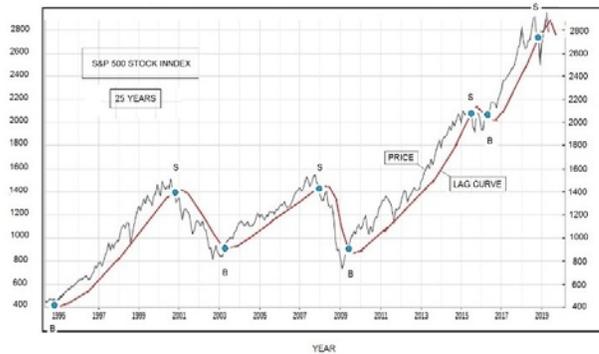
PRICE-LAG CURVES FOR THREE TIME WINDOWS



ONE YEAR
WINDOW



FIVE YEAR
WINDOW



25 YEAR
WINDOW

The lag curves (λ) are drawn in by eye and typically lie within 10% of the price. When a red lag curve lies below the price curve $P(t)$ one has a bull market characterized by an uptrend. When the reverse is true then one is in a bear market for that particular time window. The light blue circles indicate cross over points where the trend changes from up to down trend or visa versa. The fastest reaction to a change in trend typically occurs in the window with the shortest time span. If the new trend is for real then the blue points will also follow soon after for the remaining two windows. When all three windows are in agreement as to the trend one should act accordingly until the trend reverses.

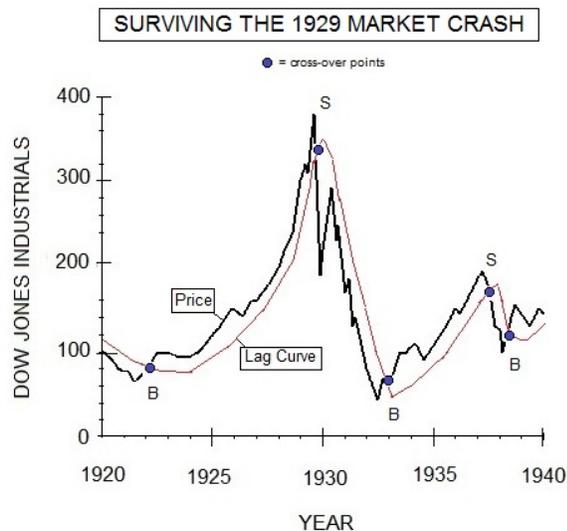
Several years ago, right after the presidential election of 2016, the price trend in all three windows was up with prices lying above the lag curve. This indicated a bull market and the need to be long. This is exactly what I did. I held long the ETF SPY from November 2016 until January of 2018 reaping a 15% return on my capital in a little over one year.

In looking at the longer term 25 year window, one clearly can see when one is in a bull market uptrend or a bear market downtrend . The conditions for either market follow-

Price > Lag Curve - Uptrend - Hold Long - Bull Market

Price < Lag Curve - Downtrend - Be Short - Bear Market

Trend changes occur when a blue circle appears. The B and S signals at these crossover points indicates whether one should be long or short until the next trend reversal. One should never be in a position of holding a stock or ETF long when $p < \lambda$ or being short when $p > \lambda$. You never want to average down since that is what can lead to major losses. Just think of the holders of Enron, Bear-Sterns, Sears, and General Electric who held on. Going back further in history, look at the following chart of the Dow Jones Industrial Average over the twenty year period from 1920 to 1940. It shows what happened to investors who remained long after the late summer of 1929-



The largest returns with the present three window-trend approach will be found by going long when B is first indicated and going short when S is indicated. Many investors like myself are somewhat reluctant to go short. In that case there will be a period of holding cash during a downtrend followed by a buy when the next uptrend occurs. The returns for this less risky approach will be lower but still reasonable in the longer run.

For those willing to leverage ones investments, ETFs such as SPY and QQQ have their leveraged counterparts for both the long and short market phases. Here is a tabulation of such investment opportunities as it existed about two years ago-

S&P500 AND NASDAQ BASED ETFS AND THEIR LEVERAGED EQUIVALENTS

ETF Name	Price(\$/sh)	Volume(10 ⁶ /day)	VxP	3 Month Gain
UPRO(3x)	157.64	1.86	293.21	+30.09%
SSO(2x)	118.40	1.5	177.6	+19..21%
SPY(1x)	277.92	90.8	25235.14	+9.14%
SH(-1x)	29.01	2.6	75.66	-8.26%
SDS(-2x)	37.91	3.9	147.85	-16.61%
SPXU(-3x)	10.08	8.7	87.70	-25.92%

ETF Name	Price(\$/sh)	Volume(10 ⁶ /day)	VxP	3 Month Gain
TQQQ(3x)	162.79	3.71	603.95	+30%
QLD(2x)	81.63	1.32	107.75	+23%
QQQ(1x)	164.49	37.7	6201.27	+11%
SQQQ(-3x)	18.25	5.4	98.55	-28%
QID(-2x)	12.0	3.9	46.8	-19.8
PSQ(-1x)	33.70	0.68	22.92	-10.25%

Leverages up to 3x are possible with a corresponding increase in return. There is however a problem with using such leverage when trying to maintain a liquid account. The daily volume for these leveraged positions is typically much smaller than the 1x possibilities using SPY(based on the S&P500 Index) and QQQ(based on the Nasdaq 100 Index) .

We have shown above that using only uptrends and downtrends in a stock or ETF determined by lag curves for three different time windows allows one to be long during up markets and short in down markets. The method has worked well for me in the past although there have been occasions where one is whipsawed with small losses when the time between a B and S signal is short.

U.H.Kurzweg
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Gainesville, Florida