

RisKontroller

Is the S&P 500 Crashing? Recession Coming?

RisKontroller Global LLC

Jerome L Kreuser 20-January-2019

info@RisKontroller.com

24-Jan-19



RisKontroller Global
"Shape the Future"™

Disclaimer

- HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS SUBSEQUENTLY ACHIEVED BY ANY PARTICULAR TRADING PROGRAM.
- NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR TO ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS.
- The presentation contains forward-looking information. We make numerous assumptions, risks, and uncertainties that change over time and these are not all included or implied in this presentation. Actual results could differ materially from those anticipated by any forward-looking information and future results could differ materially from historical performance.



We apply our bubble technology to the problem:

- It picks up crash/rally signals.
- It calibrates a normal price that the actual price oscillates about.
- We have applied it to many asset prices.

See details on our website <http://riskcontroller.com/info-center/>

- Our research has been published in
 - European Journal of Finance
 - Wilmott Journal
 - SSRN (In Top 10 downloads for 2018) and Swiss Finance Institute

Applications of the technology:

- We are supplying signals to a large mutual fund in India.
- Predicted and published Bitcoin crash in December 2017.
- Our own AugurMax asset allocation strategy.



Our model picks up signals

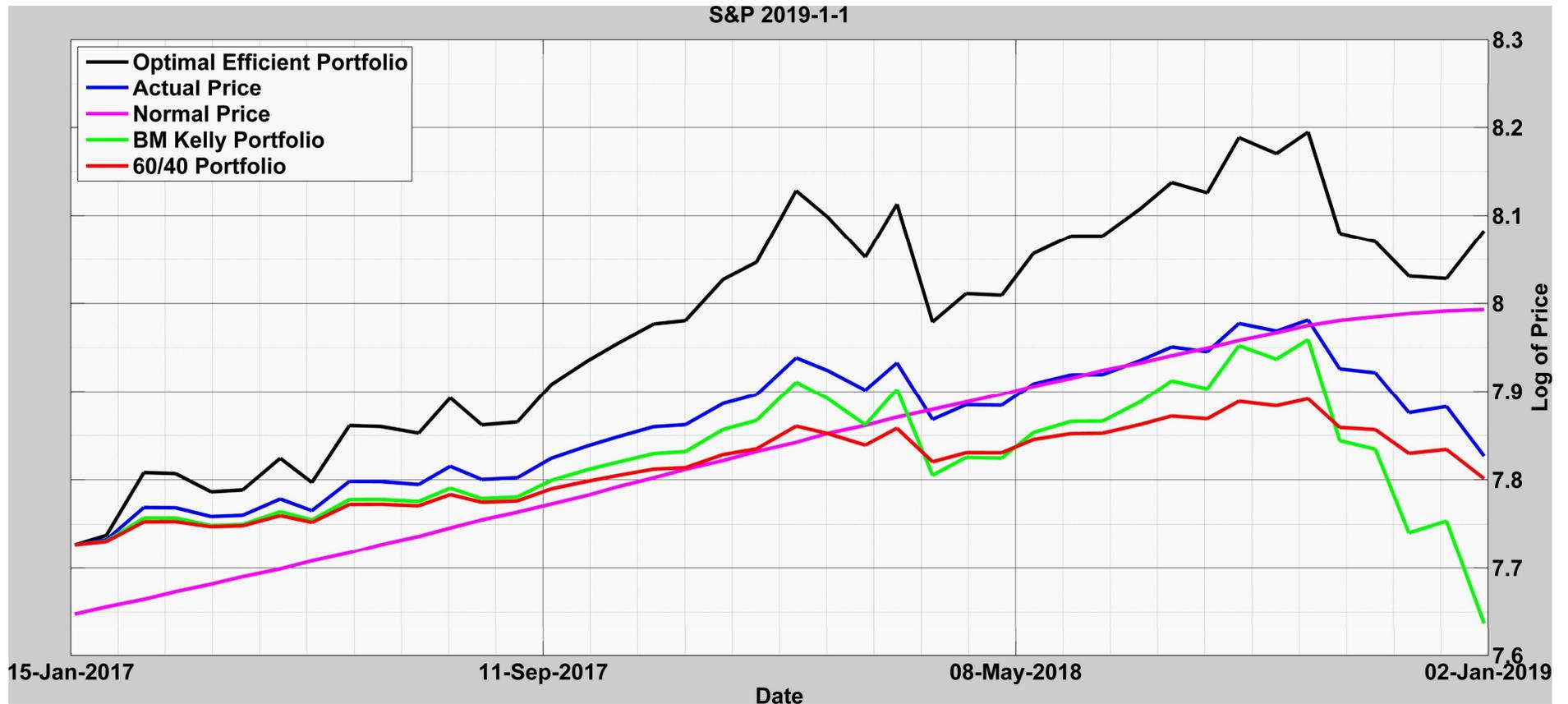
- Those signals are generating by accelerating sells or buys that exhibit rapid decline or growth in asset prices.



We calibrate our model on a parsimonious set of four parameters

- We calibrate our parameters by optimizing them over a small finite set and pick the parameter values that give the best outperformance of the efficient portfolio. The efficient portfolio is made of the asset plus a riskfree rate and either can be leveraged up to 100%. See papers for details.
- The following graph maps out the log of the asset price and normal price.
- The portfolios consist of:
 - The optimal efficient portfolio
 - A 60/40 portfolio: asset/risk-free
 - The classical Kelly method of picking the asset and risk-free rate.

Log of actual S&P price and normal price along with logs of portfolio values



Notes on the graph

- The optimal efficient portfolio provides a total return over the two years ending 1 Jan. 2019 of 42.8% versus 10.5% for the S&P500.
- The optimal efficient portfolio beats other portfolios.
- The S&P 500 tracks the normal price for a good part of 2018.
- The S&P 500 begins a decline in October 2018.

- What is missing from this graph is a signal correlated with the change in the optimal efficient portfolio.
- We also have to say whether or not we think the price is crashing.
- **We do these things next.**



What is a crash or rally?

We simply mean a price movement over a short period of time (usually days) where the movement is not explained by Brownian motion but rather by a jump. This jump does not need to be big in size.

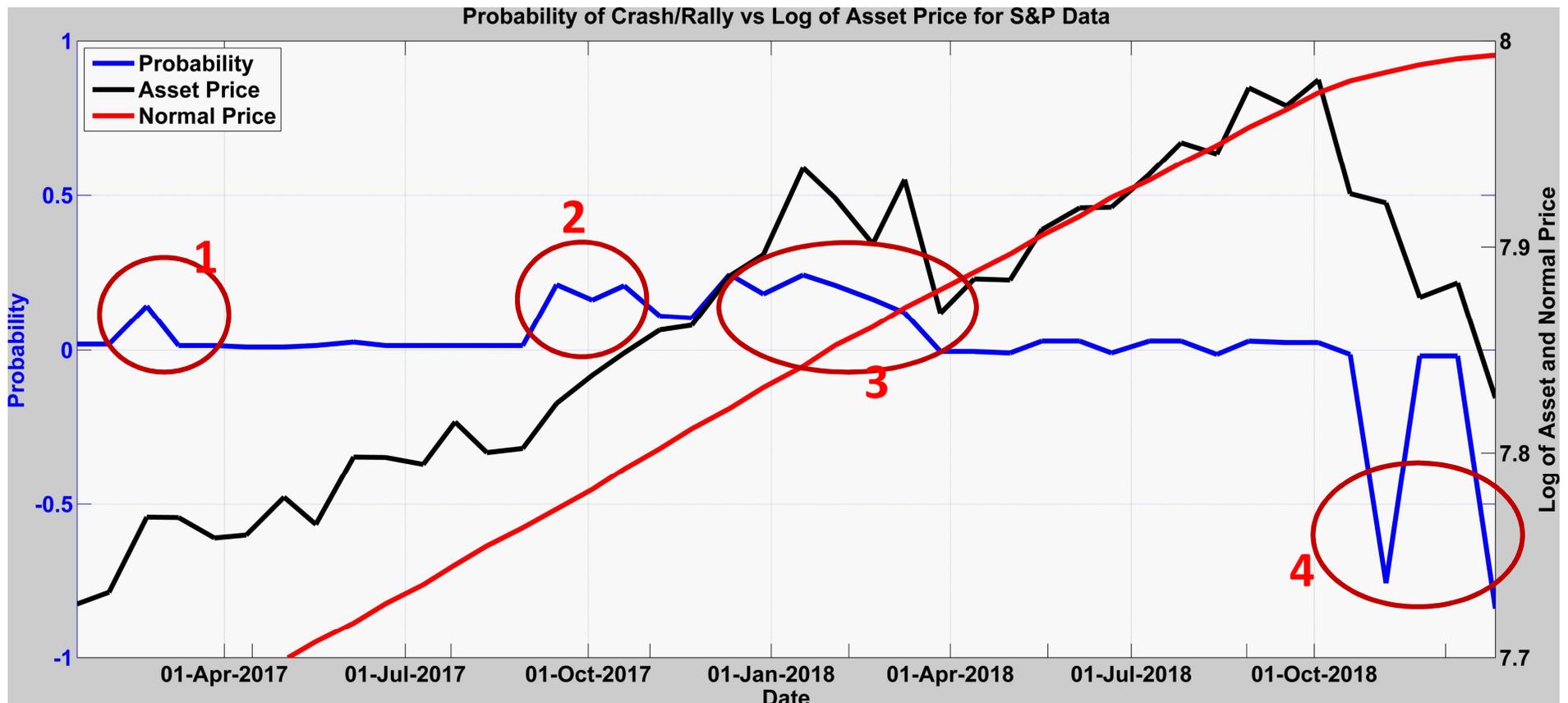
Our process provides information on the timing, size, and probabilities as it explains these movements.



There are two main signals; one is the probability of a crash/rally and the other is the size of the crash/rally.

- The next graph maps the probability of a crash/rally with the asset price and the normal price.
- At any point in time, a crash is associated with a positive probability and a rally is associated with a negative probability.
- The probabilities are computed by assuming our rational expectations condition as described in our paper and by implementing a method to estimate acceleration in the asset price (super-exponential).
- The numbered and circled items on the graph are explained next.
- Other indicators will not be discussed here.

The graph of the log of the asset price and normal price along with the probability of a crash or rally. Positive probability for a crash and negative for a rally.



The numbered items explained.

1. The probability of a crash jumps up a bit here prior to the downturn. But it is not a major correction.
2. The probability jumps up a bit here but there is no downturn.
3. In this case the probability of a crash moves up for some time until the downturn is finally realized.
4. The asset price then proceeds along the normal price for a little over 6 months until the downturn occurs. The probability of a rally jumps but falsely as it quickly reverts back to a near zero probability -- a short time later it jumps down again to an 84% probability of a rally on December 31, 2018. We shall see in a subsequent slide what happens.

The lesson

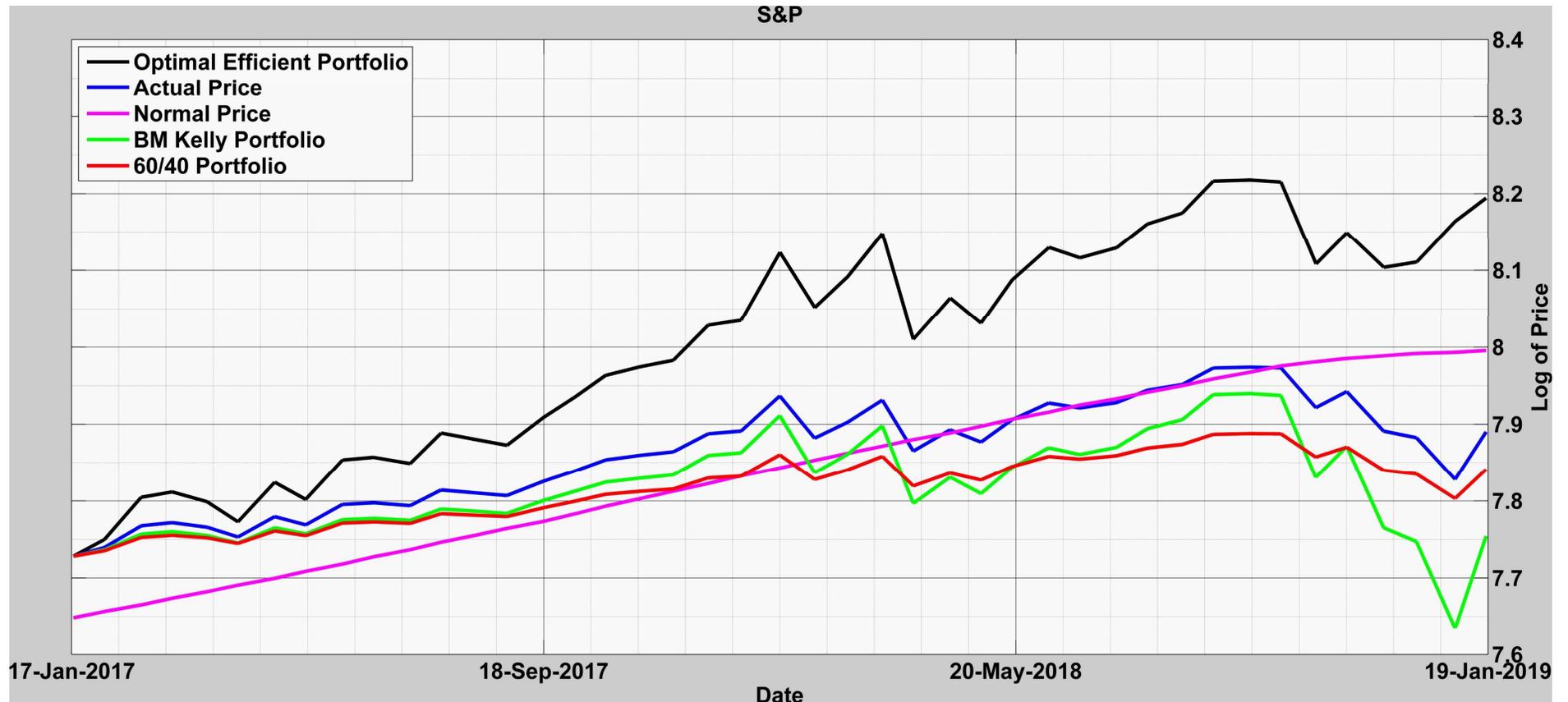
The signals are probabilistic. Bets are made based upon not only the probability but the size of the jump. Over several trials (rebalancing periods of two weeks) outperformance can be expected.

This method for determining bet size is known as Kelly. The crux of our technology is extending the Kelly method to asset prices with jumps AND where the distributions of jumps is dynamic and changes over time.

This provides the rationale for the outperformance of the optimal efficient portfolio.

The next graph shows what happened between December 31, 2018 and January 18, 2019.

The graph of the log of the asset price and normal price for S&P 500 extended to January 18, 2019.

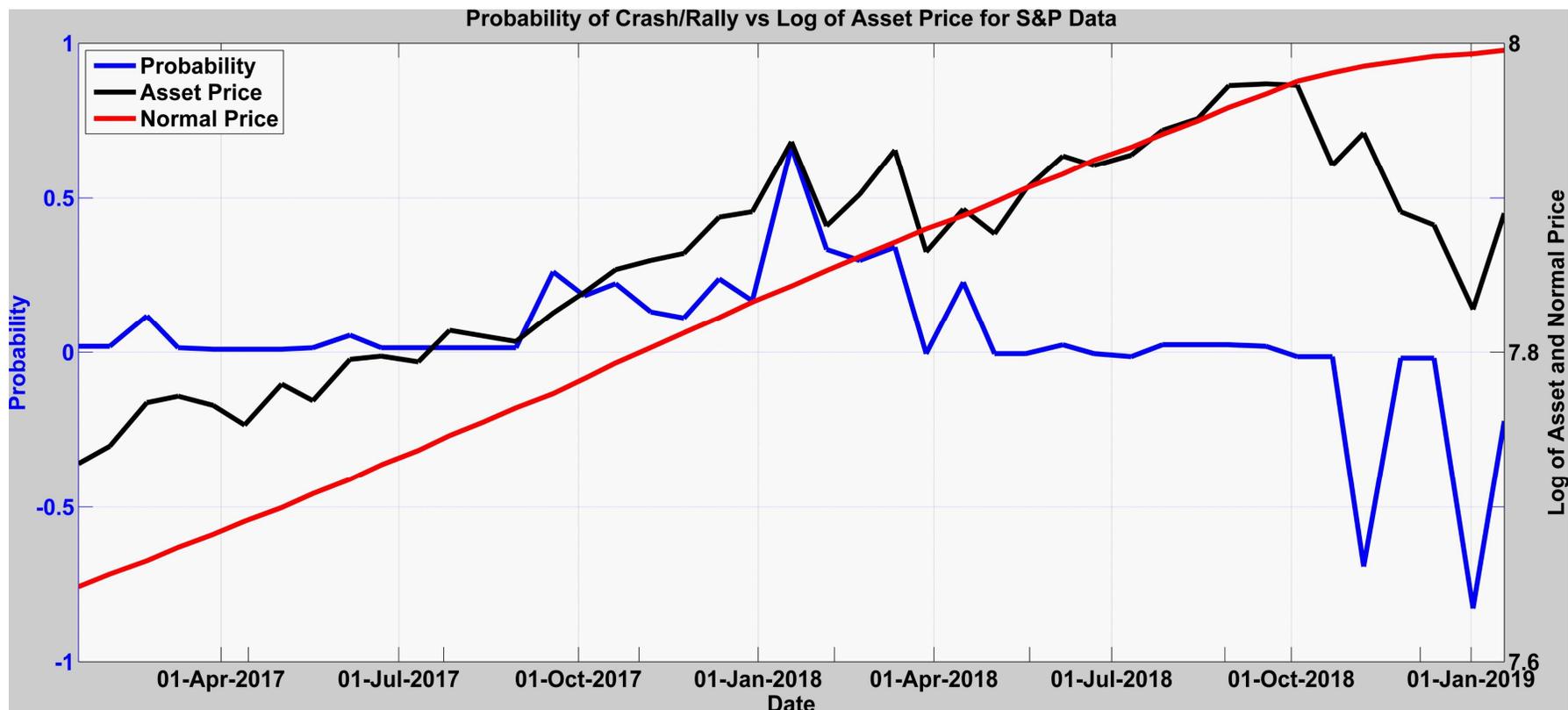


Notes on the graph.

- Note that the asset price is recovering after Dec 31.
- Also, the optimal efficient portfolio is moving in the same direction.
- See the next graph where the probability of a rally is very high (84%) prior to the upturn but then drops to 22%.
- Will the asset price move back to the normal price? We can't tell. But other measures point to the acceleration back to the normal price as slowing.
- **The probability signals worked. The method says invest more when the odds are in your favor and less when they are not.**
- But what about a crash? We give our opinion next.



The graph of the log of the asset price and normal price along with the probability of a crash or rally. Positive probability for a crash and negative for a rally.



We detect no signal for a sustained crash.
Rather an expected slow movement toward the normal price.

HOWEVER. Our analysis does not consider:

- FED trajectories
- Political risk and chaos
- Geopolitical tensions
- Trade issues and disputes
- Chinese slowdowns (recession)
- A rapid rise in global long-term real interest rates (we will be monitoring)
- Debt growth (we will be monitoring)

EXCEPT if any of these factors are embedded in the asset price.

Include Riskontroller as a part of your investment tool kit

- We will be telling you how to interpret and apply details of outputs including timing, size, probability, normal price return, expected returns from rational expectations condition, and other indicators.
- Crash mitigation and rally advantaging are critical in outperformance.
- We are developing apps for crash/rally alerts for major markets that can be customized to clients needs.
- Personal investors as well as institutional investors can profit from this technology.
- We continue research and development of this technology.
- Write us for more info : info@Riskontroller.com

Summary

- Our method is probabilistic.
- An outperforming portfolio that mitigates crashes and advantages rallies can be created.
- But we do not take into account all possible risks. The inputs to the current process are prices and we base our analysis solely on these price movements.

See <http://riskkontroller.com/info-center/> for several papers.

Our method may seem complex but it is only complex enough to solve the problem. Forecasting asset price movements is not simple - we make it as simple as possible but no simpler.

So keep in mind the cartoon on the next and last slide.

Thank you for your time

