# The Problem With Stock Asset Class Persistence

## MAXIMUM DRAW DOWN

In our paper ***Stock Asset Class Persistence*** we showed that stock asset classes exhibit positive and negative persistence. Specifically this means investing in last period's winner is a better investment approach than the traditional Buy and Hold and significantly better than investing in last period's loser. If you haven't read ***Stock Asset Class Persistence***, this would be a good time to familiarize yourself with what is meant by the term persistence and how it can be used as an investment style. It is a powerful concept observed repeatedly by traders and scientists. Many call it momentum or relative strength. We use the term persistence because while all three terms measure the past only the term persistence speaks to the future. Trends last longer than people expect. They are persistent.

Before we get to the problem with ***Stock Asset Class Persistence*** let's explore the reason why positive and negative persistence exists. Stock asset classes go through a divergence/convergence cycle when we measure their periodic rates of return. This divergence/convergence cycle can be measured in multiple time frames but always comparing short time frames to longer time frames. They diverge for short periods of time, measured in minutes and hours, but over longer periods of time, measured perhaps in days or weeks, they converge. Many people like to use the term **mean reversion** to explain this mechanism. Similarly, but using a longer initial time frame, they once again diverge for short periods of time, measured in months and years, but over longer periods of time, measured in decades and generations, they converge. This too is the mean reversion mechanism, just on a longer cycle.

We have analyzed the divergence/convergence cycle over multiple time periods and multiple parameters for individual stocks as well as stock and bond indices. We believe we understand the answers to the following questions. For example, does a 12 hour Follow the Leader Model exhibit the same characteristics or behave the same as a 12 day

Follow the Leader Model? Does a 10 month Follow the Leader Model produce the same results as a 200 day Follow the Leader Model? Does a 52 week behave the same as a 12 month? Does a 12 day work the same as a 12 month? Lastly, we analyzed what happens if you include just 2 assets in your ranking system, what we call a persistency pod, vs. 3, 4, 5 or more assets in your persistency pod. The results give us insight on how markets actually go through the mean reversion mechanism and the most effective time frames to trade markets using persistence . These results are proprietary. But we will give the reader a clue; one should not trade persistence the same way over each time frame. Persistence exhibits a tipping point. In our paper ***The Half Life of Stock Asset Price Persistence*** we tell you exactly how long a model that uses 1 year data lasts. Our research is easy to replicate if you wish to go down the avenue.

The rest of this paper will focus on persistence over the longest time frames we measure. For example, we can observe that in any 12-month period of time the best performing individual stock asset class can outperform the worst by more than 60%. Under this time frame, this is the short term divergence effect and routinely exceeds 30% per year. We can also observe that in any 20-year period of time this routinely observed 30% divergence is reduced to 1-3%. This is the convergence effect. Convergence simple means that over long periods of time, stock asset classes perform about the same. However, over short periods of time they don't. This is the divergence effect. Said differently, stock asset classes exhibit mean reversion over long time frames. The persistent investor takes advantage of the time disparity by investing in those stock asset classes that are positively trending or diverging from the others. To understand the reason persistence has worked in the past as well as why it will continue to work in the future, we suggest you read our paper entitled, ***Why Stock Asset Class Persistence Works***.

So what's the problem with buying positive persistence? It's observable, quantifiable, disciplined and outperforms a Buy and Hold strategy. The problem is large potential losses. The persistent stock asset class investor, just like the Buy and Hold investor, is always invested in stocks. Investors that are always fully invested in stocks are subject to large potential losses regardless of what approach they take towards stock market investing. Since the persistent investor is always invested in stocks and since our research shows that during periods of loses stock asset classes tend to diverge less than they do during periods of stock market gains, then the persistent investor loses their advantage during market downturns. Another way of saying the same thing is to say that in

market downturns, stock asset classes as well as stock investment styles become highly correlated. No one should dispute this finding especially after the market collapse that started at the tail end of 2007 and ended in early March 2009.

We like to measure these potential losses or risk through the metric Maximum Draw Down. It's how people measure risk and so do we. Maximum Draw Down is the best way to measure risk because it measures how people look at their money. Once an investor sees a particular dollar amount on their statement it is forever imprinted on their minds. This causes people to be much more concerned with their money during periods of market losses than periods of market gains. Modern Portfolio Theory or MPT would have the investor think that by measuring risk through the metric Standard Deviation that the investor experiences the same emotions during bull markets as well as bear markets. This is just not the case. Fear is a much stronger emotion than greed. MPT does not take this into consideration. Treating fear and greed as equal emotions is the major failing of using standard deviation as a risk metric. It has its place but not when it comes to measuring how investors assimilate risk.

Behavioral Finance has demonstrated that investors are more likely to overreact during losing periods than winning periods. This means they are much more likely to behave irrationally and sell their stocks at market bottoms than at market tops. This is especially true when you recognize that stock markets are much more volatile both positively and negatively during bear markets than in bull markets. See our paper entitled ***Market and Investor Behavior*** to understand the differences in volatility levels during bull and bear markets and to see when an investor is most likely to let irrational actions dictate their portfolio decisions. Despite its mathematics and conceptual elegance, MPT incorrectly attributes uniform emotions to the investor through market cycles. Maximum Draw Down captures the more prevalent investor emotion of fear and is why it is our preferred risk metric.

How do you calculate Maximum Draw Down? It is the highest percentage loss in a portfolio from peak to trough until the previous peak is exceeded. So what is the problem with stock asset class persistence? We found that stock asset class persistence does not do a good job in reducing Maximum Draw Down. In some case it does better than a Buy and Hold in others it doesn't. In either case, persistence is entirely inadequate when it comes to risk control. As a result, the strict use of

stock asset class persistence, as a stand-alone investment technique is suitable for only the most aggressive of investors. It outperforms Buy and Hold but in our opinion has an equal chance to be abandoned during market falls. However, it is a wonderful technique to marry with risk management techniques. When you do, you capture the advantage of out-performance and avoid the disadvantages of large maximum draw downs.

One of our investment solutions combines persistence and the risk management technique of long term moving averages to arrive at a solution that is more suitable to a broader range of investors as well as exhibiting a substantially better MAR Ratio. To calculate the MAR Ratio, divide the compounded annual growth rate, CAGR, of the investment approach since inception by the Maximum Draw Down, MDD, since inception. Our paper ***Long Term Simple Moving Averages as a Risk Control Techniqu***e shows why long-term simple moving averages are such a powerful tool to reduce Maximum Draw Down or risk and to increase the MAR Ratio.

Table 1 shows the Maximum Draw Down results for the same stock asset classes that we analyzed in ***Stock Asset Class Persistence*** and using the same methodology of investing in last year's leader. Once again, it is clear from the high Maximum Draw Down results for both the Buy and Hold investor as well as for the Persistent investor that both approaches are suitable for only aggressive investors.

**TABLE 1.** THE PROBLEM WITH STOCK ASSET CLASS PERSISTENCE (1979-2008)

| STOCK ASSET CLASSES | RATE OF RETURN (Buy/Hold) | MAXIMUM DRAW DOWN (Buy/Hold) | RATE OF RETURN (Leader) | MAXIMUM DRAW DOWN (Leader) |
|---|---|---|---|---|
| **S&P 500/EAFE** | 10.17% | 39.71% | 12.79% | 43.10% |
| **S&P 500/2000 Value** | 11.65% | 34.98% | 13.25% | 43.15% |
| **EAFE/2000 Value** | 11.21% | 36.07% | 15.62% | 43.10% |
| **S&P 500/EAFE/2000 Value** | 11.06% | 35.32% | 16.55% | 43.10% |

Earlier we introduced the MAR Ratio and Table 2 shows the results of dividing CAGR by MDD. If you divide the CAGR for the Buy and Hold strategy for the S&P 500 and EAFE we would divide 10.17% by the MDD of 39.71% to arrive at a MAR Ratio of .256. One of the effects that we've observed is that as we increase the number of asset classes and employ persistence, that MAR Ratios increase. There is a point however where the complexity of too many asset classes in a persistency pod causes the MAR Ratio to start declining. However the turbo boost in the MAR ratio comes from introducing a risk management technique such as a

long term simple moving average. In many cases and depending on the number and stock asset classes selected the MAR ratio can go over 1.0. This allows us to either transform the benefits of persistence so that investors that are more risk averse can utilize the strategy or if we choose employ leverage to increase our CAGR for the same level of MDD as without the risk management technique. Persistence in conjunction with risk management can serve many masters.

**TABLE 2.** RELATING RETURNS TO RISK

| STOCK ASSET CLASSES | MAR RATIO (Buy/Hold) | MAR RATIO (Persistence) |
|---|---|---|
| **S&P 500/EAFE** | .256 | .297 |
| **S&P 500/2000 Value** | .333 | .307 |
| **EAFE/2000 Value** | .311 | .362 |
| **S&P 500/EAFE/2000 Value** | .313 | .384 |