

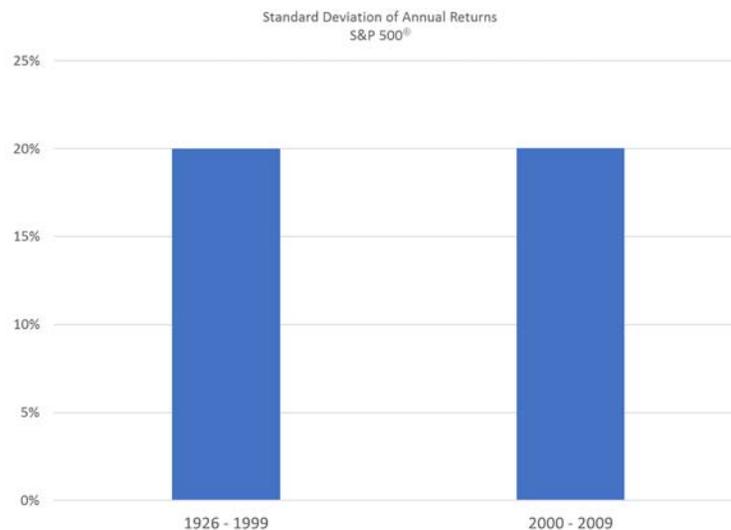


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Risk is dead. Long live downside risk.

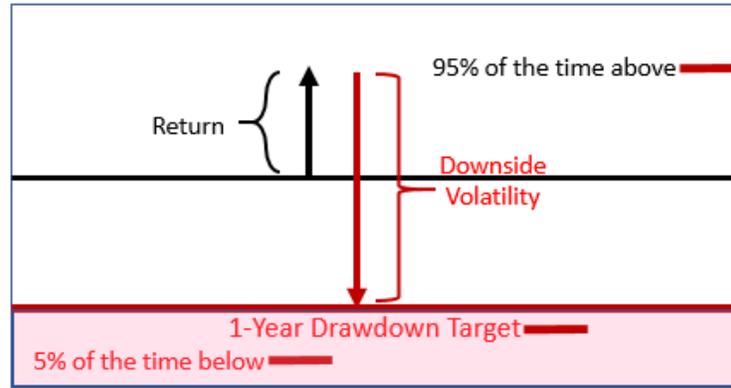
Last quarter every one of the asset classes that Frontier Asset Management tracks closely had a positive return. That only happened 5 previous times in the last twenty years. September marked the tenth month in a row that Frontier's Balanced strategy composite posted a positive return; that was its longest stretch since the 12 months in a row ending May 2007. The CBOE Volatility Index, or VIX, which measures the short-term annualized standard deviation of returns of the S&P 500[®] Index, has been under 10% on numerous days in 2017. The last time it was below 10% was in January 2007. On October 5th, the VIX closed at an all-time low of 9.19%. Risk is dead. Long live return. Or how soon investors forget. Did anyone notice that both of those "it hasn't happened since" were in 2007. Does anyone remember what happened in 2008?

We never forget about downside risk at Frontier Asset Management. Since the decade of the 00s didn't end that long ago and was a decade of two of the three worst bear markets of the past 70 years (the other being 1973-74), I thought it would be interesting to see how the volatility of the S&P 500[®] stock index stacked up against the volatility of the index prior to that terrible decade. Since most academics and by extension, institutional investors, view volatility and risk as the same thing, I thought the decade of the 00s would have much higher volatility than the earlier, 1926 – 1999 period. The chart below shows I was wrong.



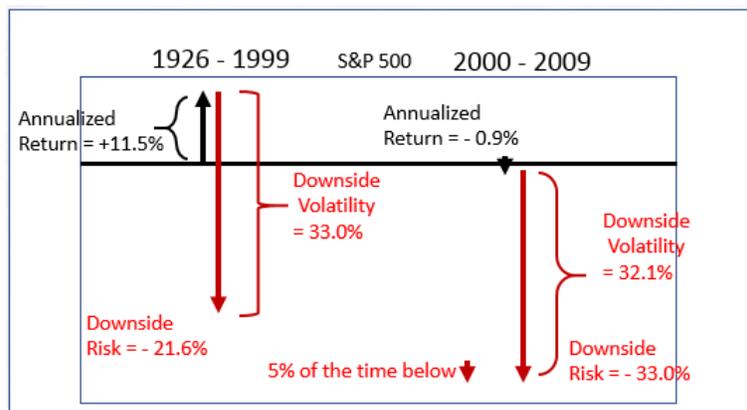
The two time periods both had standard deviations of annual returns of 20.0% (yes, we checked the math). Shocking! The 2000 – 2009 decade was obviously a riskier time period to be investing than the prior 75 years. Maybe standard deviation of returns is not a good measure of risk – at least not a good measure of how individual investors really think about risk. To investors, and to us at Frontier,

risk is more about losing money than it is about volatility of returns. That is why Frontier uses downside risk to define risk, not standard deviation of returns. Downside risk is the starting point when we design each of our strategies' target asset allocation mixes. The chart below shows how return and downside volatility work together to tell us what the 1-year prospective loss of a strategy might be.



The asset allocation mixes we develop each month try to maximize return while keeping the downside volatility low enough so that each strategy does not breach its 1-year drawdown target more than 5% of 1-year periods. At least that's in theory; we obviously cannot guarantee we will meet the downside risk goal, but our composite performance history since 1999 tends to support the idea that our downside first focus is working pretty well.

Now, let's take another look at those two periods that both had the same volatility of annual returns.



The use of downside risk tells the tale of these two time periods much better. The 1926 – 1999 period had an average annualized return of 11.5%, while the 2000 – 2009 decade actually had a *negative* annualized return of -0.9%. The volatilities around the averages were the same, but because the return of the 00s decade was so poor, the downside risk was much larger than for the previous period. So, regardless of what your college professor might have told you, the 2000s decade experienced much more risk than the prior 75 years. And your clients would certainly agree with that.

Conventional wisdom (the opposite of Frontier wisdom) designs portfolios with a constant asset allocation mix and claims that since the mix is constant, the portfolio risk associated with the mix is constant. That may be somewhat true if risk is defined by standard deviation of returns, but the chart above shows it is definitely not true if downside risk is your risk measure. We performed a simulation for the 20-year time period 1997 – 2016 of 2 portfolios. The first keeps a constant 60% stock / 40% bond mix month-by-month, while the second keeps a constant 10% downside risk target (1-year

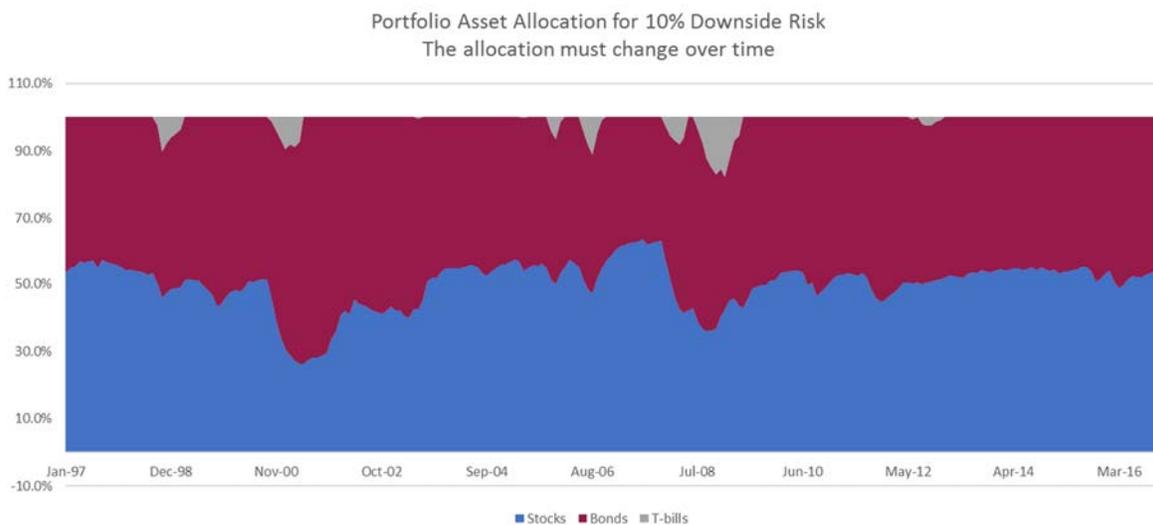
drawdowns to be less than 10% for 95% of the time). The second portfolio uses Frontier’s calculations for expected returns, downside risks, and correlations of stocks, bonds, and cash equivalents. We use the S&P 500® Index to represent stocks, the Bloomberg Barclays Aggregate Bond Index for bonds, and the Citi 3-month T-bill index for cash equivalents. Friends of Frontier know that the earnings yield of stocks is the theoretically correct real return expectation of stocks, and that interest rates of bonds, with some addition or subtraction from moving down the yield curve, is the theoretical nominal return expectation of bonds (so we subtract inflation to get the “real” return).

Return Expectations Can Change Dramatically Over Time



The primary reason stocks performed so poorly in the 00s decade is that the expected real return for the S&P 500® on January 1, 2000 was only 2.3%. The period around the tech bubble is the only period since 1926 when bonds had higher expected returns than stocks.

The chart below shows the changing asset allocation mix required to keep a constant 10% downside risk.

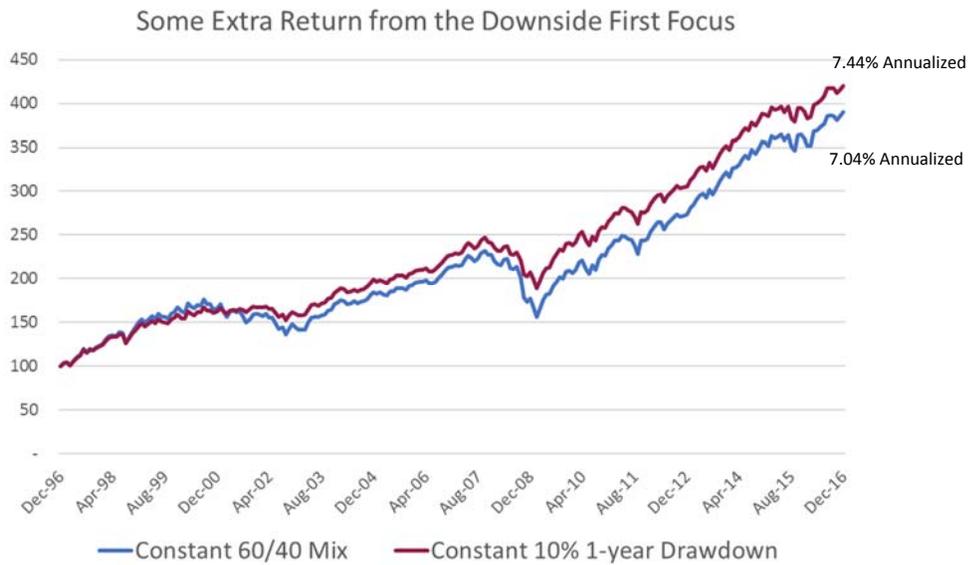


The asset allocation of the constant 10% downside risk portfolio changes over time because return expectations change – the higher the return expectations of stocks, the more the portfolio can hold and still keep its downside risk at target, all else being equal. Downside volatility expectations also

change – the higher the downside risk expectations, the fewer stocks the portfolio can hold, and the more negatively correlated stocks are to bonds, the more stocks can be held in the portfolio. Phew! We might want to read that again – there is a lot going on to calculate downside risk.

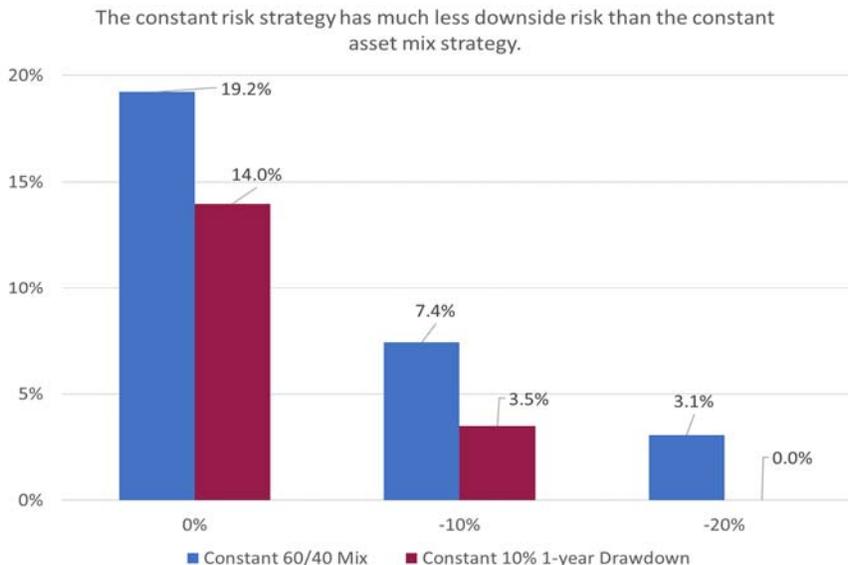
You can see in the graph below that not only was the 20-year return of the constant 10% downside risk portfolio higher than the constant asset allocation mix, it held up better during both major bear markets.

Constant 60/40 Stock/Bond Mix Vs Constant 1-Year 10% Drawdown Downside Risk



And when we look at every rolling one-year period, we see that the constant 60/40 asset mix has much more downside risk than the portfolio targeting 10% downside risk. Evidently, conventional wisdom is wrong.

Constant 60/40 Stock/Bond Mix Vs Constant 1-Year 10% Drawdown Downside Risk



So, why is all of this important?

- Clients are more interested in how much they can lose than the portfolio's standard deviation.
- If we target downside risk we are able to control it better than with a set asset allocation mix.
- Clients are more likely to stay invested through market downturns.
- Clients are more likely to meet their investment goals.

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Index	Index Description
S&P 500®	Represents US large company stocks. It is a market-value-weighted index of 500 stocks that are traded on the NYSE, AMEX, and NASDAQ
Barclays US Aggregate Bond	Measures the performance of the U.S. investment grade bonds market. The securities must have at least one year remaining to maturity, must be denominated in U.S. dollars and must be fixed rate, nonconvertible and taxable.
Citigroup 3-Month T-Bill	Represents the monthly return equivalents of yield averages for the last three 90-day T-Bill issues

Expected 95% Downside – The lowest return Frontier would expect to encounter over the next 12-months if all the monthly returns fell within 1.645 deviations (95% statistically confident range) of the expected real return.

Real Return – The annual percentage return realized on an investment, which is adjusted for changes in prices due to inflation or other external factors

Nominal Return – The annual percentage return realized on an investment before adjustments like inflation or fees.

Standard Deviation – A measure of the dispersion of a set of data from its mean. It is calculated as the square root of variance by determining the variation between each data point relative to the mean. If the data points are further from the mean, there is higher deviation within the data set.

VIX is the ticker symbol for the Chicago Board Options Exchange (CBOE) Volatility Index, which shows the market's expectation of 30-day volatility. It is constructed using the implied volatilities of a wide range of S&P 500 index options.

Frontier's performance is available on our website – www.frontierasset.com.

Frontier's ADV Brochure is available by request at info@frontierasset.com or 307.673.5675.