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## Part 2: It's All About the Fed...Almost

In Part 1, we examined the Fed rate policy, providing a historical recap and reviewing its effects on Insurance Company Bond Portfolios. This article, Part 2, will address the same for Equity/ Stock Portfolios. We provide a brief recap of part 1 for reference below:

Recap: With the Fed's extreme measures to stabilize the US Economy and to prevent a full economic depression in 2008, significant market distortions were created and knowingly tolerated. These distortions were caused by the massive liquidity injected into the US economy through interest rate policies as well as the purchasing of bonds by the central

bank. These strategies sought to improve market liquidity and to reflate the economy after the shock in 2007-08. While still suffering a recession, the economy did recover, but on a much slower track than it had after previous recessions. In fact, it took the S&P until third quarter 2012 to return to, and remain higher, than its fourth quarter 2007 peak. The NASDAQ was even slower in its recovery, not surpassing its 2007 peak until early 2013.

Today, we still see and feel the distortions from the extreme Fed policies of the past ten years.

*Continued on page 3*

## Economic Review

### Investment Perspectives

Tax cuts insulated the U.S. for much of 2018. As those benefits began to fade investors responded sharply, resulting in a plunge in risk assets to close the year. Entering 2019, markets have priced in an elevated risk of imminent U.S. recession – an outlook that is not currently supported by slowing, but still positive, fundamentals.

### End of Year Plunge Left Few Places to Hide in 2018

After three quarters of positive returns, 4Q's significant risk-off move left investors with few places to hide. For the first time in 45 years, no major asset class experienced an annual return greater than 5%. Cash was the best-performing asset class, and the median major asset class return was down over -7% – the weakest performance since the Financial Crisis.

Global growth has slowed amid the strong U.S. dollar, Federal Reserve (Fed) tightening, rising tariffs and a slowing

*Continued on page 2*

	4Q 2018 Takeaways	Outlook
MACRO	<ul style="list-style-type: none"> <li>Global growth cooled, led by China</li> <li>U.S. economy came off the tax-cut boil</li> <li>Oil collapse weighed on inflation</li> <li>Monetary policy normalization continued – with the exception of China</li> </ul>	<ul style="list-style-type: none"> <li>Modest global expansion persists, despite rising headwinds</li> <li>U.S. recouples with rest of the world</li> <li>Core inflation firms, headline weakens</li> <li>Global central bank policy becomes restrictive</li> </ul>
MARKETS	<ul style="list-style-type: none"> <li>Widespread uncertainty drove a volatility surge and plunge in risk assets</li> <li>No major asset class posted a meaningful gain in 2018</li> </ul>	<ul style="list-style-type: none"> <li>Policy uncertainty and monetary tightening remain headwinds</li> <li>Equities rebound as market adjusts to slower, but still positive, fundamentals</li> </ul>

U.S. Equities	4Q 2018 (%)	2018 (%)	Fixed Income	4Q 2018 (%)	2018 (%)
U.S. Large Cap Stocks	-13.5%	-4.4%	High Yield Bonds	-4.5%	-2.1%
U.S. Mid Cap Stocks	-15.4%	-9.1%	Emerging Market Bonds	-1.2%	-4.6%
U.S. Small Cap Stocks	-20.2%	-11.0%	Investment Grade Bonds	-0.2%	-2.5%
			Long Duration Treasury Bonds	2.6%	0.9%
International Equities	4Q 2018 (%)	2018 (%)	Alternatives	4Q 2018 (%)	2018 (%)
Non-U.S. Developed Market Stocks	-12.5%	-13.8%	Real Estate Stocks	-6.1%	-4.0%
Non-U.S. Small Cap Stocks	-16.0%	-17.9%	Commodities	-9.4%	-11.2%
Emerging Market Stocks	-7.5%	-14.6%	Gold	7.2%	-2.8%

Source: Bloomberg Finance, L.P., Boston Advisors, as of 12/31/18

# Economic Review



Peter Anderson is the Executive Vice President, Chief Marketing Officer and Director of Business Development for Boston Advisors. He is responsible for the management of Sales,

Client Service, Consultant Relations, Marketing and PR of the firm's strategies globally.

China. While the Fed may slow its pace of tightening going forward – which would be a positive for global growth – many other central banks are stepping in to fill the void. Modest growth in 2019 seems the most likely result.

The U.S. is slowing as 2018's tax-cut sugar high wears off – as evidenced by the recent deterioration in leading economic indicators. It remains unclear if this slowdown will ultimately stabilize (as in 2012 and 2016) or turn negative and

lead to a recession (as in 1989, 2000 and 2006). But the still highly positive current growth rate suggests low 2019 recession odds.

### What Are the Downside – and Upside – Risks to the 2019 Outlook?

There is a wide-range of potential outcomes around the base case outlook. One downside risk to monitor: markets are pricing in elevated 2019 recession odds, which can become self-fulfilling if consumer and business spending declines in response. One upside risk: rising corporate investment could lead to better-than-expected productivity – and profit – growth in 2019

Monetary tightening and the global economic slowdown are likely to lead to slower revenue growth for U.S. companies. At the same time, rising wages and interest rates are also pressuring margins. Low-to-mid single digit profit growth seems the likely result. However, there is the potential for a more significant market snapback if investor sentiment improves.

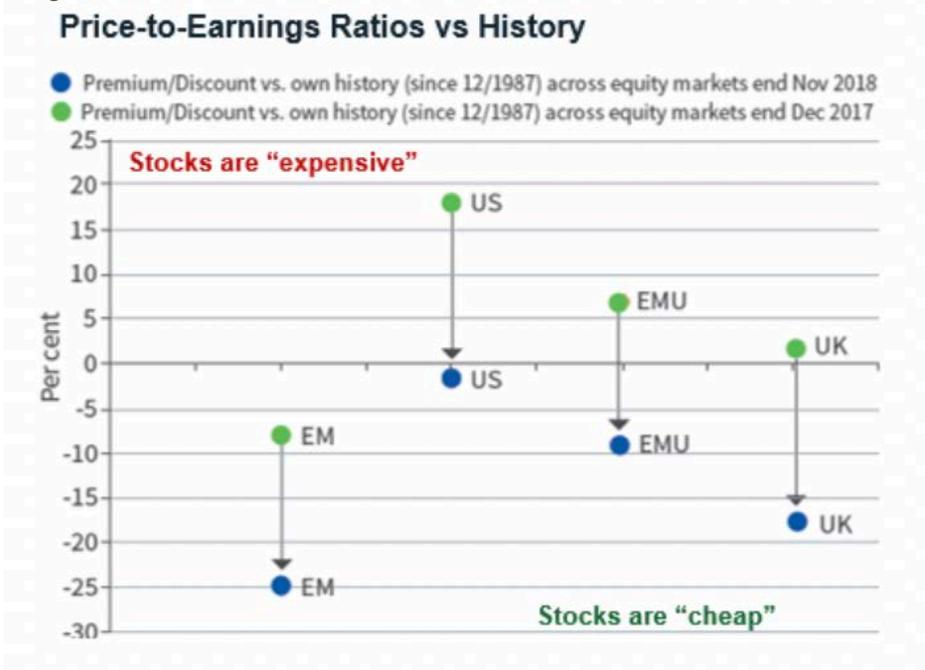
The dollar is historically expensive and emerging market equities are historically cheap. While valuations alone are not catalysts for returns, they suggest upside if the news turns more positive – which could happen in 2019.

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Figure 1

Indicators	Implied 12-month Recession Probability
Corporate Bond Market	38%
Stock Market	57%
Treasury Market	50%
Corporate Bond and Stock Market	70%
All Three Markets Combined	89%

Figure 2



(Figure 1) Corporate bond market calculated based on deviation of A-BBB spread from two-year average. Stock market calculated as percentage drawdown from peak. Treasury market calculated as difference between 10-year and 3-month yields. Source: JPMorgan, Boston Advisors, as of 1/4/19.

(Figure 2) EMU: European Monetary Union. EM: Emerging Markets. Price-to-earnings ratio (P/E): Stock price divided by earnings. Also known as the multiple, P/E gives investors an idea of how much they are paying for a company's earnings power. Source: Aviva Investors, Thomson Reuters Datastream, Boston Advisors, as of 11/30/18.

## Economic Review

### Fixed Income Outlook Weakening, but Still Favor Credit over Treasuries

U.S. corporate spreads have widened and treasuries have rallied in sympathy with the equity market plunge, resulting in a partial inversion of the yield curve. Both trends suggest fixed income investors are increasingly cautious about the U.S. economic outlook, but if a recession doesn't occur then corporate bonds will likely outperform Treasuries.

### Myopic Loss Aversion Prompts Risk-Averse Behavior

*In conclusion....a word of caution...*  
**Myopic loss aversion** is an investor bias in which greater sensitivity to losses than to gains is compounded by the frequent evaluation of outcomes. During periods of market volatility, investors who review portfolios more frequently have tended to shift toward more conservative exposures,

potentially hindering their ability to achieve their longer-term investment goals. □

## Part 2: It's All About the Fed...Almost

Just as with Bonds, the Fed's drastic measures of maintaining near zero rates had profound effects on the US stock market. The sustained low bond interest rate environment provided support for a long bull market cycle in equities since investors had to have a "risk-on" position to enjoy positive "real" (after inflation) returns. While stocks made a frustratingly slow emergence from the depths of great recession and market crash, 9/07-2/09, with an S&P 500 intra-year drawdown exceeding 45%, their fairly steady rise was heavily supported by monetary policy.

On December 29, 2008 the Fed rate dropped to .08% (8 BPs), During the many ensuing years when interest rates remained near zero and/or at historical lows near zero, insurers and other investors relying on income generated from bond portfolios needed to find supplemental sources of current income/cash flow. Dividend Achievers or Dividend Aristocrat strategies, those concentrating stock holdings in companies with increasing dividend distributions, were undertaken to supplement meager bond portfolio cash flows with dividend income that often exceeded bond yields. Other market dynamics, particularly the advent of rapid growth in the tech sector, also spurred a "risk-on" environment in which insurers also increased equity holdings for returns through attractive price appreciation opportunities.

Fed rate policy helped stabilize and calm stock markets, marked by lower volatility levels, but generally encouraged risk taking behaviors. The low volatility levels and steady market climb were in large part due to capital inflows to the stock market by investors, including insurers, seeking returns that exceeded those available in the bond market. Interest rates that remained below the inflation rate required investors to seek "real" returns elsewhere, namely riskier bonds, stocks, etc.

**“With the possibility of the long bull market cycle winding down, we should expect additional market volatility until such time that the equity market cycle reveals its direction.”**

However, steady positive returns reaped by equity market investors over these past 10 or so years did not reduce underlying stock market risks. For at least the last three years, Wall Street "perma-bears" have called for a major correction, or worse. This began when they identified the developing bubble in the high dividend stocks a few years ago. More recently, these

voices have multiplied and become significantly louder and more ominous stating that this equity bull market was extraordinarily long and perhaps overdue for a fall. For evidence, they pointed to an overpriced stock market with historically high P/E and CAPE ratios<sup>1</sup> that seemed to signal trouble. Even the bulls were forced to recognize that this second longest bull market must be in its "late innings".

### And, so here we are today

In early 2018, we had our first taste of the return of market volatility with a US stock market correction. However, with the economy still building strength and overall market sentiment strong, it seemed to present nothing more than another "buy the dip" opportunity. In fact, the S&P 500 made strong progress for the year through 9/30/18 rewarding those who added to their positions during the early retracement. However, as we all know, in the fourth quarter 2018, the US stock market was severely punished. For example, the S&P 500, the index that tracks the stocks of 500 large-cap U.S. companies, lost 13.52% in the 4th quarter of 2018, resulting in a 4.38% loss for the year. This period of volatility resulted in even larger losses in the once high-flying tech sector.

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## Part 2: It's All About the Fed... Almost

2019 seems to have ushered in a new strategy for the Fed as they have expressed a new dovish stance, which represents a 180-degree turnaround from their December position. This new position may reflect the realization, or fear, that over-tightening the money supply with continued interest rate hikes planned for 2019, could serve to more quickly escort the US economy into recession. And the Fed has a history of doing just that! Witnessing the market's response to their interest rate positioning late last year may have helped convince them to take their foot off the gas pedal of rate increases. In any event, this new positioning, a dovish stance, has helped January to provide a bit of a rebound in the US equity markets.

As you can see from the figure 1, which spans for 2/4/2018 - 2/4/2019, the rebound in January put the index at 2722, which is near where it was a year ago at 2741.

2019 still faces significant headwinds with global trade issues and the expected GDP slow-downs. Therefore, some market pundits predicted that the 4th quarter market performance was just the opening act for another market drop; one as major as a 40% downdraft. Others viewed the last quarter correction as healthy step required to bring P/E and CAPE ratios back towards more historically normal ranges.

It doesn't matter if the pundits, bears or bulls, are correct at any given time. The fact remains that the market is always cyclical and will drop after periods of gains, eventually. Insurers must use their "surplus" portfolios wisely and apply a long-term view to their asset classes. Since the surplus component receives the lion's share of a client's risk budget, the risks associated with each asset class utilized must be carefully weighed and frequently reevaluated.

### Looking Ahead

With the possibility of the long bull market cycle winding down, we should expect additional market volatility until such time



**Figure 1**

that the equity market cycle reveals its direction. Accordingly, insurers are asking if they should reassess their risk exposure to equities. The short answer is yes. Any cyclical change anticipated should generate a discussion of risk appetite since what worked in one cycle will seldom generate similar returns in the new cycle. As such, many of our clients are reassessing risk tolerance for the surplus portfolios and asking how they may reappportion some or all of that exposure more defensively.

Such defensive equity strategies come in many flavors but in each case the market value protection they provide comes at a cost. These costs usually represent a trade off of market upside price appreciation for downside protection. For example, many insurers utilize Covered Call Writing Programs. These programs limit appreciation since stocks are "called away" when the market prices surge upward, capping their upside gains. However, when the equity market tanks, the premiums collected on the sales of the call options, which alternatively can be used to supplement current income, may also serve to offset market value declines buffering losses.

Full-fledged hedging strategies,

typically used by separate account, active investment managers as well as Hedge Funds, are typically much more complex and can also be used to manage and moderate the equity portfolio's returns and associated risks. These strategies vary from just a few hedges within a long-only equity portfolio to include a variety of Long/Short, Multi-Strat, Arbitrage, Event Driven and Global Macro Hedge funds, with heavy usage of various derivatives strategies. However, these strategies are typically significantly more costly and are a bit riskier as compare to covered call writing programs. In fact, for commercial insurers, they typically also require the insurer to file a derivatives usage plan with their state regulators.

Another defensive equity strategy could be to consider "Quantitative or Black Box" strategies designed to select stocks through the use of technology-based algorithmic modeling to build fairly concentrated, rather than fully diversified, portfolios. Typically, these portfolios will consist of 40-60 S&P 500 stocks and are engineered to behave in a manner to capture about 80-90% of the market's upside and limit downside losses to 50-70% of the overall market's loss. While clients are often concerned that the actual trading processes are not disclosed by the manager, hence "black box", we have

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seen that many of these strategies perform as advertised.

### In summary...

Whether through a quant strategy, a hedge fund or conducted at a customized portfolio, separate account trading level, these strategies can serve to provide market downside protection. Any strategies that can dampen portfolio volatility and buffer downside market losses can be important strategies for an insurer to consider at this time.

Covered call writing, options/hedging

and quant strategies can all provide the asymmetrical relationship with the market's ups and downs that is desired by Insurers seeking to de-risk a portion of their equity exposures.

A final note: As rates continue to rise, insurers should also pay closer attention to their bond manager's performance. For so many years, with rates near zero, the spread between the best and worst bond managers was compressed, lulling insurers into a more apathetic approach to bond manager performance evaluations.

Spreads between the best and worst bond managers will widen with the rise in interest rates and insurers looking to optimize their bond portfolio results should start sharpening their pencils.

1 The P/E ratio is the price-to-earnings ratio; a ratio for valuing a company that measures its current share price relative to its per-share earnings (EPS). The CAPE (Cyclically Adjusted Price-to-Earnings) Ratio is a valuation measure that uses real earnings per share (EPS) over a 10-year period to smooth out fluctuations in corporate profits that occur over different periods of a business cycle. Source: Investopedia. In the context of this article, both these ratios are applied to broad equity indices, rather than individual stocks, to assess whether the market is undervalued or overvalued.

## What is Risk?



David Page, since 2012, has been Chairman and Chief Executive officer, Boston Harbor. He has over 30 years of experience creating, building, and managing technology organizations.

His track record of success spans the founding of two start-ups IDEAssociates and EnvoyWorldWide; two leverage buyouts Alcatel Data Systems and Network Solutions, and the restructuring and sale of Tribotek to Methode Electronics. Most recently Mr. Page has advised several start-ups: iAMscientist, Eetrex, iGigaplex, Rock Solid Produce, Sagewell and the non-profit organization, YES | youth | entrepreneurship | sustainability.

### Introduction

2018 reintroduced many insurers to market volatility first in February and then again in the fourth quarter. The stock market's plunge at year end has many insurers reassessing portfolio risks.

Read any Prospectus and the investor is confronted with a laundry list of possible risks. Yet the typical institutional investor has no definitive method to systematically evaluate those risks and assess their potential impact on the institution's investment portfolio.

When considering risk, the fundamental risk that an institutional investor needs to assess is the Risk of Permanent Loss of Capital: a Bond, Stock or Fund declines in value and does not recover or does not recover as of the time when invested funds are needed for another purpose.

The standard method for assessing the Risk of Permanent Loss of Capital for Fixed Income investments is different from Equity Investments. Investment grade fixed income assets

are rated by Credit Rating Agencies which assess and classify the risk of each Bond offering. In contrast for equity portfolios volatility of stock price is commonly used to assess risk. It is the foundation for most equity risk assessment methods. Credit Rating and Volatility are completely different methods for evaluating risk of loss.

We will briefly review Fixed Income Risk Assessment and then compare it to Equity Risk Assessment. In doing so, we will establish a methodology for Institutional Equity Investors to assess the Risk of Permanent Loss of Capital.

### Fixed Income - Evaluating Risk of Permanent Loss of Capital

Investment grade bonds are typically the mainstay of insurance portfolios as they are used to create a "reserve" portfolio; one that is ready to support the insurer's claims paying ability. While there are several risks applicable to an insurer's bond portfolio, the two main risk factors are credit risk and interest rate risk. Whereas interest rate risk becomes important if a bond is sold prior to maturity, credit risk exposes the insurance

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## What is Risk?

company to non-discretionary permanent loss of capital.

Between the three major Credit Rating Agencies Standard & Poor's, Moody's and Fitch Group, for investment grade bond issuers, there is an ongoing assessment of default risk: the risk that the issuer will not make the required principal or interest payments. Although there is no estimate of the default risk for any individual bond rating, history is an indicator of default risk (see Table 1).

As expected the default rates for any specific Bond rating category increases over time (see Table 2).

In addition a bond can be re-rated based on changing circumstances of the issuer. For instance General Electric Corporation Standard and Poor's Senior Bonds declined from AAA in Q4 2018: to BBB+ in Q4 2018 putting GE senior credit close to non-investment grade credit.

Bond ratings are a good indicator of the probability of risk. Therefore, for any bond duration the relative interest rate is consistent with the rating and the probability of default (see table 3). (We assume the investor matches assets and liabilities over time to minimize interest rate risk market impact.)<sup>2</sup> The investor can assess whether the differential interest rate is an acceptable trade off to the added risk. Of course a diversified bond portfolio significantly reduces the impact in the event of an actual default. The portfolio negative impact can be expressed: Permanent Loss of Capital =  $(\text{Bond Par Value} \times \text{Default Risk}) \times (1 - \text{Recovery Rate})$ .

### Equity Risk - Volatility

There is a fundamental difference between equity and fixed income investments. With fixed income securities there is a contractual obligation to redeem the bond at the end of term at the face value.<sup>3</sup> The

Table 1

Average One-Year U.S. Default Rate (1981 – 2017) (by Rating Category)

Rating	AAA	AA	A	BBB	BB	B	CCC/C
Average % One-Year U.S. Corporate Default Rate	0.00	0.03	0.07	0.21	0.78	3.78	28.79

Source: S&P Global Ratings 2017 Annual Global Corporate Default Study and Ratings Transitions April 18, 2018 page 59 Table 25

Table 2

Average Cumulative Default Rates for U.S. Corporates (1981 – 2017)

Rating/Years (%)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
AAA	0.00	0.04	0.17	0.29	0.41	0.54	0.58	0.66	0.75	0.84	0.88	0.93	0.98	1.07	1.17
BBB	0.21	0.56	0.95	1.44	1.97	2.50	2.97	3.44	3.90	4.35	4.80	5.14	5.45	5.79	6.14

Source: S&P Global Ratings 2017 Annual Global Corporate Default Study and Ratings Transitions April 18, 2018 page 59 Table 25

Note: Default Year based on date of original rating and rerating transition date see Iblid Appendix I Methodology & Definitions page 68

Table 3

Index	U.S Gov/Credit	AA	BBB	U.S. High Yield	CCC
Current Yield (%)	3.100	3.220	4.280	6.704	12.155

Source: Wall Street Journal Tracking Bond Benchmarks January 31, 2019

risk of permanent loss of capital to the investor is risk of redemption failure. In contrast, the risk of permanent loss of capital for equities is dependent on the accounting loss or whether the shareholder can sell their stock at a price equal to or higher than the purchase price or previous prior peak (the investor capital). Using portfolio performance as the measure the risk of permanent loss of capital is related to Maximum Peak-To-Trough Drawdown. For example, at the portfolio peak value an insurance company can be solvent and at the Maximum Drawdown value insolvent.

Whereas fixed income investors can rely on Credit Agency assessment of issuer credit risk, for equity investors there is no such agency. Instead Std deviation of returns (change in price) or volatility is used as a measure of risk. However, volatility is exclusively an indicator of the changes in price (value) of a public traded security over some period of time.

Changes in the price (value) of a stock are directly related to the level of agreement between buyers and sellers. When there are many buyers and sellers, an efficient market, with a

general consensus on the value of a stock, the percentage changes in prices are low. As disagreement in the value of a stock increases the percentage change in price will increase, increasing the volatility.

Volatility is only a measure of changes in price not direction (see chart 1)

In Chart 1 on page 7 there is no difference in volatility for either the increasing or decreasing step functions, or the oscillating function. This is because the distance from the mean for each of the data points is identical (regardless of sequence). The volatility of the decreasing line function is less, 1.6% vs. 2.6% because all of the interim data points are closer to the mean.

In conclusion, volatility is as measure of change (in this case change in stock prices). As demonstrated, whether positive

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<sup>1</sup> S&P downgrades GE's credit rating, Moody's, Fitch put it on review - Reuters October 2, 2018; GE loses its top credit rating - Matt Kranz & USA TODAY March 13, 2009

<sup>2</sup> Insurers also need to gauge the interest rate risk (bond or portfolio duration) under the assumption that the bond(s) may not be held to maturity. That is, the default rate in addition the changes in market value should that bond need to be liquidated to pay claims.

<sup>3</sup> It should be noted that there is a risk that interest payments on bonds (which insurers rely on for operating expense) or dividends on stocks that are not paid, a cash flow risk.

# What is Risk?

Chart 1

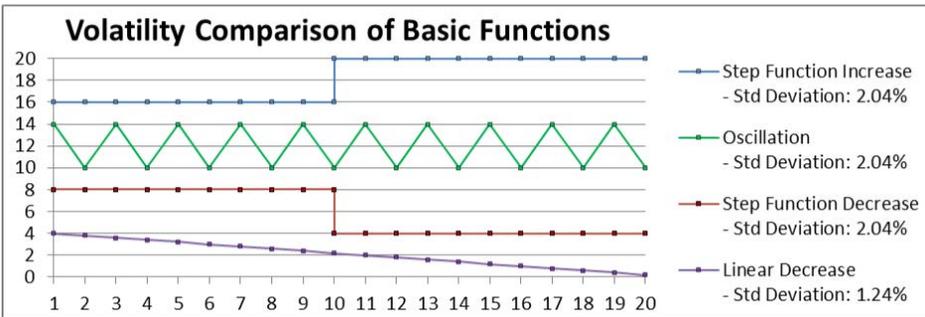
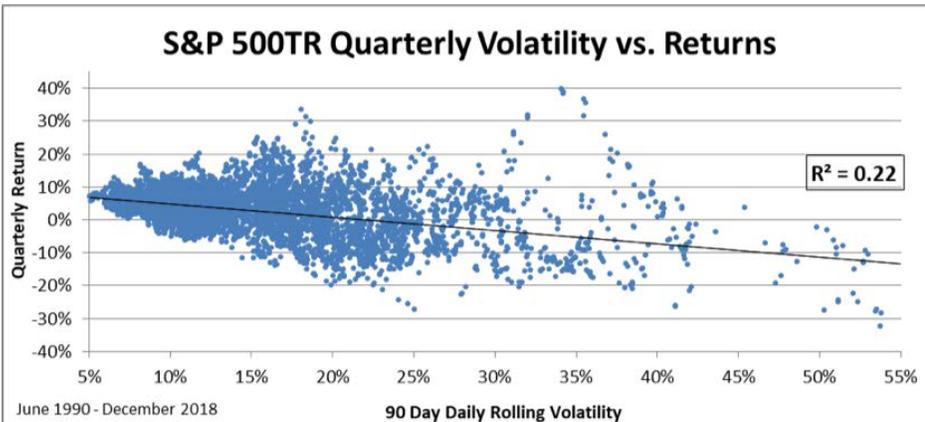
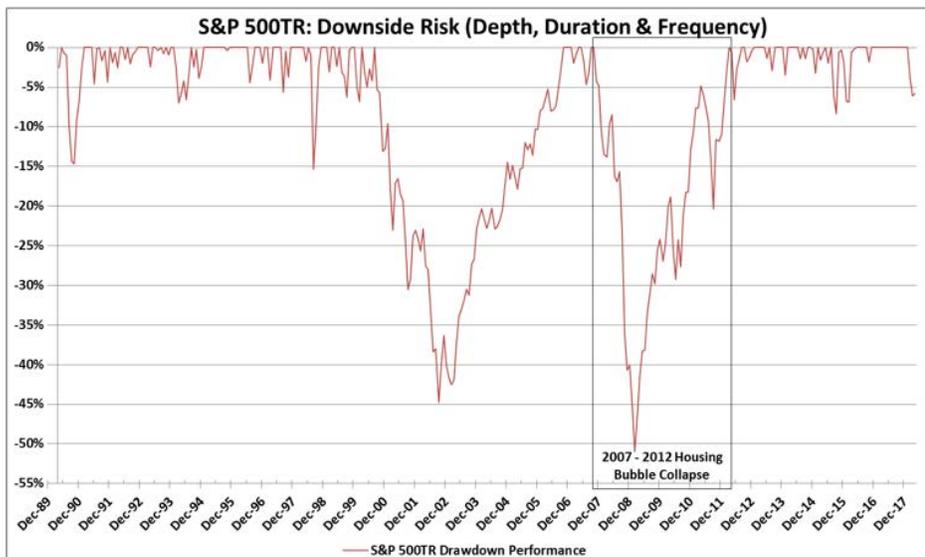


Chart 2



Source: S&P 500TR Index Daily Closing Value - Morningstar

Chart 3



Source: Morningstar Data January 2019

or negative, volatility is a measure of the size and frequency of change. Volatility is only a measure of risk in so far as it is an indicator that the market is unsure of the value of the stock and the degree of that uncertainty. In fact volatility is uncorrelated with return (changes in price) (see chart 2).

In chart 2 we compare the S&P 500TR Index 90 day-daily rolling volatility vs. the rolling quarterly return calculated daily. The slope of the linear regression line and the R2 of 0.22 demonstrates that there is almost no relationship between volatility and return for the S&P 500TR Index.

In conclusion and in contrast to Agency Credit Ratings, volatility is a poor indicator for assessing the risk of permanent loss of capital.

### Equity Investors - Assessing the Risk of Permanent Loss of Capital

Without Put Option insurance (which can significantly decrease returns) there is clearly no concept of contractual common stock redemption. Therefore, the stock portfolio is critical for mitigating idiosyncratic risk. The investor's portfolio is the mechanism that must automatically protect capital when bad things happen to the market. The range for the number of stocks for a fully diversified portfolio is typically 20 to 60 for non-speculative quality stock positions<sup>4</sup>. The failure of any one stock to perform or incur a loss is mitigated by the remaining stocks in the portfolio.

For an equity portfolio there are two important related factors for assessing the permanent loss of capital risk.

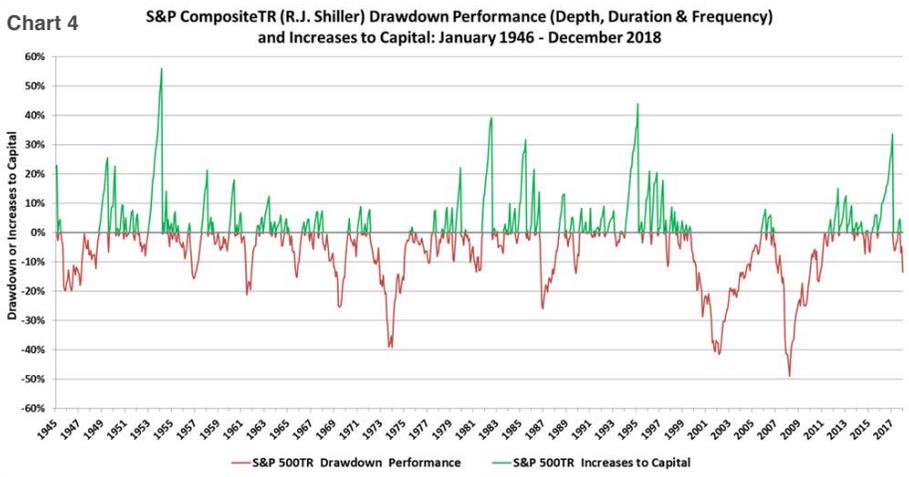
- 1. Maximum Peak-To-Trough Draw-downs** - Over at least one full market cycle what is the depth of the decline (Maximum Draw-down)? For instance the Maximum Draw-down for the S&P 500TR over the last full

Continued on page 8

<sup>4</sup> A Random Walk Down Wall Street, Burton G. Malkiel, 2015, page 212 (first published 1973)

<sup>5</sup> Drawdown is the percentage decline of the stock market value from its prior peak to the point of maximum loss, prior to recovery

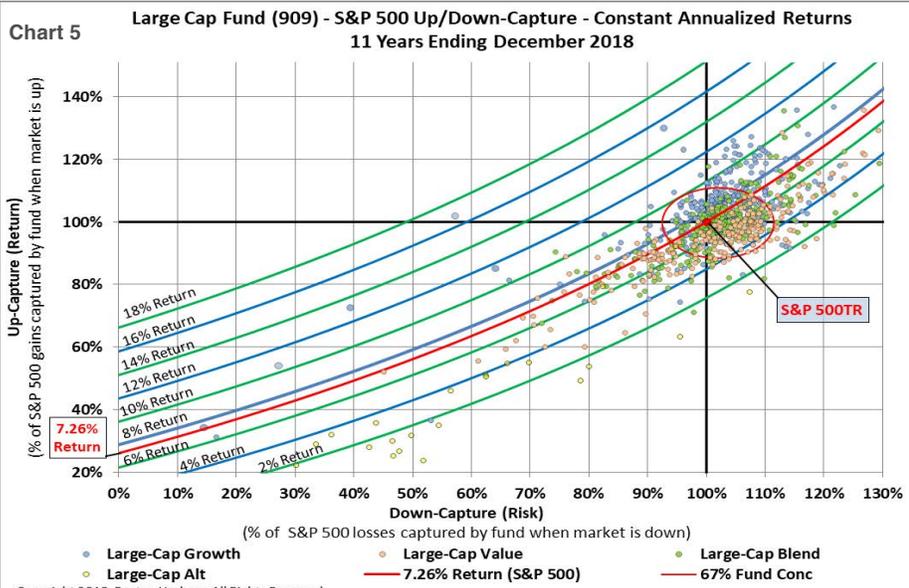
# What is Risk?



Source: S&P Composite, P/E 10 or CAPE Data Used in "Irrational Exuberance" Princeton University Press, 2000, 2005, 2015, Updated Robert Shiller [www.econ.yale.edu/~shiller/data/ie\\_data.xls](http://www.econ.yale.edu/~shiller/data/ie_data.xls), Nominal Price Index & Dividends Combined to Calculate Total Return

In the chart above the red (negative) sections represent the periods in which the S&P 500TR declined and was 'underwater'. The green (positive) sections represent the periods in which the S&P 500TR was advancing. Please note that the S&P 500TR (the market) is underwater more than half the time.

**Constant Return Chart 5 Description:**  
Up-Capture (Return) is the % of S&P 500 gains captured by fund when the market is up. Down-Capture (Risk) is the % of S&P 500 losses captured by fund when the market is down.  
 Each constant return line represents all combinations of Up-Capture and Down-Capture that will generate that specific return.  
 The Constant Return chart is based on a Fund's capture of S&P 500 up-gains & down-losses over a full market cycle (11 years).  
 Up-Capture/Down-Capture is the context to examine, using observed data, a definitive relationship between the S&P 500 Index and every Large-Cap equity fund strategy (909) in the Morningstar database in existence for the past 11 years.  
 For example, a 10% return can be generated by 60% Up-Capture and 40% Down-Capture or 120% Up-Capture and ~106% Down-Capture.



Source: Morningstar Data January 2019 (Charts 5, 6 & 7), All Fund Data Points Based on Lowest Fee Class as Reported

market cycle (Initial Peak to Trough) was -50.9% (see chart 3). An investor at the peak near the end of 2007 would have lost over half of their portfolio value.

**2. Maximum Draw-down Duration -**  
 Over the last full market cycle what was the total elapsed time to recovery (Peak to Trough back to the former Peak value). This is the time 'under water'. If the investor had to liquidate the portfolio during this period there would be a permanent loss of capital. The Maximum Draw-down Duration for the S&P 500TR for this last market cycle was 58 months (4.83 years) see chart 2. In order to avoid the permanent loss of capital the S&P 500TR investor would have to hold the portfolio for that 58 month period.

Since 1945, for the S&P Composite, there were 7 Bear markets, declines greater than 20% (see chart 4). These declines occur approximately once every 10 years. Although the long term annualized return over the 73 year period is 10.6%, as one can see, the returns are episodic exposing the investor to significant risk. The equity portfolio exposure to systemic, market driven Maximum Drawdown and Duration risk is the primary Risk to Permanent Loss of Capital.

**Portfolio outperformance during a negative market cycle can drive outperformance with less risk.**

Systematic portfolio strategies that demonstrate performance over at least one full market cycle provide an example of the Maximum Drawdown, Frequency and Duration that is necessary to evaluate the Risk of Permanent Loss of Capital.

*Continued on page 9*

## What is Risk?

### Evaluation - Large Cap Funds Maximum Drawdown Risk

How do the 904 Large Cap Funds perform over the current full market cycle since the end of 2017? The majority of Funds are clustered around the S&P 500TR with Up-Capture/Down-Capture within 1 std deviation (see chart 5).

In examining the constant return lines investors can see that strategies with similar returns have completely different draw-down risk characteristics. For example, in the 2008-2009 financial

collapse the S&P 500 drawdown was -51%. Therefore, for a 7.3% return, at 70% Down-Capture, the drawdown-risk expectation is -36% vs. at 110% Down-Capture the drawdown-risk expectation is -56%.

**Most importantly, by seeking strategies with lower Down-Capture, investors can decrease risk while seeking an appropriate return.**

Comparing Volatility to Maximum Drawdown over, from scatter plot (chart

6) below there are several interesting observations. The volatility range is much wider than the maximum drawdown. Maximum drawdowns are clustered around -50% close to the S&P 500TR drawdown (-51%). Volatility over 13% almost always insures a maximum drawdown over -40%. There are few funds with maximum drawdowns less than -40%. With an R2 of 0.35, volatility is not a good statistic for selecting Funds with low Drawdown Risk. In addition, with an R2 of 0.003 there is no relationship between Volatility and Maximum Drawdown Duration.

In contrast, comparing Down-Capture to Maximum Draw-down (chart 7) the R2 is 0.65 a better indicator of Maximum Draw-down risk.

### Conclusion

The Risk of Permanent Loss of Capital for fixed income investments can be tied directly to systematic Credit Agency borrower risk analysis and classification.

Because equity investors must rely on the market buyers to exit their investment, the exposure to Permanent Loss of Capital is directly related to the extent of the Maximum Draw-down of the equity portfolio and the Maximum Draw-down Duration from the beginning of the event until the value of the portfolio has recovered.

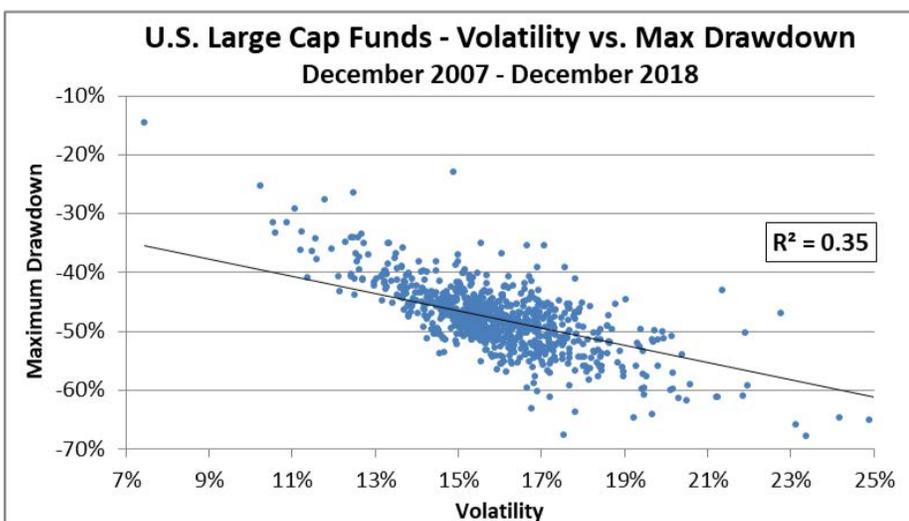
Historically Volatility has been used as the primary indicator of risk however it is a weak predictor of the real risk - Maximum Draw-down.

*Continued on page 10*

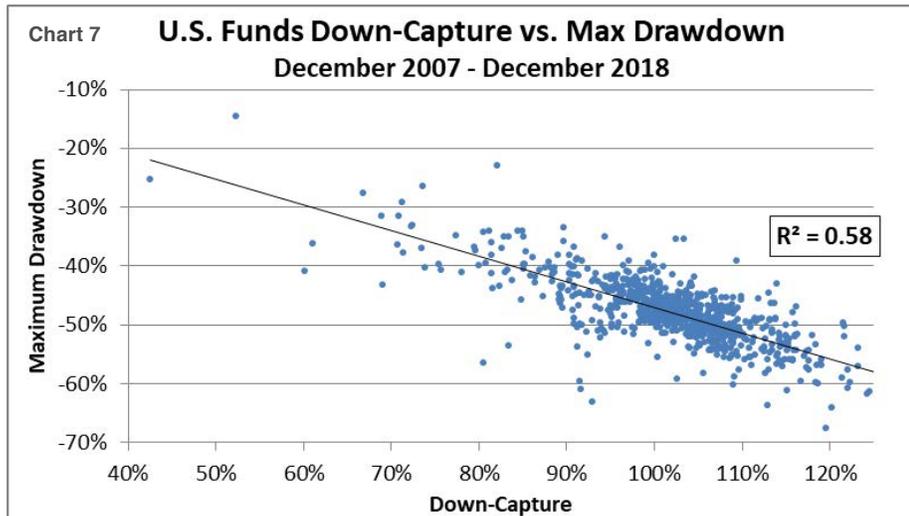
Four Quadrants:

- Upper Right - Aggressively Managed Strategies** quadrant: The Up-Capture is greater than 100% which means that the fund outperforms the S&P 500 as the index increases in value for instance in a Bull market. This feels good. However in market declines the funds will decline further than the market because Down-Capture ranges from 100% to 130%. Given the 51% market decline during the 2008-2009 financial collapse, the investor could be in for a wild ride. Note that in this quadrant a significant number of funds underperform the S&P 500TR (7.26% red constant return line).
- Lower Right - Poorly Managed Strategies** quadrant: The Up-Capture is less than 100% and the Down-Capture is greater than 100%. These funds will consistently underperform the market and present the investor with major declines in Bear markets, the worst of all possibilities.
- Upper Left - Optimum Managed Strategies** quadrant: The Up-Capture is greater than 100% and the down-capture is less than 100%. Investors feel good relative to the market in both Bull & Bear markets. As one can see there are few funds in this quadrant and the majority provides annualized excess returns less than 2%.
- Lower Left - Conservatively Managed Strategies** quadrant: Both Up-Capture and Down-Capture are less than 100%. In Bull markets these strategies underperform the market. However they outperform and add value in Bear markets, **providing better protection of investors' capital**. A low Down-Capture and a moderately low Up-Capture can outperform the market significantly. These strategies may not feel so good in a Bull market despite their **full market cycle outperformance**. As one can see there are numerous funds in this quadrant. Approximately 50% of the funds provide annualized excess returns of 0% to 6%.

Chart 6



## What is Risk?



When investing in equity strategies it is important to understand the performance of the portfolio over a full market cycle where Maximum Drawdown performance can be assessed vs. the benchmark. Down-Capture is a significantly better proxy for Maximum Drawdown Risk than volatility.

## Upcoming Events



1. CapVisor will be in attendance at the CICA Conference March 10-12 in Tucson at the Marriott Tucson Starr Pass Resort where we will be exhibiting and our booth is #23 so we hope that you have an opportunity to stop by to say hello to Carl or Paul or see Carl during his speaking session!

2. CapVisor is sponsoring and Carl Terzer will be in attendance at the SRS Symposium in Chicago at the Loews Hotel May 28-30th.

3. Carl Terzer will be speaking at

the IASA Conference in Phoenix at the Phoenix Convention Center Jun 2-5th. In addition CapVisor is exhibiting at booth #928. We hope that you have an opportunity to hear Carl speak or to stop by the CapVisor booth.

4. CapVisor will be in attendance at the Bermuda Captive Conference June 10-12 at the Bermuda Fairmont Southampton and we hope to see you there!



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