FRAME GLOBAL ASSET MANAGEMENT

White Paper 1 **January 2016**

We Embrace Non-Normality as the Key to Successful Portfolio Management Because This is How the World Actually Works

The definition of risk in the institutional investment management world is widely misunderstood. The commonly accepted definition is that risk is volatility, measured by the statistical calculation of the standard deviation of returns around an expected or desired return goal. Essentially, this means that risk is defined as uncertainty- the uncertainty of actually earning returns above or below this expected or desired return goal. While there is no question that there is a general aversion to what we do not know, it is quite flawed to say that returns earned above an expected or desired return goal should be avoided - the goal when discussing risk. This approach is rooted in what is referred to in the institutional investment management world as Modern Portfolio Theory.

The definition of risk has a very different meaning when you ask an individual what they regard as risk when it comes to their investment exposure. Most people answer “losing money”. They have no problem with unexpected high rates of return but they do not want to see their capital eroded. Several articles have addressed the flaws of looking at volatility as a risk measure rather than at volatility for what it is - uncertainty. We believe there is much to be gained by exposing these flaws, outright rejecting volatility as a measure of risk in institutional investment management today and then offering a more modern logical approach.

The pioneer of Modern Portfolio Theory, Harry Markowitz, revolutionized the field of finance in 1952 with his Journal of Finance paper “Portfolio Selection.” His work from the late 1950s and early 1960s changed the way people invested and left a permanent stamp on this aspect of portfolio management including what is being constrained, monitored and measured in portfolio asset allocation. The thinking goes like this: Asset classes experience a large distribution of returns over time, typically ranging from losses to returns far in excess of the average return, calculated over the measurement period. Markowitz defined both upside and downside deviation from a mean as risk, known as mean variance or volatility. He also assumed that losses always exactly equaled gains (the “normal curve”) but this is never true. Until the evolution of modern computing, investors were constrained in their ability to incorporate the true asymmetrical distribution of returns or “non-normality” into the asset allocation process. Not any longer! With the availability of sophisticated statistical tools and modern computing power, we do not need to settle for this simplifying assumption of fifty years ago and can meet the challenge of isolating the probability of suffering losses and in doing so, do a much better job of avoiding them.

Rejection of Volatility as a Measure of Risk — Recognizing the Non-Normality of Asset Class Returns

We observe non-normality in return distributions with longer and fatter left tails or negative returns with much greater frequency in the past decade than the decades that preceded it. Ignoring non-normality in equity and fixed income return distributions significantly understates losses that have been experienced and therefore misinforms us on the likelihood that these losses could be experienced in the future.

Macroeconomic environments contribute significantly to the non-normality of asset class return distributions. Recognizing that there are varying degrees of downside risk to asset classes under different economic environments, we can use a tactical asset allocation approach to deliver an optimal combination of broad asset class Exchange Traded Funds (ETFs) in a model portfolio.

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Deborah Frame, CFA, MBA
President and CIO

In This Issue:

Our Approach

Much has been written about the randomness of asset class behaviour over time, both in terms of returns and correlations to other asset classes. As studies on what drives the returns of asset classes have identified, the macro -economic environment factors into returns but the contribution is not static. The impact changes over time and is different among different asset classes. More significant is our observation that when historic data for asset classes is partitioned under broad economic environments, patterns of behaviour become obvious. This allows portfolios to be created with ETFs that are the closest proxy to the asset classes that are used in the modelling process. Using ETFs, we can specifically address expected returns among the asset classes being considered while also addressing the probability of negative returns in those asset classes in the anticipated economic environment.

Frame Global Asset Management considers the outlook for the global economy relative to a view of expected U.S. GDP growth in the twelve months ahead. The outlook falls into one of our five broad descriptions: GROWTH, STAGNATION, RECESSION, INFLATION and CHAOS, allowing for a transitioning in the period from one environment to another as well as recognizing total regime shifts. (See White Paper 2). The historical monthly return data of over forty asset classes is tagged using rules to assign each month with one of the five environments. From this tagging, expected return distributions are created by drawing from twenty years of return data using boot-strapping (random sampling with replacement) from past economic environments that are similar to what is anticipated in the coming twelve months. The twelve-month forward outlook and updating of expected return distributions is updated monthly.

Asset Class Examples

The exhibits below are created using bootstrapped returns from January 2000 to December 2015. The horizontal axis represents each single return drawn from random sampling, sorted from the highest return sampled on the extreme right side of the distribution to the lowest return sampled on the extreme left side of the graph. This sorting allows us to isolate the proportion of those draws that are negative, drawing a line at zero. The vertical axis represents the number of times each single return was drawn. The return drawn more frequently than any other appears at the peak of the expected return distribution curve and becomes the expected mean return. A good equity index example is the S&P 500 Large Cap Index. In Stagnation, the bootstrapped expected return distribution indicates a mean expected return of 15.4% with a probability of going negative of 15.9% (Exhibit A). In Growth, the mean expected return is 22.4% and the probability of going negative is 5.1% (Exhibit B). This exercise indicates that we can expect a higher return with a lower probability of experiencing a loss as we move from Stagnation to Growth. The SPDR S&P 500 ETF (SPY) can be used to get this exposure in an ETF portfolio.

Exhibit A

Data Source: Frame Global, Bloomberg

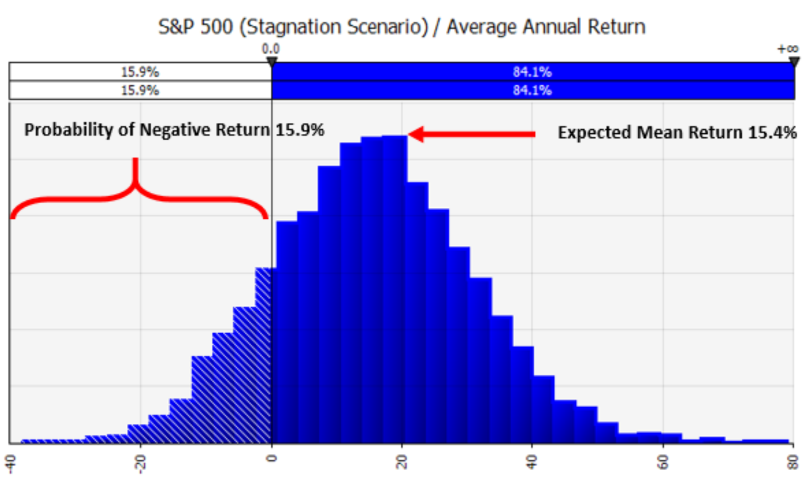
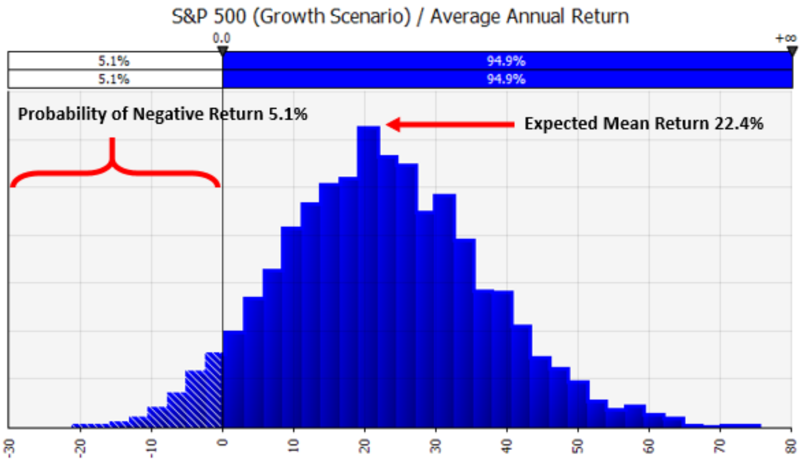


Exhibit B

Data Source: Frame Global, Bloomberg



Using the same historical data set, the iBoxx Investment Grade Corporate Bond Index shows a bootstrapped expected mean return in Stagnation of 8.6% and a probability of going negative of 4.0% (Exhibit C). In Growth, the expected mean falls to 4.0% and the probability of going negative increases to 27.4% (Exhibit D). The conclusion here is that we can expect a lower return and higher probability of experiencing a loss for the iBoxx Investment Grade Corporate Bond as we move from Stagnation to Growth. In this simple example the portfolio optimizer will prefer more of the S&P 500 Large Cap Index and less of the iBoxx Investment Grade Corporate Bond as we move from Stagnation to Growth. The iShares iBoxx Investment Grade Corporate ETF (LQD) can be used to get this exposure in an ETF portfolio.

Exhibit C

Data Source: Frame Global, Bloomberg

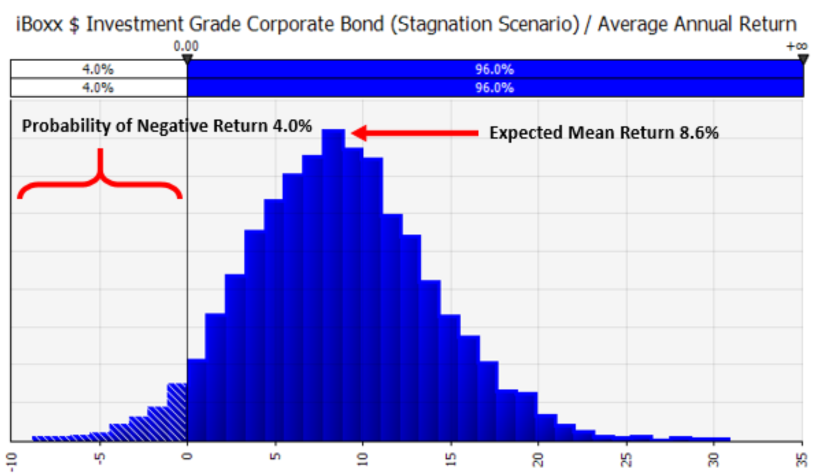
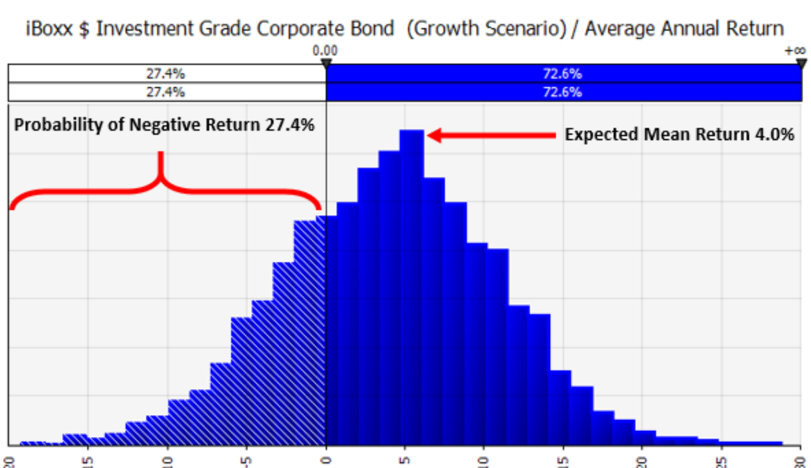


Exhibit D

Data Source: Frame Global, Bloomberg



The tables below highlight the distinction between expected behavior of other asset classes that we consider in our modeling as we move from stagnation to growth.

Index	Stagnation		Growth	
	Probability of Loss	Average Return	Probability of Loss	Average Return
1-3 Yr U.S. Treasuries	1.58%	2.55%	10.58%	1.60%
10-20 Yr U.S. Treasuries	19.38%	6.70%	37.96%	2.87%
20+ Yr U.S. Treasuries	25.66%	8.00%	49.44%	0.85%
3-7 Yr U.S. Treasuries	10.80%	4.63%	25.62%	2.79%
7-10 Yr U.S. Treasuries	16.24%	5.96%	35.74%	2.60%
MSCI Asia ex-Japan	16.66%	18.66%	1.62%	38.06%
MSCI Canada	28.02%	9.57%	8.64%	24.60%
MSCI Emerging Markets	19.46%	15.64%	2.52%	38.20%
MSCI Europe	23.38%	13.34%	6.62%	28.24%
MSCI Germany	26.64%	14.90%	6.06%	38.51%
MSCI Japan	20.24%	14.13%	15.92%	15.06%
MSCI Mexico	25.54%	15.17%	2.48%	37.60%
MSCI United Kingdom	32.64%	7.33%	5.24%	27.16%
S&P LargeCap 500	15.88%	15.42%	5.08%	22.43%
S&P MidCap 400	6.18%	23.27%	7.60%	23.99%
S&P SmallCap 600	5.82%	25.01%	10.22%	24.63%
U.S. High Yield Bonds	11.64%	10.05%	6.28%	10.08%
U.S. Investment Grade Bonds	4.02%	8.62%	27.36%	4.02%
U.S. Mortgage Backed Bonds	5.02%	3.38%	5.18%	3.96%
U.S. Municipal Bonds	12.52%	4.79%	16.78%	3.79%
Gold	35.26%	5.72%	21.18%	14.37%

All indices are total return with reinvested dividends for the period of January 2000 to December 2015.
Data Source: Frame Global, Bloomberg

We know that the past will never be exactly repeated in the future, and with exogenous stimulative monetary policy like Quantitative Easing (QE) promoting growth behaviour in equity asset classes, such as in the U.S. in the three years ending in 2014 and in Japan in 2015 while their underlying economies languished in stagnation, a certain amount of adaptability must be introduced when using return data from previous environments. In this paper our goal is to highlight the benefits of a tactical approach centered on the significance of the macroeconomic environment to downside risk management, using ETFs. In our second White Paper, we will expand on our dynamic approach to regime shifts such as Q.E.

This tactical approach combines the qualitative judgement required when considering the economic environment over the coming twelve months with the quantitative preciseness of bootstrapping and optimization. Using this approach, we have produced portfolios that have demonstrated that there can be success in any market or economic environment.

The idea of maintaining a locked-in 60 percent in equities and 40 percent in fixed income that grew from the Markowitz view of risk as volatility is outdated and should be shelved in favour of our more modern, logical approach.

Deborah Frame, CFA, MBA
President and Chief Investment Officer
Frame Global Asset Management

Other Information

Frame Global Asset Management Limited ("Frame Global") is an independent Portfolio Manager and Investment Advisor not affiliated with any parent company. Frame Global is registered with the Ontario Securities Commission and the Securities and Exchange Commission.

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We define Growth, Stagnation, Inflation, Recession and Chaos as the following:
Growth: U.S. Real GDP growth greater than 2.6%
Stagnation: U.S. Real GDP growth between 0 and 2.6%
Inflation: U.S. CPI greater than 2.7%
Recession: U.S. Real GDP less than 0%
Chaos: All asset classes exceed a correlation threshold

Volatility is a statistical measure of the dispersion of returns for a given security. Volatility can be measured by using the standard deviation or variance between returns from that same security. A higher volatility means that a security's value can potentially be spread out over a larger range of values.

Standard Deviation is a measure of the dispersion of a set of returns from its mean. The more spread apart the data, the higher the deviation. Standard deviation is calculated as the square root of variance. Standard deviation is also known as historical volatility and is used by investors as a gauge for the amount of expected volatility.

Past performance is not a guarantee of future performance.
Asset allocation is not a guarantee of performance.

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