

BWM

Investment
Guidance

**Wealth Distribution Specific Issues
Why Simulate and Focus on Withdrawals?**

Key Points:

- Simulated distributions : helpful but limited
- Focus on risk reduction and flexibility

Executive Summary

This BWM Letter is Part 2 of a review of Wealth Distribution ideas to help construct flexible life long retirement spending cash flow plans. Commonly used tools to estimate wealth distribution plans best suited to clients include portfolio allocation of different risk level assets, simulations, scenario analyses, and the adjustment process. Ultimately, the key is to educate clients about the limitations of planning, risks, and provide approaches to remain flexible and adjust for unexpected conditions.

Overview

The critical question for wealth managers “**What is the best allocation of financial wealth to meet client goals (retirement spending & gift bequeaths) over an expected life time horizon given one’s risk tolerance?**” is complex. The question is broken into parts and tools are used to address the issue – **Will I run out of money?** The asset allocation question was broadly answered for the ever rational investor by Modern Portfolio Theory (MPT) as developed by Harry Markowitz and William Sharpe in the 1960s. However, market historical asset returns, volatilities, and relationships change. Tools, like random future portfolio return simulations, are run to give an idea of how long assets will last before being spent. Simulation limitations will be reviewed. Valuations of market assets (P/E, yield, etc.) with average longer term (recent 5 yr. data) indicate relative higher or lower than normal current prices. The analysis combines asset economic performance with market price data. It indicates risks and future returns similar to your reasoning for purchasing a business asset. If the asset is on sale and you need it to perform a job productively, then you buy and use it! Asset valuations analyses suggest portfolio weights, while portfolio simulations suggest confidence levels for achieving goals.

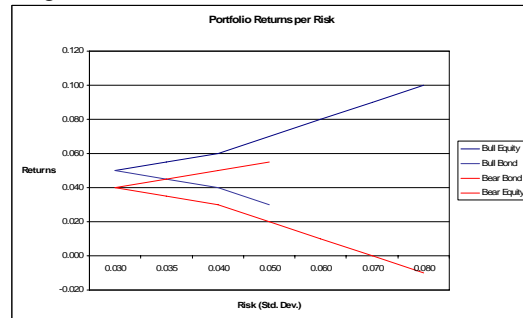
Risk reduction can be addressed by looking for an entity (insurer) that offers life time annuity

cash flow streams. Longevity risk (abnormal long life) can be transferred. The question becomes **How much annuity cash flow should be purchase and when?** It will be discussed. Finally, planning ahead with scenario analysis allows building flexibility into both retirement spending and gift plans. Low risk assets may be used to meet retirement spending goals and higher risk assets may be used for bequeaths at or near death. If the higher risk assets grow in value below plan, then beneficiaries will receive smaller gifts. Yet your spending needs are met. Risk tolerances change, as discussed in the general retirement withdrawal focused letter. Approaches for robust risk tolerant retirement spending are the final discussion topics.

Modern Portfolio Theory

MPT is based on asset historic return, volatility, and relationship (correlation) data. Broad stock (S&P 500, etc.) and bond data has been available for about 80 years (since 1926.) The data depicts the relationship between past asset returns and risk (volatilities expressed as normalized standard deviations relative to returns.) An investment portfolio is constructed with different equity and bond asset weights that sum to 100%. Figure 1 depicts curves in risk/return space as frontiers of expected returns per unit of portfolio risk. The allocation (% weights) (diversification) of equity and bond type assets benefit from the concept of asset non correlation. In other words, the bullish blue and bearish market red lines show allocations, including 30% equities and 70% bonds at the far left lowest risk point, 100% equities at the highest risk long blue and red line ends, and 100% bonds at the short blue and red line ends. As portfolio asset correlations decrease the curves shift left to lower overall risks and as the correlations increase the frontier curves shift right to greater overall risks.

Figure 1. Portfolio Efficient Frontier



Efficient frontier generally refers to the upward sloping blue line, where a portfolio experiences the expected returns for efficient risk taking. All MPT based analysis focuses on normally bullish market conditions. Higher portfolio equity weights (with higher risks) are allocated in quest of higher returns.

There are uncertainties in the simple ideal MPT. Markets do not always provide higher portfolio returns for increased equity risk taking. Bear markets are interspersed between bull market periods. During bear markets asset prices decline and the normal blue line flips to the red line (recent 2000 to 2002 period.) Total returns of portfolios that are heavily weighted in equities during bear markets show losses (much greater than the -1% loss at full equity allocation depicted at the Figure 1 lower red line end.) Next, be aware that during emotional market declines (e.g. Oct. 1987, Aug. 2007, etc.) the portfolio correlation increases dramatically and the curve shifts dramatically right and down. Most portfolio equity and bond allocations will show losses during bear markets. Large cash allocations are the simplest way to limit bear market risk and loss. Finally, remember the 80 year data set is too limited to cover all likely scenarios. MPT is based on a linear normal data distribution similar to the 80 yr. data set. The recent 100 years of German equities and bonds data, if available, would show higher risks and lower long term returns than U.S. market data. Totalitarian regimes, wars, and depressions (worse than the U.S. 1930's depression) are sobering scenarios showing U.S. free market MPT returns are not guaranteed and generally were better than should be expected.

Retirement Investment Withdrawal Rates

The Part 1 general withdrawal rates discussion stated that retirement portfolio initial withdrawal rates between 4% and 6% are often suggested based on spending time horizons and portfolio risk levels. Longer time horizon (30 yr.) retirement spending may be near a 4% initial withdrawal rate, include a 50% stock and 50% bond or alternative asset allocation, and be backed by random simulations which estimate a 90% confidence level of not running out of money. Prior to examining the ins and outs of simulations, you may ask: **Is there a more intuitive tool for dealing with the uncertainties of longevity, changed spending demands, inflation, and investment returns?** Yes, there are flexible approaches to meeting

spending needs, if risk taking is reduced (fixed annuities) and spending is temporarily reduced (flexibility) during unusual low investment return periods. Before showing those ideas, we will discuss why something that sound like gambling (Monte Carlo simulations) is used in wealth distribution planning.

Monte Carlo Simulations

Let's spin the wheel of fortune! As usual, ideas are not what they may initially sound like. Monte Carlo simulations have been used by wealth managers for a few decades, based on the observation that past long term nominal equity (10%) and government bond (6%) returns can be used for future long term expectations. However, just like at the blackjack table, the retirement spending sources may draw down after an abnormal number of initial investment losses and result in running out chips prematurely (before death.) The simulation takes past investment asset return and volatility inputs; as well as one's asset allocation weights, withdrawal rates, and inflation adjustments; and plots a number (100, 1,000, or etc.) of random simulations of the investment accounts over a time horizon (10, 20, or 30 yrs.). The ratio of acceptable (above 0 end value) simulations over the total number of simulations determines the confidence level. For example, 750 acceptable / 1,000 total simulations give a 75% confidence level that a client will not run out of money. Figure 2 is a simple example.

Figure 2. Simulated Retirement Wealth Changes

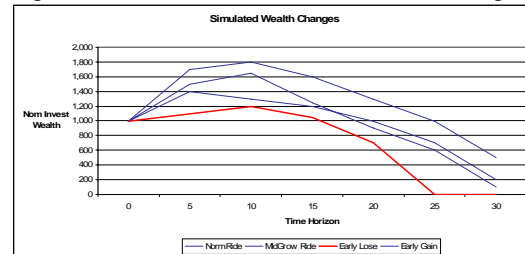


Figure 2 depicts 4 scenarios of retirement wealth changes; long term normal returns, mid growth returns, early period losses, and early period gains. Notice that 3 of 4 scenarios resulted in (above 0) assets in the account at expected death (30 yrs.), but one scenario (red) ran out of money after 25 yrs. That is a 75% confidence level that your 1000 initial chips will not run out while you are alive. Just like the blackjack table, when you run out money, it doesn't matter what opportunities come up for others still in the game.

The Monte Carlo simulation is a good tool. Yet there are key considerations. Risk adverse people may want 95% confidence that they will not prematurely run out of financial wealth. In order to gain that confidence level, either the withdrawal rate must be reduced, the asset allocation adjusted to a lower risk, or a more flexible approach found. On the other hand, some people are happy with a 75% confidence level based on the simulations. Their reasoning may be that life is to be enjoyed. If they run out of money at an old age, then there will be some family or social safety net to care for them. Nonetheless, they don't want to be overly cautious and leave some money on the table when the man upstairs calls them to rest.

Monte Carlo simulation shortcomings are based on implementation techniques, the nature of markets, and poor client explanations. The assumptions and their implementation are complex. Different simulation models give very different results. It is not unusual for the same inputs to get a 75% confidence level of achieving the goal from one simulator and 88% confidence level from another. The simulators are basically linear normal distribution random number generators based on limited data points. An Oct. 19, 1987 extremely rare market fall event will probably not show up in any simulation. Other unlikely events (unexpected unknowns) such as wars, force majeure, or so-called acts of god discontinuities, are outlier or fat tail distribution events that are not included in the simulation data. Random scenario simulators do not show serial correlation of returns. By nature random events are always random. However, markets move from over valued bubbles to under valued cleansing periods and future cycles based on the greed and fear of human nature. The cycles are not on one year increments. On the other hand, they don't follow exact presidential election cycles either. Alan Greenspan and others were good observers, when they talked about irrational exuberance in Dec. 1996. They simply didn't know how much more exuberant the bubble markets would get! The Fig. 2 red scenario is based on poor market returns during the high inflation 1970's. Neither stock nor bond real returns could keep up with inflation, so that the 30 yr time horizon person simply ran out of money before the late 1990's party got into high gear. These simulation shortcomings are not explained by many financial planners to their clients because the advisers have a small box of tools and don't know their limitations.

Risk Reduction Asset Allocations: Annuities?

Individuals or couples can transfer investment risk to an insurer. That is purchase annuities with retirement portfolio assets. Annuity or longevity risk reduction insurance is unique. The purchaser collects extra cash flows based on the good event of living longer than the insurer's mortality table expects. That is different from life insurance to compensate for death or fire insurance to compensate for a home loss. The insurer makes the bet because he spreads his risk among others, who live less than expected. The annuity purchaser simply transfers portfolio self insurance spending risk to the insurer. Yes, there is a catch. The contract is generally irrevocable. The insurer wins the remaining cash flows, instead of your heirs, if you die prior to mortality expectations. A reasonable minimum amount of annuity purchases can be calculated. The 3 parameters needed for the estimate are: market sustainable retirement portfolio withdrawal rate, required spending withdrawal rate, and insurer's offered annuity rate. The sustainable withdrawal rate (SWR) (e.g. 3%?) is based on simulations and high confidence (95%) that a normal allocation portfolio will not run out of spending cash flows during the time horizon. The required withdrawal rate (RWR) (e.g. 4%?) is the spending rate that the client needs. The annuity rate (AR) (e.g. 6%?) is the best acceptable fixed annuity inflation adjusted rate available. The boundary conditions are: no annuities are needed if $SWR > RWR$ and no real annuity value exists if $RWR > AR$ because the annuity rate is not high enough to achieve your required spending goal. Otherwise, a Minimum Annuity (MA) % amount can be calculated as:

$$MA = (RWR - SWR) / (AR - SWR)$$

Or using the example rates $MA = .01 / .03 = 33\%$ calculated annuity percent of retirement spending portfolio assets. The irrevocable annuity contract may still be a concern for some. Incremental annuities can also be purchased similar to laddered maturities CD's. For example, at age 65 16% of needed cash flows can be funded by an annuity purchase and at age 70, if you still like the idea, then another annuity worth 17% of needed cash flows can be purchased. With all things considered an age 65 to 75 is a suggested range for purchasing fixed immediate annuities to secure cash flows by transferring risk.

Market Secular (Long Term) Valuations

Non random market cycles were mentioned in the context of over valued (bubble) and under valued markets. Estimating whether we are in a

secular (longer term) bull market or a secular bear market is complex. Equity longer term price earnings (P/E ratios or their reciprocal equity yields) and bond yields indicate market valuations. Three, five, and ten year trailing average P/E ratios are used by some for the valuation estimates. My preference is the trailing 5 yr. P/E ratio. The long term average P/E for the S&P 500 index is about 15 in a long term 3¼% inflation environment. When the market long term P/E exceeds 18, markets are richly valued and when the long term P/E is below 12 then equity markets are very prudently priced. Naturally special uncertainties, such as wars, price controls, and inflation coincide with low priced markets. Stagflation, high inflation and below normal real GDP growth, is a major investor uncertainty. Both stocks and bonds are impacted by stagflation. The quality of earnings is not robust and inflation pushes related yields up (bond prices down.) The comforting news for retirement portfolios is that relatively simple allocation adjustments can deal with over valued or under valued markets. Many simulations have been done on retirement spending portfolios. They generally show that a 50% stock fund / 50% bond fund allocation at a 4% spending rate over a 30 yr. time horizon has a high confidence level (90%) of not running out of cash flows. Interestingly there is little confidence level difference between a 65%/35% allocation mix and a 35%/65% allocation mix, in markets with changing efficient frontiers. Yet if stock or bond markets are clearly over valued, it is usually better to reduce that market weight and allocate a higher % to cash or short duration (<5 yrs.) fixed income assets. My perspective is that a stagflation scenario (>4% inflation, <1.5% GDP growth) exists and that the long term S&P 500 P/E near 20 shows current over valued markets. Retirement portfolios should be biased toward capital preservation, until economic conditions or market valuations improve. In other words, a secular sideways market exists and so called 9 to 18 month bear market downturns are more likely now than in a secular bull (1982 to 1999) market.

Flexibility

A few approaches to achieving wealth distribution goals have been discussed (buy annuities or reduce over valued retirement portfolio asset weights to reduce spending cash flow risk.) Now I shift the focus to the actual spending. There are general goal spending priorities and specific goal component priorities. The general goals may be complex; retirement

spending and bequeaths to family and others. The goals should be prioritized and generally be funded with different resource pools. Retirement spending usually has a shorter immediate time horizon than bequeaths at death. Therefore, spending cash flow risk level should be lower; i.e. a high confidence level of not running out of cash flows. The longer time horizon bequeath goal at death can generally be funded by higher risk assets. For many people a particular value gift is less important than the immediate priority of sufficient retirement spending cash flows. Retirement spending can also be separated into components. A high priority potential long term care component may be paid for with an insurance policy. The lower priority planned next year vacations may be paid for by normal portfolio performance. For instance, if expected portfolio performance is 6%, then abnormal performance may be above 12% and below 0% with a 40% sharing factor. If actual performance is 15%, then 40% of the net abnormal returns may be used for a second vacation. But if actual performance is -3%, then 40% of the net shortfall would reduce the scope of the vacation to a local resort instead of a foreign villa. (Only the highly disciplined couple would agree to the flexible vacation idea.) Pools of component spending resources are other creative ideas between advisers and clients to be flexible and plan ahead to stretch the spending resources and deal with life's uncertainties.

Summary

- Use simulations to get a general confidence level for meeting goals
- Consider asset valuations and risk transfer techniques to improve probabilities of meeting wealth distribution goals
- Flexibility is always an asset in life

References:

Banach, Joseph *BMW Letter* Aug. 8, 2008
 Evensky & Katz, *Retirement Income Redesigned* 2006

LEGAL DISCLAIMER – Information concerning BWM Letters

The BWM letter is not in any sense a solicitation or offer of the purchase or sale of securities. The factual statements herein have been taken from sources we believe to be reliable but such statements are made without any representation as to accuracy or otherwise. Opinions expressed are our own unless otherwise stated.

If we buy, hold, or sell securities discussed herein, we will disclose our positions. Prices shown are approximate. Joseph Banach. Banach Wealth Management.