Managing Portfolio Risk

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What is Investment Risk? - Investopedia

- Risk often refers to the probability that an Outcome occurs or an investment's actual gains will meet target levels
  - Risk includes the possibility of losing some or all of an original investment
- Quantifiably, risk is usually assessed by considering historical behaviors & outcomes
- Risk is not the same as Uncertainty
  - Risk can be defined & measured; Uncertainty cannot
- Risk in investments is generally represented as standard deviation around the mean of a normal curve
  - This is a very narrow definition

Using Risk Measures to improve attainment of Financial Goals

- Broadly there are three types of Outcomes:
  - Long-term Return
    - Example: Grow $20,000 to $ 60,000 in ten years to help fund grandchildren's college
  - Sustainable withdrawals over a long-term
    - Example: Provide an inflation-adjusted $40,000/yr for 25 years.
  - Short-Term Trading
    - Example: Trend-following strategies
- Risk metrics can help quantify the possibility of falling short of desired Outcomes

Broad List of Risk Metrics

- **Volatility**
  - Mean
  - Standard deviation
  - Sharpe ratio
  - Treynor & Sortino ratio
  - Information ratio
- **Portfolio Stats**
  - Alpha
  - Beta
  - R-squared
  - Up & Down Capture ratios
- **Morningstar ratings – Risk vs Reward**
- **Account drawdowns in crisis times**

Alpha & Beta

- Beta measures the level of performance of a stock or bond or fund relative to the market
  - Those trading below 1, are less volatile than those trading above a ratio of 1.0
  - An S&P Index fund has a ratio of exactly 1.00 by definition
- Alpha measures the level of performance of a stock or fund relative to other stocks/funds in it's benchmark group
  - If positive ratio, Manager has added performance & vice versa

Std Deviation - A narrow definition

- $ Industry uses volatility as a proxy for risk
  - *So much more to consider!*
  - Hence use of other risk metrics outlined herein
- SD reflects the extent to which a fund's returns vary over time around its mean
  - Hi-Vol will experience more dramatic gains & losses
- Doesn't tell you anything specifically about a fund's volatility to the downside
  - Far more important in avoiding losses
- Past performance is not necessarily indicative of how the security will perform

Up/Down Capture Ratios

- Calculates extent to which a fund's performance mirrors that of its benchmark
  - Examples are the S&P 500, MSCI All Country World ex-US Index, & Barclays U.S. Agg Bond Index
- A ratio of 100% means the fund & its benchmark share the same degree of change
- Higher ratio is better for Upcapture & a lower ratio is better for Downcapture
  - Ideal would be well >100% on Upside & well <100% on the Downside
- Also, the designated benchmark may not be a great fit for the fund

Sharpe Efficiency Ratio

- Measures a security's performance relative to the units of "risk" it undertakes
- The calculation is made by dividing the risk-free ROR (actual less risk free return) by its' standard deviation
- Higher ratios are better
- A fund with a higher Sharpe ratio is said to be more efficient in terms of delivering performance relative to level of risk
- Doesn't work well when a fund has negative performance

Treynor Efficiency Ratio

- Ratio calculated by dividing excess returns above the risk-free rate by the downside market volatility
- Similar to Sharpe ratio, but with more emphasis on downside performance
- A fund with a Treynor ratio that is higher than a competing fund has delivered better returns
  - Relative to its downside volatility
- As with Sharpe ratio, doesn't tell the whole story - best used in conjunction with other risk metrics
- Also similar to Sortino ratio
  - Divides by Beta - up/down volatility

Information Ratio

- Best way to evaluate risk adjusted performance
  - According to many experts
- Like Sharpe ratio, it measures XS returns per unit of risk
- Difference from Sharpe is that this ratio measures XS returns per unit vs its' benchmark
- Reflects efficiency & consistency of portfolio mgt
- Most skilled managers have high Information ratios
  - But they represent a minority of PMs
- A negative ratio speaks to underperformance vs peers

Morningstar Ratings

- These provide a Return vs Risk ratio expressed like 5vs1
  - This would be the highest rated fund with the minimum of risk - quite rare!
  - So an ETF with 4vs2 or 5vs3 risk/reward would be a good balanced fund
    - A 2vs4 ratio not so much!
- The measures compare how a fund performs relative to its' sector peers - emphasis on downside volatility
- Major brokerages widely quote the MS ratings in describing fund performance

Shortcomings of Risk Metrics

- Market risk only considers volatility
- In a crisis, all correlations can revert to1
  - Or close thereto!
- Therefore, can only use Volatility metrics assuming you are in a normal market
- Hence the need to also consider the historical level of market drawdowns
  - One more key item to include in your investment selection process!

Ideal # of Asset Classes*

- Large Cap US equities
- Mid Cap US equities
- Small Cap US equities
- Foreign stocks from Developed markets
- Foreign stocks from Emerging markets
- Real estate
- Natural resources
- Government bonds – long, short & intermediate, US & foreign
- Corporate bonds - long, short & intermediate, US & foreign
- TIPs (inflation adjusted bonds)
- Cash &/or money markets

Most can also be sourced from Alternative Investments to add the return premium & further diversify risk

Diversified Portfolio Example

- 7Twelve Portfolio
  - Covers all Asset Classes
  - Multi-year return is equity-like
  - Multi-year standard deviation is reduced en toto
  - Possibility of failing to achieve goals are reduced

Multi-Asset Portfolio

Fewer and smaller losses

1970-2017	Large US Equity	Small US Equity	Non-US Equity	US Bonds	Cash	Real Estate	Commodities	Equally Weighted 7-Asset Portfolio
48-Year Average Annualized % Return	10.54	11.10	8.94	7.53	4.86	11.76	6.99	9.84
48-Year Standard Deviation of Annual Returns	17.00	21.35	21.68	6.52	3.54	18.61	24.95	10.05
Number of Years with Negative Returns	9	14	14	3	0	8	14	6
Worst Three-Year Cumulative % Return	(37.61)	(42.24)	(43.32)	4.39	0.14	(35.61)	(55.60)	(13.37)

Allocation - Diversification & Screening

- Allocating $ to all the asset classes ensures that you will always exposed to best performing sectors
- Include lower-risk assets that buoy a portfolio or act as stabilizers against volatility e.g. 60/40 classic portfolio
- Include higher-risk assets that provide the fuel to secure higher returns
- Include private investments (Alternatives) to capture better returns & lower portfolio exposure to market risk
- Invest in Funds & ETFs versus individual stocks to reduce risk
- Do not leverage your portfolio with margin funds
- Assess overall Portfolio Mix, especially how it's components work with each other

A Risk Drill for Retirement Portfolios

- Does your portfolio have too much market exposure?
- Does it have too much or too little liquidity for your needs?
  - This implies you have a Financial Plan that doesn't require major updates before you can use it
- Does it have sufficient growth potential?
- Is it courting too much risk or too little risk?
- Does your portfolio have a well-defined coherent drawdown strategy? Is it flexible with down-markets?
- Is there adequate inflation protection?
- Is the portfolio insulated from spending shocks?
- Have you designated a successor to replace yourself?

Risk types that Cry Out for Protection
- via formal Contracts

- Playing the stock market
- Buying insurance/hedge policies
- Litigation cost/benefit decisions
- Correlations that revert to 100% in a crisis
- When taking a Contrarian position to Wall Street
- When Hedge Fund strategies no longer work
- Exogenous events like a pandemic (Black Swans)

Market Risk Management

Market Corrections

- Effect
  - Market declines of 10 - 20%
  - Duration of weeks to several months
  - Impacts mainly equities
- Little impact in long term
- Risk that trend-following strategies, carefully tuned using back-tests, may fail in unforeseen market conditions
- May present buying opportunities

Bear Markets

- Effect
  - Market declines > 20%
  - Duration of months to several years
  - Impacts many asset classes
- Asset withdrawal exposes risk of missing biggest up-days in recovery
- Mitigations
  - Non-Market diversification
  - Income not tied to markets – e.g. social security, pensions, annuities
  - Sufficient cash to avoid withdrawal from invested assets
  - Trade into assets with lower valuations & greatest chance of bounce-back

Where to buy Downside Protection

- Annuities from major Insurance companies
  - Historically: Illiquid, high-commission, inflexible
  - Coming around to fulfilling User needs
  - First Buffered annuities are now rolling out
- Buffered ETFs
  - Reasonably new, typically monthly liquidity
  - Recent AAII paper by Mike Muhle
- Options trading
  - Well established, highly liquid market
  - Thrives in higher volatility & rapid value decay

Where Downside Protection cannot be bought

- All the other myriads of places where it is not feasible to obtain a contract
  - There is no counterparty to take on risk at a reasonable price
- Also contracts cost $$
  - Either in premiums &/or opportunity cost
  - Contracts themselves must be fully vetted & tested for downside risks

Buffered Risk Protection - Example 1

- Top tier Insurance company *offers 15% downside protection* per year for 6 years
- *Subject to a cumulative cap of 180%*
- Simplified Best Case example 6 years:
  - *5 years @ 24.1% on $100k compounds to $294k*
  - *Year 6 loses (20%); reduces value 5% to $280k*
  - Full offering: -10%/300%; -15%/180%; -20%/80%
- Product can be repeatedly rolled over
  - Subject to a 25 bps expense annually

Buffered Risk Protection - Example 2

- Another top tier Insurance company *offers 10% downside protection* year by year
- *Subject to a cap of 17.5% per year*
- Simplified Best Case example 6 years:
  - *5 years on $100k @ max 17.5% compounds to $224k*
  - *Year 6 loses (20%) & reduces value by 10% to $201k*
- Choice of different indices
- Product can be repeatedly rolled over
  - Zero expense annually

Risk Management - Takeaways

- Use a highly-diversified asset mix with minimal debt, reliable income, steady returns & some upside performance within reasonable risk limits
- Focus on the downside; upside will take care of itself
- Diversify by asset class - more the better
  - Use Alternatives to trade off higher returns for unused liquidity
  - Use different investing strategies e.g. income & factor based
  - Lock in private notes vs Treasuries to beat your withdrawal rate
- Prescreen investments with risk metrics to better understand the Risk/Reward trade off
- Buy "insurance" to protect LT performance from downsides for the majority of equity market exposure
- Minimum goal should be to have your $$ outlive you!

AAII Houston Chapter

Additional Questions?