Three-Dimensional Investment and Analytics Solutions in a Two-Dimensional Marketplace

Between Investment Portfolio Analysis and Investment Asset Allocations, there are tools to better equip investors to attain a sustainable and respectable risk-adjusted return than what were widely available twenty years ago. In other words, over the last twenty years, additional dimensions have become available to achieve superior investment performance. Yet the vast majority of investors are unaware of these beneficial solutions for a number of reasons we will explore.

The concept of Three-Dimensional Solutions pertains to two perspectives. One perspective is the three dimensions of asset allocation: stocks, bonds, and alternatives. By moving from one dimension to two, from stocks-only to stocks and bonds, an investor could retain 80% of their return and reduce their downside risk by over 50%. In financial parlance, their portfolios could become much more efficient as they earn more return for each unit of risk taken. By introducing a third dimension to asset allocation, alternative investments, the phenomenon is exaggerated further. By creating a three-dimensional investment portfolio as opposed to one, an investor can retain 85% of their return and reduce risk by 67%.

Instead of asking "Why would a person adopt a three dimensional approach?" the better question is *"Why wouldn't they?"* Why would you only observe one dimension or two, when you could observe three?

The Case Against Using Alternative Investments as a Third Dimension to Asset Allocation

Incorporating a robust offering of alternative assets remains limited to a narrow subsect of the investment management industry. Alternative investments are an excellent supplement to stocks and bonds, yet very few investment advisors discuss these benefits to clients for a variety of reasons:

- *There is a burden on the investment advisor to conduct due diligence on the alternative investment fund manager to develop a thorough understanding of their fund strategy. Fund performance rests at least as much on the expertise of the fund manager as it does on a specific sector's market conditions.*
- *There is no simple and singular explanation that covers the world of alternative investments. What is difficult to explain tends to be difficult to sell.*
- *Alternative investments can be more burdensome to administer for an investment advisor; they are typically not as operationally efficient as most bond and equity funds.*

- *Because of the first three reasons, and because alternative investments have only been broadly offered over the last ten to twenty years, the status quo conventional investment portfolio has little to no allocation to alternative investments.*

In summary, the primary reason an investment advisor wouldn't offer alternative investments is it might hinder their ability to operate as a well-oiled sales machine; it has little to do with whether adding alternative investments as a third dimension of portfolio return is a positive contribution to serving clients.

For more about alternative investments, please refer to our alternative investments white paper.

Beyond having three dimensions to investment portfolio management, there is another perspective of a three-dimensional view of risk and return.

Three-Dimensional Investment Portfolio Analysis

First Dimension: Return

The mostly commonly used dimension of investment analysis is one everyone is familiar with: return on investment. This answers the question: "How much did I receive in compensation for the risk I took?" While determining return is usually straightforward, determining the quotient for risk is more ambiguous.
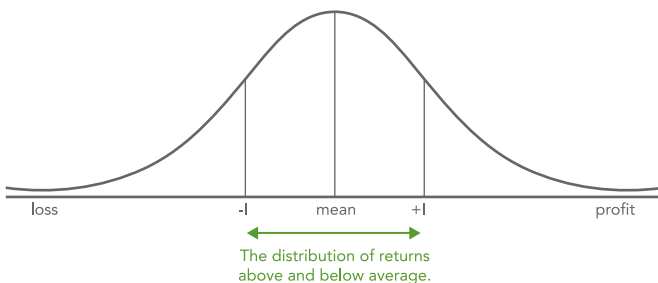
Second Dimension: Standard Deviation

The second dimension of portfolio analysis is the quotient for risk most frequently used by the mutual fund industry: standard deviation. While numerous investment houses use standard deviation in their marketing materials, few investors and advisors actually know its definition. Standard deviation measures an investment's dispersion of returns from its average return. In other words, it's a measure of how widely scattered returns tend to be from the average return.

- If an investment has an average return of 6% and a standard deviation of 7%, it means about 68% of annual investment returns will be between -1% and 13% return.

- One standard deviation covers 68% of outcomes and two standard deviations covers 95% of outcomes.

- Taking a wider view, a person could say, "According to the mathematics, 95% of the time, the return should be between -8% and 20%."

Standard Deviation

Bell Curve

The distribution of returns above and below average.

While standard deviation is a good general approximation of how widely returns can range from average, it is dangerous to use it to make probabilistic assessments. If used to answer the question "How much money might I lose if things go bad?" it will consistently understate risk by a large degree, to the detriment of investors. In conclusion, standard deviation answers the question "How much will my portfolio rise above or fall below the average return throughout normal market activity?" Yet, this is the primarily quotient the investment industry has been using for risk since the before the 1960's.

Despite the broad availability of standard deviation metrics across virtually all publicly available mutual funds, few investment advisors go to the length of discussing this with clients, and fewer provide clients an indication of the standard deviation of their investment portfolio.

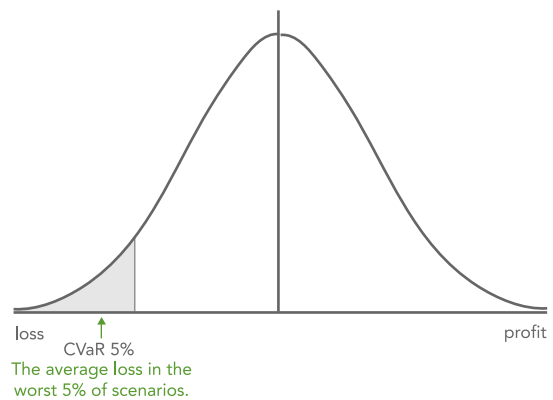## Third Dimension: Downside Risk (Conditional Value at Risk)

The third dimension of portfolio analysis is very seldom used in the retail investment community, yet is commonly used by hedge funds and institutional investors; it is Conditional Value at Risk (CVaR).

According to Investopedia.com:

"Conditional value at risk (CVaR) is a risk assessment technique often used to reduce the probability that a portfolio will incur large losses."

CVaR specifically indicates the average losses to be expected in the most negative scenarios, typically the worst 5% of all scenarios. CVaR is determined using a model that observes an investment's historical performance characteristics, then simulates thousands of one-year forecasts, and calculates the average loss in the worst five percent of all scenarios. If a model simulates 2,000 one-year return forecasts, it would average the lowest 100 scenarios as the indication of downside risk for the investment.

Conditional Value at Risk (CVaR)

CVaR 5%
The average loss in the worst 5% of scenarios.

Using this type of simulator, it is also provoking to observe the maximum loss scenario. This provides investors a much more sober appraisal of an investment's risk profile. As an example, a fund run through our simulator suggested an average return of 12%, standard deviation of 26%, CVaR of 41%, and maximum loss of 98%.

The challenge of using CVaR is the requirement of needing a model to simulate performance. The technical requirements to suitably model these scenarios is probably out of reach for most do-it-yourself investors and even most investment professionals. The burden to conduct the analysis is more contingent upon expertise than it is financial resources.

In conclusion, CVaR answers the question, "How much might I lose if things go bad?" The CVaR description opened by saying it is perhaps the most important measure, yet the most seldom used. By being aware of downside risk prior to a market drawdown, an investor is more able to avoid regretful outcomes, which might ultimately lead to subsequent suboptimal investment decisions, which lead to further regretful outcomes. By operating with downside risk at front of mind, an investor is less likely to make decisions out of greed or fear than if they are using return or standard deviation as their primary decision tools.

Three Dimensional Investment Portfolio Analysis Solutions

If an investor is equipped to know the expected return, standard deviation, and downside risk of an investment or portfolio of investments, they have the ability to make much more intelligent investment decisions. Instead of asking "Why would a person adopt a three dimensional approach?" the better question is "Why wouldn't they?" Why would you only observe one dimension or two, when you could observe three?

The approach of using these three diagnostics in conjunction with each other should be a standard practice throughout the investment industry. Yet, downside risk modeling remains limited to a select handful of investment analytics firms, few of which actually bear the accountability of managing investment portfolios. In comparison to return, the consideration heeded to investment risk is unjustifiably small.

This is where First National Bank is a differentiator. First National Bank is in the small minority of firms who:

1. Offers accurate risk and return diagnostics across a wide range of investments

2. Offers investment portfolio solutions that are optimized based upon these diagnostics across stocks, bonds, and alternative investments

3. Operates in a fiduciary capacity where it is motivated by moral principles and legal obligation to always put clients' best interest ahead of the interests of the company.

If you are wanting to take the next steps in attaining a more comprehensive understanding of risk and return on your investments, reach out to First National Bank to receive a complimentary assessment on your investment holdings. First National Bank is passionate about taking investment solutions used by institutional investors and market insiders and providing them to individual households with the mission of Igniting Family Prosperity.

About First National Bank We want to be your partner in creating a plan that secures and empowers your financial prosperity, while giving you the ability to care for your family today and for generations to come. Contact First National Bank today by calling **(217) 935-2148**.

See Man vs Machine article to understand how Return, Standard Deviation, and Conditional Value at Risk can link via algorithms to identify great risk/reward portfolios.

Appendix A

Misleading Application of Standard Deviation

With naturally occurring phenomenon such as sizes of trees and people, the weight of animals, the speed of sprinters, or even the weather, standard deviation can be fairly reliable. With a large enough sample size, all of these things will consistently abide by the percentages suggested with standard deviation. For example, standard deviation will accurately indicate the probability of a person being over eight feet tall.

Since investment returns are not distributed like natural occurring phenomenon, standard deviation can only be relied upon as a good rule of thumb, not as an exact science. In fact, the differences in how heights are distributed and how returns are distributed are big enough to create big misunderstandings when it comes to estimating the probability and severity of downside risk. In the example above, stating that "68 percent of annual investment returns will be between -1 percent and 13 percent " may be in the right ballpark, but would not be precisely accurate.

"On August 4 [1998], the Dow Jones Industrial Average fell 3.5 percent. Three weeks later… stocks fell again, by 4.4 percent. And then again, on August 31, by 6.8 percent ... In fact, by the conventional wisdom, August 1998 simply should never have happened; it was, according to the standard models of the financial industry [standard deviation], so improbable a sequence of events as to have been impossible. The odds of getting three such declines in the same month were: about one in 500 billion… The seemingly improbable happens all the time in the financial markets. A year earlier, the Dow had fallen 7.7 percent in one day. (Probability: one in 50 billion.)"

Benoit Mandelbrot "The (Mis)behavior of Markets"