

## **Risk and Return**

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Most of us, as investors, can be classified as risk-averse. In the purest sense of risk, we do not like to lose money. Thus risk to many of us is a down market. We also do not want to incur risk without at least some expectation for increased return. One of the many challenges we face as investors is determining if we are being compensated for taking risk. That is, are we earning a return sufficiently high enough to make us comfortable with the level of risk we are assuming?

### **Quantifying Risk**

One measure of investment risk is the variability (standard deviation) of investment returns. The higher the standard deviation of returns, the higher the risk. Conversely, the lower the standard deviation, the lower the risk. Let's look at an example. Suppose Manager A produced the following returns: Year 1 = 40%, Year 2 = 12%, Year 3 = 9%, Year 4 = 16%, and Year 5 = 10%. Suppose Manager B produce these returns: Year 1 = 35%, Year 2 = 15%, Year 3 = 12%, Year 4 = 11%, and Year 5 = 13%. Both of these managers have shown average annualized returns of 16.87% over the last five years. Which manager would you choose? Our first impulse may be to say that it doesn't matter. However, when we introduce the concept of risk to our problem it begins to matter a great deal. The standard deviation of annual returns for Manager A is 11.5% while Manager B's standard deviation is only 9%. Thus if all other criteria for each manager is similar, we should prefer Manager B over Manager A because risk is less and the return is the same.

### **Risk Adjusted Returns**

Things are not always that simple in the real world. Many times we find it necessary to compare unequal returns with unequal standard deviations and our decision becomes much less clear. Lower standard deviations do not always mean that we are receiving an acceptable risk/return tradeoff. Suppose Manager C has shown a five year annualized return of 15% with a standard deviation of 11%. The comparable index has shown a five year annualized return of 12% with a standard deviation of 9%. Thus, Manager C has beaten the index but he has also incurred significantly more risk. Is this acceptable and how do we know for sure? Are we being adequately compensated for increased levels of risk? One popular measure that investment managers and consultants use to quantify risk is the Sharpe Ratio. The Sharpe Ratio is defined as portfolio performance minus the risk free rate of interest, divided by portfolio standard deviation, or  $SR = (Perf - RFR) / SD$ , where SR = the Sharpe Ratio, Perf = Performance, RFR = the Risk Free Rate, and SD = Standard Deviation. For our example above we will assume a risk free rate of 6% annualized for five years (risk free rates are generally considered to be the rate on three month Treasury Bills). The Sharpe Ratio for Manager C then becomes .82  $((15\% - 6\%) / 11\%)$ . For the index, the Sharpe Ratio is .67  $((12\% - 6\%) / 9\%)$ . Therefore, even though Manager C incurred more risk than the market to generate his excess return, we are being more than adequately compensated. Thus, Manager C's risk is deemed acceptable given our increased return because his Sharpe Ratio is greater than that of the index.

## **Investment Implications**

What does this mean to us as investors? First, the most important point to remember is that neither return nor risk should be analyzed in isolation. They are both important aspects of the investment equation and should be monitored together. After all, risk and return are generally thought of as a tradeoff. The more risk you take the more return you should expect to receive. Second, volatility is acceptable if you are being rewarded for it. Further, it is possible for returns to be less than the index and for the Sharpe Ratio to be greater than the index. In that case, you are still being adequately compensated for the level of risk you have assumed.