

# Three Key Measures of Price Volatility

## 1. Variance ( $\sigma^2$ )

Variance evaluates how much the realized return on a security varies from the mean. It essentially looks at the fluctuation of realized returns of a stock in a time span, and how far apart each realized return is from the stock's average return.

The higher the spread, the less favorable the variance is.

A high variance indicates a strong probability that our actual return is going to greatly differ from the expected one. Therefore: The lower the variance, the less risky the stock is.

If you are choosing between two investments that have the same expected return, always pick the one with lower variance.

As a statistical measure of dispersion, variance is calculated by a mathematical equation that takes into account past stock returns and the average return of the stock. It is evaluated by taking the differences between realized returns and the mean, squaring them to make them positive, and then dividing the sum of squares by the number of total individual values in the set.

We know, it sounds complicated if you're not a natural math person.

The advantage of variance lays in its ability to squeeze relevant insights out of data positioned above (+) and beyond (-) the mean. The most important disadvantages are that it is not easy to interpret and that it doesn't tell us anything about the stock's relationship with the market.

Evaluated on past performance data, variance is only a representation of possible future outcomes and should not be used alone when evaluating risk.

## 2. Beta ( $\beta$ )

Beta determines the sensitivity of a stock in comparison to movements in the stock market. Relating the volatility of individual stocks to the volatility of the market, beta tells to what degree a stock tends to move up or down in comparison to the market.

The market is said to have a constant beta of 1.0. Thus, a stock that mimics the market has a beta of 1.0.

If a stock has a beta lower than 1.0, the stock moves less than the market. Accordingly, if a stock has a beta higher than 1.0, the stock moves more than the market.

Given beta, how risky are stocks considered to be?

If  $\beta=1$ , a stock is risky as the market. If  $\beta<1$ , a stock is less risky than the market and offers lower returns. If  $\beta>1$ , a stock is riskier than the market and offers higher returns.

Here's another example:

In a bullish market, you may want to consider high beta securities – it will increase your chances of beating the market. Accordingly, in a bearish market, consider low betas. They decline less in value than the market.

Since it gives quantifiable data, beta is an unavoidable statistical tool for analyzing risk.

However, we should take note that beta has significant disadvantages too. Beta takes into account only past performance data, thus is exempt from giving insight into its future performance.

Also, it doesn't consider other relevant factors that may impact the future performance of a stock, such as the management of a company for example, which value investors do.

### 3 Standard Deviation ( $\sigma$ )

Standard deviation is another statistical instrument that helps us determine the dispersion of stock returns throughout time, whether it is one year, one month or one day. Although based on past performance indicators, standard deviation reveals the range of possible future outcomes.

It is calculated by taking the square root of variance of the stock in question, and it serves the purpose of telling us about the deviation or variability in an entire set of data.

It's pretty simple: The more volatile the returns in the past, the more unpredictable the future return may be.

Assume stock X that has a consistent return of 2% in three consecutive years, and stock Y that has a -25% return in year one, 5% return in year two and a 70% return in year three. Clearly, stock X never deviated from its initial return (Y1), therefore it has a standard deviation of 0. On the other hand, the return of stock Y fluctuated/deviated significantly year after year. This implies a high standard deviation.

The greater the volatility of returns, the higher the standard deviation is. And accordingly, the higher the standard deviation is, the greater the risk.

Before entering into a trade, ideally, take all three measures into account and evaluate your volatility. Especially useful for short-term risk evaluation, these statistical parameters will help you enter into a trade more confidently—especially if we're talking about thousands of dollars. The more parameters you take, the better your comprehension of risk is.

Remember: Never lose sight of the current market conditions. Also, take care not to disregard quantified measures that take into consideration the management of the company you trade. Value managers always inform themselves about the probability of the total possible loss (Value at Risk). Dig deeper and assess your risk and you will increase your chances of strong returns.