

A Review of Modern Portfolio Theory



If you were to craft the perfect investment, you would probably want its attributes to include high returns and low risk.

In reality, this kind of investment is next to impossible to find. Not surprisingly, people spend a lot of time developing methods and strategies that come close to the “perfect investment.” Yet most have not been as popular as modern portfolio theory (MPT).

Here, we look at the basic ideas behind MPT, the pros and cons, and how it affects how you should manage your portfolio.

The Theory

One of the most important and influential economic theories dealing with finance and investment, Modern Portfolio Theory (MPT) was developed by Harry Markowitz and published under the title "Portfolio Selection" in the 1952 *Journal of Finance*.

MPT says that it is not enough to look at the expected risk and return of one particular stock. By investing in more than one stock, an investor can reap the benefits of diversification— especially the potential reduction in the riskiness of the portfolio. **MPT quantifies the benefits of diversification, also known as not putting all of your eggs in one basket.**

For most investors, the risk they take when they buy a stock is that the return will be lower than expected. In other words, it is the deviation from the average historical return. Each stock has its own standard deviation, which modern portfolio theory calls "risk."

The risk in a portfolio of diverse individual stocks will be less than the risk inherent in holding an individual stock, provided the risks of the various stocks are not directly related. Consider a portfolio that holds two risky stocks: one that pays off when it rains and another that pays off when it doesn't rain. A portfolio that contains both assets will always pay off, regardless of whether it rains or shines. Adding one risky asset to another may reduce the overall risk of an all-weather portfolio.

In other words, Markowitz showed that investment is not just about picking stocks, but about choosing the right combination of stocks among which to own.

A portfolio's success rests on the investor's skills and the time he or she devotes to it. Sometimes it is better to pick a small number of out-of-favor investments and wait for the market to turn in your favor than to rely on market averages alone.

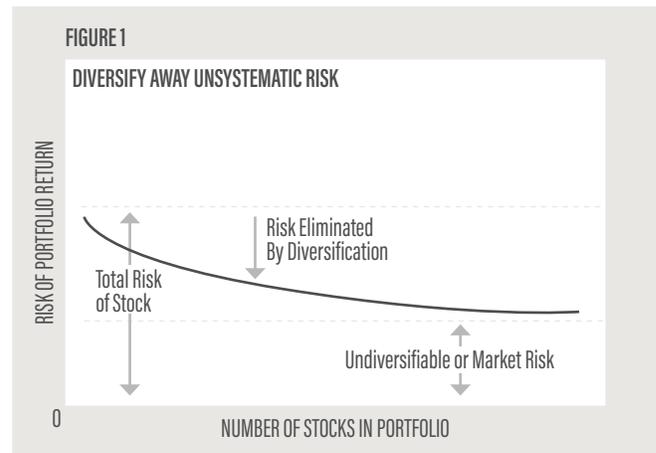
Two Kinds of Risk

Modern portfolio theory states that the risk for individual stock returns has two components:

Systematic Risk – These are market risks that cannot be diversified away. Interest rates, recessions and wars are examples of systematic risks.

Unsystematic Risk – Also known as "specific risk." This risk is specific to individual stocks and can be diversified away as you increase the number of stocks in your portfolio (see Figure 1). It represents the component of a stocks' return that is not correlated with general market moves.

For a well-diversified portfolio, the risk—or average deviation from the mean—of each stock contributes little to portfolio risk. Instead, it is the difference—or covariance—between individual stocks' levels of risk that determines overall portfolio risk. As a result, investors may benefit from holding diversified portfolios instead of individual stocks.



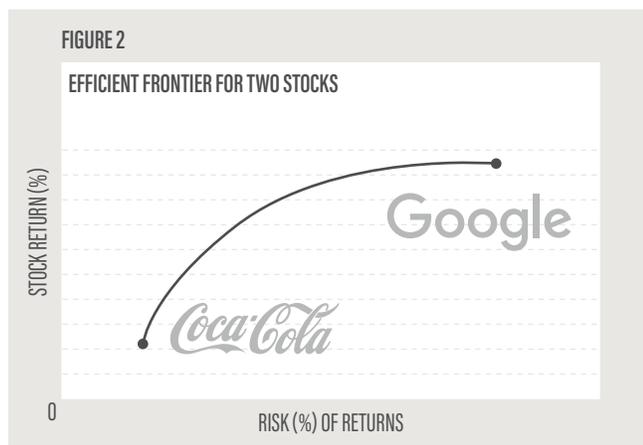
Source: Investopedia.com

Hypothetical example shown for illustrative purposes only. Does not represent any actual investment products.

The Efficient Frontier

Now that we understand the benefits of diversification, the question of how to identify the best level of diversification arises. Enter the efficient frontier.

For every level of return, there is one portfolio that offers the lowest possible risk, and for every level of risk, there is a portfolio that offers the highest return. These combinations can be plotted on a graph, and the resulting line is the efficient frontier. Figure 2 shows the efficient frontier for just two stocks—a high risk/high return technology stock (like Google) and a low risk/low return consumer products stock (like Coca-Cola).



Source: Investopedia.com

Any portfolio that lies on the upper part of the curve is efficient: it gives the maximum expected return for a given level of risk. A rational investor will only ever hold a portfolio that lies somewhere on the efficient frontier. The maximum level of risk that the investor is comfortable taking on determines the position of the portfolio on the line.

Modern portfolio theory takes this idea even further. It suggests that combining a stock portfolio that sits on the efficient frontier with a risk-free asset, the purchase of which is funded by borrowing, may actually increase returns beyond the efficient frontier. In other words, if you were to borrow to acquire a risk-free stock, then the remaining stock portfolio could have a riskier profile and therefore a potentially higher return than you might otherwise choose.

What MPT Means for Investors

Modern portfolio theory has had a marked impact on how investors perceive risk, return and portfolio management. The theory demonstrates that portfolio diversification may reduce investment risk. In fact, modern money managers routinely follow its precepts.

That being said, MPT has some shortcomings in the real world. For starters, it often requires investors to rethink notions of risk. Sometimes it demands that the investor take on a perceived risky investment (futures, for example) in order to reduce overall risk. That can be a tough sell to an investor not familiar with the benefits of sophisticated portfolio management techniques.

Furthermore, MPT assumes that it is possible to select stocks whose individual performance is independent of other investments in the portfolio. However, market historians have shown that there are no such instruments. In times of market stress, seemingly independent investments do act as though they are related.

Likewise, it is logical to borrow to hold a risk-free asset and increase your portfolio returns, but finding a truly risk-free asset is another matter. Government-backed bonds are presumed to be risk free, but, in reality, they are not. Securities such as gilts and U.S. Treasury bonds are free of default risk, but expectations of higher inflation and interest rate changes can both affect their value.

Then there is the question of the number of stocks required for diversification. How many is enough? Mutual funds can contain dozens and dozens of stocks. Investment guru William J. Bernstein says that even 100 stocks is not enough to diversify away unsystematic risk! By contrast, Edwin J. Elton and Martin J. Gruber in their book "Modern Portfolio Theory And Investment Analysis" (1981) conclude that you would come very close to achieving optimal diversity after adding the 20th stock.

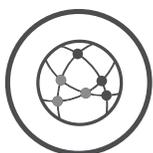
The gist of MPT is that the market is hard to beat and that the people who beat the market are those who take above-average risk. It is also implied that these risk takers will get their comeuppance when markets turn down.

Then again, investors such as Warren Buffett remind us that portfolio theory is just that—theory. At the end of the day, a portfolio's success rests on the investor's skills and the time he or she devotes to it. Sometimes it is better to pick a small number of out-of-favor investments and wait for the market to turn in your favor than to rely on market averages alone.

¹ Bernstein, William J. "The 15-Stock Diversification Myth." Efficient Frontier. William J. Bernstein. All rights reserved. Copyright 2000.

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