Capital Market Theory: Is It Relevant to Practitioners?

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Introduction

The short answer is: "Yes, it is relevant." Practitioners use capital market theory each time they put together a financial plan, a retirement plan or an investment plan for a client. The major academic theory the past 30 years is Capital Asset Pricing Model or CAPM. Professor William Sharpe (1964) won a portion of the Nobel Prize in Economics in 1990 for his original work on the CAPM. (There are three ways to pronounce CAPM: C-A-P-M, CAP-M (slight pause), and cap-em (no pause). The first pronunciation is the original pronunciation while the latter two are the modern slang pronunciations.)

Capital market theory is an important input to financial decision making. Therefore, an understanding of capital market theory is an important foundation in the training of a financial professional. Unfortunately for the finance professional trying to stay current in the field, capital market theory is in the process of changing from traditional models to newer theories. The next section explores the traditional CAPM and discusses the strengths and weaknesses of this classic model. Later, the paper explores the current research in capital market theory and discusses the implications of the modern theories for financial decision making.

The Old Theory

The CAPM is commonly confused with portfolio theory. Portfolio theory is simply the use of statistical and mathematical programming techniques to derive optimal tradeoffs between risk and return. Under very restrictive assumptions (rarely found in financial markets), the CAPM is a highly specialized subset of portfolio theory. Even so, the CAPM has become very popular as it provides a logical, common sense tradeoff between risk and return as in Figure 1.

Figure 1 -- Risk-Return Tradeoff for 1970-1994

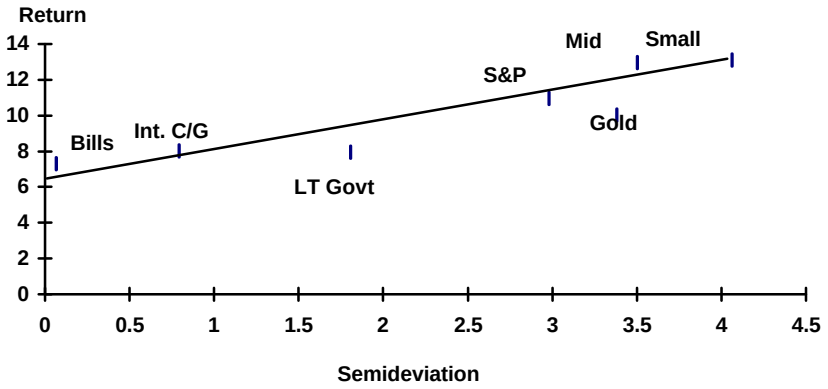
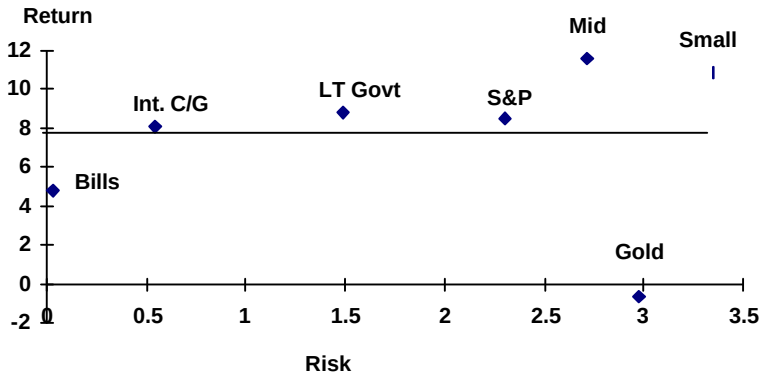


Figure 1 provides a graph of the historic returns and risk for different asset classes from 1970 to 1994. Table 1 presents the data for each asset class. Figure 1 plots such assets as small-cap stocks, mid-cap stocks, S&P 500 stocks, gold, intermediate corporate and government bonds, long term government bonds and 90 day treasury bills. Considering the data presented, there seems to be strong support for the CAPM.

Figure 1 provides an illusion that the theory works. Unfortunately, CAPM is an equilibrium model much like the supply and demand curves that students see in a first year economics course. As an equilibrium, the CAPM represents a "snapshot" of the market at one point in time. The theory says nothing about the relationship between risk and return over a 25-year period. After 30 years of research, academicians have still been unable to provide empirical support for the CAPM and its successor Arbitrage Pricing Theory (APT) model. Neither theory explains the operation of financial markets. To be fair, CAPM provides some useful insights. It provides the concept of diversifiable risk and nondiversifiable risk. As the names imply, some risk diversifies away but nondiversifiable risk cannot due to the effects of the overall economy. It also formalizes the intuitive idea of managing portfolios by switching between holding cash (short-term money market instruments) and risky investments (stocks and long term bonds). It was an important theory in the development of our understanding of financial markets. It is simply time to move on to more modern theories.

The market is dynamic and is constantly changing. It changes with new technology. Technology provides new products, makes old products obsolete, improves information flows to investors, and increases the number of economic transactions in the economy. .) The dynamic nature of the market provides different investment performance over time. An investor relying on Figure 1 to generate a financial plan will have had the actual results shown in Figure 2 for the 1990-1994 period. The return on gold is slightly negative and the rest of the asset classes do not provide additional return for additional risk. After purchasing intermediate Corporate/Government bonds, there is very little additional return gained, but significantly higher risks incurred by investing in the other asset classes. Obviously, a financial plan based on Figure 1 analysis is inappropriate for most clients.

Figure 2 -- Risk-Return Tradeoff for 1990-1994



The New Theories

One may ask what academics are researching while the CAPM is being used for purposes for which it is inappropriate. For the most part, they have been using all of their available fingers and toes trying to plug the leaky dike that is CAPM. (When the professors run out of fingers and toes, they use the fingers and toes of graduate students.) To be sure, the academic research never provided empirical support for the CAPM and recently the academic attacks on CAPM have become increasingly more powerful (Fama and French, 1992). The case against CAPM has become strong enough that portfolio theory itself is being questioned. However, portfolio theory has a great deal of flexibility and adaptability that is missing in the CAPM.

As a result, the finance academics do not have an alternative model to replace the CAPM and APT theories. The academic world does have an alternative: *systemic thinking*. While the general systems theory is not well known, individual components such as chaos theory, nonlinear risk measures, genetic algorithms, fractal analysis, and neural networks are appearing in the financial literature. Interestingly, the best work on capital market theory is by practitioners not by academics. Books by Hunt(1976,1987), Soros(1987), Vaga(1990,1994), Peters(1991,1994) and DeBoeck(1994) provide the best view of how financial markets actually work. Connelly(1996) provides a very interesting overview of these individual components.

The new theories represent a radical change in thinking from traditional models. Table 1 summarizes the differences between the old approach and the new approach.

Table 1 - Differences Between Traditional Systemic Thinking and Between Traditional and Systemic Values.

Thinking		Values	
Traditional	**Systemic**	**Traditional**	**Systemic**
Individual	Integrative	Expansion	Conservation
Rational	Intuitive	Competition	Cooperation
Analysis	Synthesis	Quantity	Quality
Reductionist	Holistic	Domination	Partnership
Linear	Nonlinear		

Source: Capra(1996)

The traditional approach is to reduce a system to its component parts and analyze each component as a separate independent system. The systemic approach is to study the system's interrelationships in order to understand the whole system. The reductionist approach as used with CAPM is to make assumptions in order to isolate the basic market mechanism. The basic assumptions are: (1) rational investors with homogeneous expectations and equal investment horizons, (2) no transaction costs, (3) no information costs, and (4) equal access to all available information. Effectively, investor behavior,

transaction costs, information costs, and information systems have been eliminated from the analysis.

It's not very difficult to add transaction costs, information costs, and less than perfect information systems to the current model. It is assumption (1) that causes the most problems. Homogeneous expectations imply that every investor has the same risk-return expectation for any given stock. In addition, every investor has the same short run investment horizon. Obviously, the market does not operate this way. We also know from nonlinear dynamics that if investors behaved according to these two conditions, the market would be so unstable that it would periodically crash and burn. A financial market exists because one party sells a security based on an expectation and the other party buys a security based on a different expectation.

Investor behavior is more complex than the simple rational investor of traditional theories. Among the issues are:

- There is the matter of wealth. The more wealth a person has, the more willing they are to invest a portion in risky investments. Very simply, the wealthier individual can afford the risk. For a good example, the next time you visit a gambling casino, check which people are playing the slot machines and which people are playing baccarat.
- The time horizon is also important. Risk is usually perceived as downward movements in the asset's value, thus affecting its liquidity. (It is difficult to sell an asset whose value has decreased by 30%.) Investors with short investment horizons are going to prefer high degrees of liquidity. Investors with long investment horizons do not need to be liquid and therefore can wait for an asset with a negative return to recover.
- Investors do not have a single investment goal. They compartmentalize their investment strategy. They will break investment decisions into different compartments and have a separate investment goal for each compartment. Investors may have different compartments for saving for retirement, saving for their children's education, or saving for a down payment for a car or house. The individual compartments contain different time horizons and different investment goals. (There is also an entertainment compartment that explains behavior like lotteries, gambling casinos, horse racing, baseball games, etc.)
- Investors do not maximize the outcome of their investment strategies. People use localized searches to solve problems. They will expand the area of search only if the localized search does not yield a satisfactory solution. Rarely, will people engage in the exhaustive search required for an optimal solution (Simon, 1955).
- Because of information costs, investors will have imperfect information (Soros, 1987). Some investors will choose to purchase information in order to be well informed in some area of the market. Other investors will choose to remain uninformed. Uninformed investors have two options: First, they can try to watch informed investors and deduce information from their actions or second, they can join cooperatives that hire informed investors to manage investments for the cooperative (Weiner, 1948). This cooperative behavior forms the basis for organizations such as

mutual funds, insurance companies and pension funds. A cooperative cannot provide an optimal investment solution to every member of the coop, but it can provide a satisfactory solution.

When the previous factors are added together, the resulting behavior by investors is much more complex than the behavior assumed by traditional financial theories. A much more complex theory is required.

According to Peters(1991), the stability of the market exists because of different expectations and different investment time horizons. An investor with a long-term investment horizon is going to react differently to short term information than a short-term investor. If there is a negative short-term change in expectations, the short investment horizon investors will sell the security. However, because there is not a change in the expectations of the long investment horizon investors, they will take advantage of the lowered prices to buy additional securities.

However, this does not provide a complete model of market behavior. A more complete theory is Vaga's(1990) coherent market theory. Vaga argues that the market is constantly changing over time and is a time-varying process. As technology, investor expectations, government policy variables and rate of financial innovation change, the market can experience different states -- steady state random walk, coherent cycles, and chaotic dynamics. Statistics may be used to describe Vaga's market states. The random walk has stable symmetric (normal) distributions. The coherent cycle stage has stable skewed (nonnormal) distributions. The chaotic state has unstable skewed distributions. What are the implications? A stable probability distribution (random walk and coherent markets) will exhibit persistence over time. In other words, the distribution provides reasonable expectations of future performance. In addition, a coherent market is going to exhibit regularities that make the market forecastable with simple models. An unstable chaotic distribution implies that simple models cannot forecast the future.

Studying Vaga's market states provides the interesting insight that his states relate to the business cycle. Vaga's approach is statistical. However, the business cycle can be approached from an economics perspective. Hunt (1987) and Stovall (1996) have done interesting work on the stock market and the business cycle. Both authors divide the business cycle into different phases. We can divide the business cycle into four phases with each phase corresponding to one of Vaga's market states. Four possible states of the business cycle are:

1. Easeoff --The Federal Reserve is trying to cool down a rapidly growing economy that is experiencing increasing rates of inflation. The rate of economic growth slows and reaches a peak in economic activity. Interest rates peak.
2. Plunge -- The Federal Reserve's anti-inflation policies cause a decline in economic activity (recession). A bottom (trough) occurs during this period. Interest rates and inflation decline during this period.

3. Revival -- The economy starts a recovery with strong economic growth, low inflation and low interest rates.
4. Accelerate -- The economy continues strong growth, however, capacity utilization starts to reach its limits and the economy overheats increasing the inflation rate.

A summary of the relationship between the economic cycle and Vaga's market states is in Table 2. These relationships derive from a study by Nawrocki and Carter(1996).

Table 2 -- Phases of the Business Cycle and Vaga's Market States and resulting portfolio strategies (1970 to 1994)

Economic Phase	Easeoff	Plunge	Revival	Accelerate
Economic Activity	Reaches Peak	Falls	Recovers	High
Interest Rates	High	Falls	Low	High
Inflation	High	Low	Low	High
Equity Returns	Highest	High	High	Negative
Risk	Average	Lower	Lowest	Highest
Vaga's State	Coherent	Random Walk	Coherent	Chaotic
Distribution	Stable	Stable	Stable	Unstable
Skewness	Skewed	Symmetric	Skewed	Skewed
Forecasting Ability	Good	Poor	Fair	Poor
Equity Portfolio Strategy	Fundamental Technical Market Timing	Buy&Hold Diversified Portfolio	Fundamental Analysis	Buy T-Bills Take a Vacation
Average Length of Cycle	8 Months	12.6 Months (53.2 Months)	18.8 Months	13.8 Months

While everything looks easy, it is not. The business cycle is nonperiodic; that is, it varies in lengths from 18 months to 8-10 years. The average economic cycle is 53.2 months long, which is close to Peters'(1991) 48-month average cycle for the stock market. Changes in phases are hard to detect and are important. Using a market timing method well into a random walk or chaotic market will hurt portfolio returns. A buy-and-hold-diversified strategy will lose the opportunity to earn higher returns during coherent states and will exhibit negative returns during a chaotic state.

Reacting to the business cycle requires the portfolio manager to look at a shorter, more recent historic period. Using 20-30 years of data to do asset allocation does not take into account technological change and the varying states of the financial markets.

The implications of Vaga's model are as follows:

1. Investment managers need to examine closely the assumptions behind the forecasts used in making investment decisions.
2. Shorter time periods encompassing the most recent business cycle are necessary for estimating expected returns and risk used in making asset allocation decisions.
3. Investment managers are not necessarily in the business of market timing per se with this model. The model simply recommends a strategic shift to treasury bills during chaotic market periods. The investment manager can follow the business cycle with a well-diversified portfolio and then switch to treasury bills during the accelerate phase of the economy. There may also be an opportunity to invest in foreign stocks while the US economy is in an accelerate phase.
4. The investment manager is not forecasting the economy. A portfolio switching (sector rotation) strategy is simply reacting and adapting to changes in business conditions (the business cycle).
5. Modern portfolio theory (MPT) is still relevant in a coherent market theory world. It simply has to be used very carefully. Since the investor compartmentalizes his/her investment decision, then the asset allocation problem may be set up in each compartment. The unique utility function for each compartment selects the appropriate portfolio for the compartment.
6. Until the technology to handle chaotic market periods (accelerate phase) is developed, buy treasury bills and take a vacation. For the past 25 years, treasury bills outperform stock investments during accelerate phases. The last accelerate phase was in 1994 when Treasury bill returns were higher than the S&P returns. It is interesting that Hunt(1987) came to the same conclusion ten years ago. In his book, he discusses the investment managers in his firm taking Caribbean vacations during accelerate phases. Their only problem was to get back to New York in time before the start of the next coherent phase. So somebody drew the short straw and had to stay in the office to monitor the economy. (They also seemed to have very understanding clients.)

To summarize, the classic CAPM theory is too simplistic. Modern theories of capital market behavior study the financial markets as complex dynamic processes. The theories themselves are more complex. However, they provide an improved understanding of how the financial markets operate. This understanding of the financial markets is crucial to the investment decision making process and therefore, to practitioners.

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The capital market theory builds on portfolio theory and leads to the capital asset pricing model. This theory begins with the efficient frontier, which depicts the return-risk relationship for portfolios consisting of risky assets.Â The theory states that there is an alternative to investing only in risky assets; it is to invest in a riskless asset, defined as an asset whose return (RF) has no standard deviation (ï³ = 0). Given the correlation rxy between two assets, x and y, and their respective standard deviations, the covariance isÂ Thus, the relevant risk measure for an individual risky asset is its covariance with the market portfolio, also known as its systematic risk.