

UNIT – V (SAPM)

1. The Fama – French Model
2. The Arbitrage Pricing Theory

Alternative Pricing Models

The Capital Asset Pricing Model (CAPM)

Challenges to CAPM

- Empirical tests suggest:
 - CAPM does not hold well in practice:
 - Ex post SML is an upward sloping line
 - Ex ante y (*vertical*) – intercept is higher than RF
 - Slope is less than what is predicted by theory
 - Beta possesses no explanatory power for predicting stock returns (Fama and French, 1992)
- CAPM remains in widespread use despite the foregoing.
 - Advantages include – relative simplicity and intuitive logic.
- Because of the problems with CAPM, other models have been developed including:
 - Fama-French (FF) Model
 - Arbitrage Pricing Theory (APT)

Alternative Asset Pricing Models

The Fama – French Model

- A pricing model that uses three factors to relate expected returns to risk including:
 1. A market factor related to firm size.
 2. The market value of a firm's common equity (MVE)
 3. Ratio of a firm's book equity value to its market value of equity. (BE/MVE)
- This model has become popular, and many think it does a better job than the CAPM in explaining ex ante stock returns.

Alternative Asset Pricing Models

The Arbitrage Pricing Theory

- A pricing model that uses multiple factors to relate expected returns to risk by assuming that asset returns are linearly related to a set of indexes, which proxy risk factors that influence security returns.

$$ER_i = a_0 + b_{i1}F_1 + b_{i2}F_2 + \dots + b_{in}F_n$$

- It is based on the no-arbitrage principle which is the rule that two otherwise identical assets cannot sell at different prices.
- Underlying factors represent broad economic forces which are inherently unpredictable.

Alternative Asset Pricing Models

The Arbitrage Pricing Theory – the Model

- Underlying factors represent broad economic forces which are inherently unpredictable.

$$ER_i = a_0 + b_{i1}F_1 + b_{i2}F_2 + \dots + b_{in}F_n$$

- Where:
 - ER_i = the expected return on security i
 - a_0 = the expected return on a security with zero systematic risk
 - b_i = the sensitivity of security i to a given risk factor
 - F_i = the risk premium for a given risk factor
- The model demonstrates that a security's risk is based on its sensitivity to broad economic forces.

Alternative Asset Pricing Models

The Arbitrage Pricing Theory – Challenges

- Underlying factors represent broad economic forces which are inherently unpredictable.
- Ross and Roll identify five systematic factors:
 1. Changes in expected inflation
 2. Unanticipated changes in inflation
 3. Unanticipated changes in industrial production
 4. Unanticipated changes in the default-risk premium
 5. Unanticipated changes in the term structure of interest rates
- Clearly, something that isn't forecast, can't be used to price securities today...they can only be used to explain prices after the fact.

Summary and Conclusions

- How the efficient frontier can be expanded by introducing risk-free borrowing and lending leading to a super efficient frontier called the Capital Market Line (CML)
- The Security Market Line can be derived from the CML and provides a way to estimate a market-based, required return for any security or portfolio based on market risk as measured by the beta.
- That alternative asset pricing models exist including the Fama-French Model and the Arbitrage Pricing Theory.