Extension
of
Capital Asset Pricing Model

Capital Asset Pricing Model

Capital Asset Pricing Model for individual share:

$R_i = (R_m - R_f)\ \beta m + R_f$

R_i =Return of individual stock

R_m =Return of Market

B_m =Coefficient= Constant

R_f =Risk free rate of return

Capital Asset Pricing Model

Capital Asset Pricing Model for portfolio:

R_p $=(R_m-R_f)\ \beta m + R_f$

R_p =Return of portfolio

R_m =Return of Market

B_m =Coefficient= Constant

R_f =Risk free rate of return

After CAPM Model

- Eugene Fama & Kenneth French observes that 70% of price change can be explained by traditional CAPM model i.e. market risk of an individual share (or a portfolio) could explain upto 70%
- Example for 5 % rise in stock market index
- They observed in the stock market (a) value stocks outperform growth stock and also
- (b) Small-Cap Stock tend to outperform Large-Cap Stock

After CAPM

- Risk: (a) Small-Cap. Share Vs. Large-Cap. Stock: Size risk
- Risk: (b) High value Share Vs. Low Value Share: Value Risk

- They found two risk factors of individual stock (or portfolio) are also important to explain
- (i) Size Risk and (ii) Value Risk

Size Risk

- Small Company Vs. Big Company
- Small Company= Small Size Company= Company with low market capitalisation
- Big Company= Big Sized Company= Company with high market capitalisation
- Difference between small and big company = SMB= Market Capitalisation of Small Company- Market Capitalisation of Big Company

Value Risk

- High Value Company Vs. Low Value Company
- High Value Company= High Book Value Company (in relative terms)= (Book Value/ Market price) of the High Value company
- Low Value Company= Low Book Value Company (in relative terms)= (Book Value/ Market price) of the low Value company
- Difference between High Value Company and Low Value Company= (BPS/MPS) of High Value Company in the Market) – (BPS/MPS) of Low company in the market

Fama-French Three Factor Model

$R_i = (R_m - R_f)\,\beta 1 + R_f + \beta_2 * SMB + \beta_3 * HML$

Ri =Return of individual stock

R_m =Return of Market

B_m =Coefficient= Constant

R_f =Risk free rate of return

$\beta_1, \beta_2, \beta_3$= Co-efficient= Constant

β_1= Market Risk coefficient , β_2= Size Risk coefficient, β_3 = Value Risk coefficint

Fama-French Three Factor Model

- Fama & French (1992) observed that 90% of the price chages could be explained by the three factor model

Reason of Success of Model

- Fama & French (1992): From viewpoint of market efficiency: Small cap stocks can not absorb macro risk and thus are more risky and compensates
- Some argues that there was inefficiency in the market to catch up