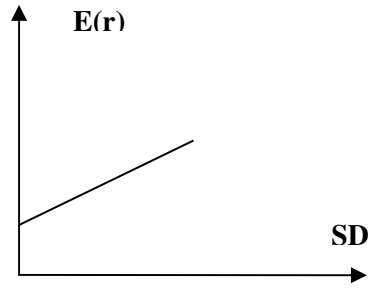
ECON 133 – Securities Markets – FALL 2010, UCSC
HOMEWORK # 3 AK

1. E(r)=20%*(-5%)+20%*10%+60%*20%=13%
   SD=[20%*(-5%-13%)^2+20%*(10%-13%)^2+60%*(20%-13%)^2]^0.5=9.8%
2. Sharpe ratio=(13%-5%)/9.8%=0.82



3. E(r)=75%*13%+25%*5%=11%
   SD=75%*9.8%=7.35%
4. E(r)=125%*13%-25%*7%=14.5%
   SD=125%*9.8%=12.25%
5. 12%=y*13%+(1-y)*5%, y=7/8
   SD=9.8%*7/8=8.6%
6. 8%=y*9.8%, y=81.6%
   E(r) =81.6%*13%+(1-81.6%)*5%=11.5%
7.
   a. Subscript OP refers to the original portfolio, ABC to the new stock, and NP to the new portfolio.

      i. $E(r_{NP}) = w_{OP}\, E(r_{OP}) + w_{ABC}\, E(r_{ABC}) = (0.9 \times 0.67) + (0.1 \times 1.25) = 0.728\%$

      ii. $Cov = r \times \sigma_{OP} \times \sigma_{ABC} = 0.40 \times 2.37 \times 2.95 = 2.7966 \cong 2.80$

      iii. $\sigma_{NP} = [w_{OP}^2\, \sigma_{OP}^2 + w_{ABC}^2\, \sigma_{ABC}^2 + 2\, w_{OP}\, w_{ABC}\, (Cov_{OP,\,ABC})]^{1/2}$

      $= [(0.9^2 \times 2.37^2) + (0.1^2 \times 2.95^2) + (2 \times 0.9 \times 0.1 \times 2.80)]^{1/2}$

      $= 2.2673\% \cong 2.27\%$

b. Subscript OP refers to the original portfolio, GS to government securities, and NP to the new portfolio.

i. $E(r_{NP}) = w_{OP}\, E(r_{OP}) + w_{GS}\, E(r_{GS}) = (0.9 \times 0.67) + (0.1 \times 0.42) = 0.645\%$

ii. $Cov = r \times \sigma_{OP} \times \sigma_{GS} = 0 \times 2.37 \times 0 = 0$

iii. $\sigma_{NP} = [w_{OP}^2\, \sigma_{OP}^2 + w_{GS}^2\, \sigma_{GS}^2 + 2\, w_{OP}\, w_{GS}\, (Cov_{OP,GS})]^{1/2}$

$= [(0.9^2 \times 2.37^2) + (0.1^2 \times 0) + (2 \times 0.9 \times 0.1 \times 0)]^{1/2}$

$= 2.133\% \cong 2.13\%$

8. According to the theory advanced in William Sharpe's dissertation, what was the key to a security's returns?

Covariance with market returns.