Homework #6 (Chapter 12)

12.3 $R_S = 6\% + 1.15*10\% = 17.5\%$
$R_B = 6\% + 0.3*10\% = 9\%$
  a. Cost of equity= $R_S = 17.5\%$
  b. $B/S = 0.25$
$B/(B+S) = 0.2$
$S/(B+S) = 0.8$
WACC=$0.8*17.5\% + 0.2*9\%(1-0.35)$
=15.17%

12.8 a. Pacific cosmetics should use its stock beta in the evaluation of the project only if the risk of the perfume project is the same as the risk of Pacific Cosmetics.
  b.   If the risk of the project is the same as the risk of the firm, use the firm's stock beta. If the risk differs, then use the beta of an all-equity firm with similar risk as the perfume project. A good way to estimate the beta of the project would be to average the betas of many perfume producing firms.

12.9 $E(R_S)=0.1*3+0.3*8+0.4*20+0.2*15=13.7\%$
$E(R_B)=0.1*8+0.3*8+0.4*10+0.2*10=9.2\%$
$E(R_M)=0.1*5+0.3*10+0.4*15+0.2*20=13.5\%$

State	$\{R_S-E(R_S)\}\{R_M-E(R_M)\}Pr$	$\{R_B-E(R_B)\}\{R_M-E(R_M)\}Pr$
1	(0.03-0.137)(0.05-0.135)*0.1	(0.08-0.092)(0.05-0.135)*0.1
2	(0.08-0.137)(0.10-0.135)*0.3	(0.08-0.092)(0.10-0.135)*0.3
3	(0.20-0.137)(0.15-0.135)*0.4	(0.10-0.092)(0.15-0.135)*0.4
4	(0.15-0.137)(0.20-0.135)*0.2	(0.10-0.092)(0.20-0.135)*0.2
Sum	0.002056	0.00038
	= $Cov(R_S,R_M)$	=$Cov(R_B,R_M)$

$\sigma_M{}^2 = 0.1(0.05-0.135)^2+0.3(0.10-0.135)^2+0.4(0.15-0.135)^2+0.2(0.20-0.135)^2$
=0.002025

  a. Beta of debt= $Cov(R_B,R_M)/\sigma_M{}^2=0.00038/0.002025=0.188$
  b. Beta of stock= $Cov(R_B,R_M)/\sigma_M{}^2=0.002055/0.002025=1.015$
  c. $B/S=0.5$
Thus, $B/(S+B)=1/3=0.3333$
$S/(S+B)=2/3=0.6667$
Beta of asset=$0.188*0.3333+1.015*0.6667=0.739$

12.13   B=$60 million*1.2=$72 million
S=$20*5 million= $100 million
$B/(S+B)=72/172=0.4186$
$S/(S+B)=100/172=0.5814$
WACC=$0.4186*12\%*0.75+0.5814*18\%=14.23\%$

12.14   S=\$25* 20 million= \$500 million
        B= 0.95*\$180 million=\$171 million
        $B/(S+B)=0.2548$
        $S/(S+B)= 0.7452$
        WACC=0.7452*20%+0.2548*10%*0.60
            =16.43%

12.16   WACC=(0.5) * 28%+ (0.5) *10% * (1-0.35)=17.25%
        NPV= -\$1,000,000+(1-0.35)\$600,000 $A^5_{0.1725}$
            =\$240,608.50