CHAPTER 6

BETA ESTIMATION AND THE COST OF EQUITY

Problem 1

	Sensex, r_M	Delite, r_D	$(r_M - .0284) \times (r_D - .079)$
	-0.1250	-0.0510	0.0199
	0.0170	0.0670	0.0001
	0.0720	0.0710	-0.0003
	0.1150	0.1890	0.0095
	0.0630	0.1190	0.0014
Average	0.0284	0.0790	
Stdev	0.0925	0.0878	
Variance	0.0086	0.0077	
Cov			0.0061
Beta	Covar/Var_M		0.72

You can use the built-in Excel formulae for calculating standard deviation, variance and covariance.

Problem 2

Beta	1.21
Risk free rate	8.5%
Risk premium	9.5%
Opportunity cost of capital: 8.5% + 9.5% × 1.21	20%
Project's expected return	20%

The project's expected return is just equal to the opportunity cost of capital. The firm *may* accept it.

Problem 3

Correlation – Market & excel	0.725
Variance - Excel	0.006455
Variance - Market	0.001589
Standard deviation - Excel	0.080343
Standard deviation - Market	0.039862
Beta: 0.725 × 0.080343/0.039862	1.46

Problem 4

Months	**HLL r**	**Sensex r**	**HLL r^2**	**Sensex r^2**	**HHL r × Sensex r**
1	-1.20	-3.50	1.44	12.25	4.20
2	-2.70	-5.10	7.29	26.01	13.77
3	-8.60	-4.30	73.96	18.49	36.98
4	-3.00	-7.50	9.00	56.25	22.50
5	-0.30	-4.80	0.09	23.04	1.44
6	-1.90	-1.90	3.61	3.61	3.61
7	-0.50	-1.50	0.25	2.25	0.75
8	-0.80	-4.60	0.64	21.16	3.68
9	3.30	4.10	10.89	16.81	13.53
10	1.30	0.00	1.69	0.00	0.00
11	0.30	2.00	0.09	4.00	0.60
12	-0.50	-0.20	0.25	0.04	0.10
13	6.00	3.90	36.00	15.21	23.40
14	-6.00	-10.10	36.00	102.01	60.60
15	-2.50	-3.50	6.25	12.25	8.75
Sum	-17.10	-37.00	187.45	313.38	193.91
Average	-1.14	-2.47			

Correlation	0.79
Cor^2	0.62
Std. Error	2.22
Observations	15.00
Alpha	0.55
Beta	0.68
Var HLL r	12.00
Var Sensex r	15.87
Systematic risk	7.40
Unsystematic risk	4.59

Problem 5

	A	B	C
Alpha	1.53	-0.65	0.85
Beta	0.89	1.18	1.29
Correlation	0.78	0.83	0.65
Correlation square	0.61	0.69	0.42
Systematic risk	0.61	0.69	0.42
Unsystematic risk	0.39	0.31	0.58

Problem 6

Beta (asset beta of an all-equity financed firm)	1.21
Risk-free rate	6.5%
Market premium	9.0%
Debt ratio	30%
Equity ratio	70%
Equity beta (leveraged firm): 1.21/0.70	1.73
Expected equity return: 6.5% + 9% × 1.73	22.1%

Problem 7

Risk-free rate	0.09				
Market return	0.16				
Risk premium	0.07				
Share	A	B	C	D	
Beta	0.8000	1.2500	1.0000	0.6000	
Return	0.1460	0.1775	0.1600	0.1320	Total
Investment	100,000	100,000	75,000	125,000	400,000
Weight	0.2500	0.2500	0.1875	0.3125	1.0000
Portfolio return	0.0365	0.0444	0.0300	0.0413	0.1521