S370 Homework 2 Answers Spring 2010 – Prof. W. E. Becker

Due 2/5/2010 in WY105 by 9:00am

4.11 A. Coefficient of variation is 1000/1000 = 1.00 for investment X and 450/900 = .05 in investment Y.

B. If the distribution of returns are bell-shaped and continuous, X will give a return of less than 0 with a probability of 16%, and Y will give a return of less than 0 with probability of 2.5%.

C. Coefficient of variation shows that investment Y is less risky than investment X. Thus, the probability of losing money in Y is smaller. This is precisely what answer (b) indicates.

4.12 A. E(x) = 3.00 (see below) B. Standard deviation = 1.24 (see below)

X	P(X)	X * P(X)	[X - E(X)]^2	P(X) * [(X - E(X)]^2
0	0.02	0	9	0.18
1	0.09	0.09	4	0.36
2	0.23	0.46	1	0.23
3	0.32	0.96	0	0
4	0.23	0.92	1	0.23
5	0.09	0.45	4	0.36
6	0.02	0.12	9	0.18
	E(X) =	3	Variance =	1.54
			Std. Dev =	1.240967365

4.26

a. b) E(X) = E(Y) = 2.3 (see below)

X = Y	P(X) = P(Y)	P(X)*X = P(Y)*Y
1	0.4	0.4
2	0.1	0.2
3	0.3	0.9
4	0.2	0.8

	E(X) = E(Y) =	2.3

4.28

a) b) VAR X = VAR Y = 1.41 (see below)

X = Y	P(X) = P(Y)	P(X)*X = P(Y)*Y	[X - E(X)]^2	P(X) * [X - E(X)]^2
1	0.4	0.4	1.69	0.676
2	0.1	0.2	0.09	0.009
3	0.3	0.9	0.49	0.147
4	0.2	0.8	2.89	0.578
	E(X) = E(Y) =	2.3	Variance =	1.41

4.29

a. E(X + Y) = E(X) + E(Y) = 20 + 15 = $35
b. VAR(X + Y) = VAR(X) + VAR(Y) + S(COV(X,Y) = 19 (square $)

4.31

a. E(X) = 1.75 calls per day. (see below)
b. Standard Deviation = 1.1347 calls per day. (see below)
c. Because the mean (1.75 calls per day) is greater than the mode

(1.00 calls per day) and the implied median, the probability mass function is

right (or positive) skewed as seen in the below diagram.

X	P(X)	X * P(X)	[X - E(X)]^2	P(X) * [X - E(X)]^2
0	0.1	0	3.0625	0.30625
1	0.4	0.4	0.5625	0.225
2	0.25	0.5	0.0625	0.015625
3	0.15	0.45	1.5625	0.234375
4	0.1	0.4	5.0625	0.50625
	E(X) =	1.75	Variance =	1.2875

			Std. Dev =	1.134680572

4.47

The break even insurance premium is $1,900.

0.01	* 90000 =	900
0.05	* 20000 =	1000
0.94	* 0 =	0
		$1,900

For the company to have zero debt or zero profit (break-even point), they must purchase an insurance premium of $1,900.