BS2551 Money Banking and Finance

Seminar 3 Solution

Suppose you have two stocks C and D, with the following probability distributions.

State	Prob	Return C	Return D
Boom	0.2	24%	5%
Growth	0.6	12%	30%
Slump	0.2	0%	-5%

a) Expected return of C = 24*(0.2) + 12*(0.6) + 0*(0.2) = 12%.

Standard Deviation of C = 24^2*(0.2) + 12^2*(0.6) + 0^2*(0.2) = 201.6 – $(12)^2$ = 57.66. $\sqrt{57.66}$ = 7.59

Using the same methodology as above compute the expected return and standard deviation of stock D.

Expected Return (D) = 18%, St Dev (D) = 15.03%.

b) Covariance between stocks C and D.

(24% - 12%) * (5% - 18%) * 0.2 = -31.2

(12% - 12%) * (30% - 18%) * 0.6 = 0

(0% - 12%) * (-5% - 18%) * 0.2 = 55.2

Covariance equals $-31.2 + 55.2 = 24$.

c) Expected Return of Portfolio
$= (0.5)*(0.12) + (0.5)*(0.18) = 15\%$.

Standard Deviation of Portfolio

$=(0.5)^2*(0.0759) + (0.5)^2*(0.1503) + 2*(0.5)*(0.5)*(24) = 12.06$

Standard Deviation $= 12\%$.

d) C is the less risky stock with the smallest st dev and the smallest return, so would be preferred by risk averse investors.

e) D is the most risky with the largest st dev and the highest return, so would be preferred by risk lovers.

Investment in a portfolio means that risk is reduced and return is higher then C but smaller then D, so seems sensible for rational investors.

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