

FIN 410 Investments

Sample EXAM II: E&G Chapters 4, 5, 7, 8, 18, 19

Answer all questions. You have 90 minutes to complete this exam. Use your time wisely. There are 50 points possible. Points assigned to each question appear in margin beside question.

In accord with School policy, the following pledge must be signed by all students on all exams:

“On my honor, I have neither given nor received any unauthorized aid on this exam. Nor am I aware of anyone giving or receiving any unauthorized aid on this exam.”

Signature

Date

1. A. In Brazil, suppose the average variance of return for an individual security is 10, and the average covariance between returns in any two securities is 2.
 - (5) i. what is the expected variance of an equally weighted portfolio of 20 stocks in Brazil?
 - ii. how many securities must be held in an equally weighted portfolio in Brazil before the expected portfolio risk (s_p^2) is only 10% higher than the minimum risk possible?
- B. You wish to form a portfolio from two assets with the following attributes:
 $E(R_1) = 4\%$; $s_1 = 4$; $E(R_2) = 8\%$; $s_2 = 12$; and $s_{12} = -48$.
 - (5) Assuming there is no short selling, and no borrowing or lending is allowed at any riskfree rate, what is $E(R_p)$ and s_p for the minimum risk portfolio attainable?
 - (5) C. Assume short selling is allowed, and you can lend or borrow unlimited amounts at the riskfree rate. What does the opportunity locus look like in these circumstances?
2. You wish to use a valuation model to determine whether stock XXX is undervalued at today's current market price ($P_t = \$40/\text{share}$). The next annual dividend of firm XXX will be paid in one year, at $D = \$.90/\text{share}$.
 - (5) A. Use the one-period growth model, and assume that:
 - i. firm XXX will maintain a stable dividend policy [i.e., $D_t = (1-b)E_t$, where D_t = dividend in period t, E_t = earnings in period t, and $b = .5$]; and
 - ii. firm XXX will earn a stable return on investment ($r = .18$).Given these assumptions, what is your expected annual growth of dividends indefinitely?
Use the one-period growth model described above, along with the assumption that firm XXX has a cost of capital of $k = .12$, and determine whether this stock is currently undervalued.
 - (5) C. Given the one-period growth model and the other information in parts A. and B., what return (k^*) is stock XXX expected to pay if bought at its current market price?

3. Suppose that $E(R_m) = .06$ and $s_m^2 = 10$, and you estimate the single-index model for three securities, and obtain the following:

<u>Security i</u>	<u>a_i</u>	<u>β_{im}</u>	<u>s_{ei}^2</u>
1	.016	.4	12
2	.006	.9	4
3	.004	1.1	1

- (5) A. Assuming that the single-index model holds, give the expected returns, variances, and covariances for these three securities. Show your work.
- (5) B. Of these three securities, security #1 has the smallest expected return, but the largest return variance (total risk). Explain why this is so.
4. Suppose you estimate the following industry index model for the same three securities as in problem 3 above:

$$R_i = a_i + b_{im} R_M + b_{ik} I_k + c_i ;$$

where R_m is the market index return and I_k is an index measuring the average return in the k^{th} industry, of which the i^{th} firm is a member. Further, suppose firms 1 & 2 are in the same industry (I_A), but firm 3 is in a different industry (I_B). Your results for these three securities are:

<u>Security i</u>	<u>industry k</u>	<u>a_i</u>	<u>b_{im}</u>	<u>b_{iA}</u>	<u>b_{iB}</u>	<u>s_{ei}^2</u>
1	A	.012	.4	.2	0	11.6
2	A	.004	.9	.1	0	3.9
3	B	.001	1.1	0	.1	.9

- (10) A. Assuming that the industry index model holds, and that $E(R_m) = .06$ and $s_m^2 = 10$, as before, and further assuming that $E(I_A) = .02$, $E(I_B) = .03$, and $s_A^2 = s_B^2 = 10$, what are the expected returns, variances, and covariances for these three securities? Show your work.
- (5) B. Compare the **covariances** for these three securities obtained in part 4.A. above with those obtained earlier in problem 3.A. Explain any similarities or differences.