

Class 5
Multifactor models and the APT

Reading: GT: Chapter 6.

Question 1

The following question illustrates the APT. Imagine that there are only two pervasive macroeconomic factors. Investments X, Y, and Z have the following sensitivities to these two factors:

Investment	b_1	b_2
X	1.75	.25
Y	-1.00	2.00
Z	2.00	1.00

We assume that the expected risk premium is 4 percent on factor 1 and 8 percent on factor 2. Treasury bills obviously offer zero risk premium.

- a. According to APT, what is the risk premium on each of the three stocks?
- b. Suppose you buy \$200 of X and \$50 of Y and sell \$150 of Z. What is the sensitivity of your portfolio to each of the two factors? What is the expected risk premium?
- c. Suppose you buy \$80 of X and \$60 of Y and sell \$40 of Z. What is the sensitivity of your portfolio to each of the two factors? What is the expected risk premium?
- d. Suggest two possible ways that you could construct a fund that has a sensitivity of .5 to factor 1 only. (Hint: One portfolio contains an investment in Treasury bills). Now compare the risk premiums on each of these two investments.
- e. Suppose that the APT did not hold and that X offered a risk premium of 8 percent, Y offered a premium of 14 percent, and Z offered a premium of 16 percent. Devise an investment that has zero sensitivity to each factor and that has a positive risk premium.