

Mgt 890: Corporate Finance and Options

Spring 2001

Homework Set #5

Due Tuesday February 6

1. The following table shows estimates of the risk of two well-known stocks during the ten years ending January 2001:

	STANDARD DEVIATION	R ²	BETA	STANDARD ERROR OF BETA
Glaxo Wellcome	18%	.38	.90	.11
British Petroleum (BP)	21	.26	.98	.14

- Which stock had price changes that were most closely related to the market? What proportion of that stock's risk was market risk, and what portion was unique risk?
- What is the variance of Glaxo Wellcome? What is the unique variance?
- What is the confidence level on BP's beta (or, t-statistic)?
- If the CAPM is correct, what is the expected return on Glaxo Wellcome? Assume a risk-free interest rate of 5 percent and an expected market return of 10 percent.
- Suppose the next year the market is expected to have a zero return. What return would you expect from Glaxo Wellcome?

2. Mixed Products has three operating divisions:

DIVISION	PERCENTAGE OF FIRM VALUE
Food	50
Electronics	35
Chemicals	25

To estimate the cost of capital for each division, Mixed has identified the following three principal competitors:

	ESTIMATED EQUITY BETA	DEBT/(DEBT + EQUITY)
United Foods	.9	.3
General Electronics	1.5	.2
Associated Chemicals	1.4	.4

Assume these betas are accurate estimates and that the CAPM is correct.

- Assuming that the debt of these firms is risk-free, estimate the asset beta for each of Mixed's divisions.
- Mixed's ratio of debt to debt plus equity is .4. If your estimates of divisional betas are right, what is Mixed's equity beta?

- (c) Assume that the risk-free interest rate is 5 percent and that the expected return on the market index is 15 percent. Estimate the cost of capital for each of Mixed's divisions.
- (d) How much would your estimates of each division's cost of capital change if you assumed that debt has a beta of .2?

3. Mom and Pop Groceries has just dispatched a year's supply of groceries to the government of the Central Antarctic Republic. Payment of \$500,000 will be made one year hence after the shipment arrives by snow train. Unfortunately, there is a good chance of a coup d'etat, in which case the new government will not pay. Mom and Pop's controller therefore decides to discount the payment at 45 percent, rather than at the company's 15 percent cost of capital.

- a). What's wrong with using a 45% rate to offset political risk?
- b). How much is the \$500,000 payment really worth if the odds of a coup d'etat are 30%?

4. Standard Oil of Indiana has a debt-equity ratio of about 0.1, and Standard Oil of Ohio has a debt-equity ratio of about 0.4. ("Indiana Standard" and "Sohio" are separate companies, in spite of sharing credit cards and part of their name.) Both produce most of their oil in the United States and market most of their products in the Midwest, and their business risk is approximately identical. If the beta of Indiana Standard's stock is about 0.8, what is the beta of Sohio's stock if both have zero beta debt?

5. An oil company is drilling a series of new wells on the perimeter of a producing oil field. About 20 percent of the new wells will be dry holes. Even if a new well strikes oil, there is still uncertainty about the amount of oil produced: 45 percent of new wells which strike oil produce only 2,000 barrels a day; 55 percent produce 5,000 barrels per day.

- (a) Forecast the annual cash revenues from a new perimeter well. Use a future oil price of \$20 per barrel.
- (b) A geologist proposes to discount the cash flows of the new wells at 40 percent to offset the risk of dry holes. The oil company's normal cost of capital is 15 percent. Does this proposal make sense? Briefly explain why or why not.