

Econ 134A Homework 2:

This assignment is due April 21st in lecture. Show your work and intermediate steps (the equations used, the numbers, etc.) and support or explain your answers where appropriate. Put your TAs name on your homework, and be prepared to turn it in to your TA's homework pile.

1. A bond with a semi-annual (twice a year) coupon payment is sold for \$1160.584, which is above its par value of \$1000. The bond is 12 years to maturity and the yield currently required by the market for such bonds is seven percent. Show how to solve for the **coupon rate** for the bond. Show that it is nine percent. (Hint: As usual, you may assume that the next coupon payment is due in exactly six months.)

2. Cogent Consultants expects to earn \$8.46 per share next year, which, following past practice, it will pay out to shareholders as a cash dividend. The firm's new CEO, however, would like to permanently change policy and pay out only 40% of earnings and retain the remaining 60% for investment in new projects. The CEO believes that the new projects will provide a 20% return, much higher than the firm's 15% cost of capital.
 - a. What is the firm's stock price if it continues paying out all earnings as dividends?
 - b. If the new CEO gets her way, what would happen to Cogent Consultant's stock price?
 - c. Compare the dividends next year under each policy. Why is the smaller dividend associated with a higher stock price?

3. An investment of \$210 produces a perpetual stream of cash inflows. Next year, the cash inflow will be \$10.50 and the cash inflow will grow at 5% per year.
 - a. What is the internal rate of return on this investment?
 - b. At an interest rate of 10%, what is the NPV of this investment?
 - c. What is the Profitability Index (at 10%)

4. A firm is considering the following mutually exclusive projects: Project A requires an initial outlay of \$500 and will return \$120 per year for the next seven years. Project B requires an initial outlay of \$5000, and will return \$1,350 per year for the next five years. The required rate of return is 10%.

- a. Calculate the NPV of this investment
- b. Find the IRR and NPV for the incremental investment (B-A)

5. Dynode expects to sell 5,000 old model scanners next year. Sales will increase to 7,500 the following year, and to 6,000 the third year at which time the line will be discontinued. The current (time zero) price is \$400 per unit while costs are \$150 per unit. Generally, Dynode can increase prices to offset inflation, but competitive pressures will cause a 2% decline in real prices. Unit costs rise with inflation which is expected to be 5%. Incremental depreciation is \$50,000 per year. Dynode's tax rate is 34%.

- a. What is the project's operating cash flows?
- b. If Dynode's real discount rate is 6%, what is the present value of the cash flows in a?

6. Suppose you need to decide between two mutually exclusive machines for a project. When the machine is worn out, it will be replaced. The purchase price and the maintenance costs are:

	0	1	2	3	4
Machine A	-\$350	-100	-60	-50	-100
Machine B	-\$250	-50	-40	-70	

If the cost of capital is 12%, which machine should be purchased?