

ECON 110, Professor Hogendorn

Problem Set 6

1. *Benetton*. Benetton has a stock market capitalization of \$1.2 billion and trades at a price-earnings ratio of 6.5. Hennes & Mauritz, the parent of H&M, trades at a price-earnings ratio of 18.3.
  - (a) What are Benetton's yearly earnings? Does the stock market expect them to rise faster or slower than H&M's?
  - (b) Benetton's costs as a percentage of sales are 54%, while H&M's are 39%. Does this help to explain the difference in price-earnings ratios?
  
2. *UncleKarl*. Your Uncle Karl gives you 20,000 dollars of capital.
  - (a) For \$1000, you can buy a risk-free government bond with a coupon of \$50 (payable at the end of the year), a face value of \$1050, and a maturity of one year. What is the yield on this bond?
  - (b) Alternatively, you can invest some of the capital in a business venture providing downloadable music. For each dollar of capital invested over the course of one year, do you think it is more reasonable to let your cost of that capital be \$0.05, \$0.10, or \$0.15? Discuss your answer with reference to part (a), assuming you can buy fractional amounts of the bonds.
  - (c) To simplify, assume no labor is involved in this business; the only factor is capital. Your production function is  $f(K) = 10K^{9/10}$ , where output is measured in the number of downloads. You must also use \$5,000 more of capital to pay a fixed cost to get started. What are the equations for your

total, average, and marginal cost curves, using your answer to (b)? Graph the AC and MC curves.

- (d) If each download brings you revenue of \$0.04, how much capital should you invest in this business? Show this on your graph. Do you earn a competitive rate of return on your capital, or do you receive rents?

3. *SmallCountry*. Remember that a country's supply of loanable funds is the *net* supply after households that borrow are subtracted from those who save. Suppose there is a small country with 1000 households. 700 of these have a savings function  $S_H(r) = 50r$ , where  $r$  is the rate of return on capital. The remaining 300 households have savings function  $S_L(r) = -1 + 10r$ . (You can imagine that both the number of households and the amount of savings are in thousands.)

- (a) Graph the individual and aggregate savings functions. Describe in words what happens to both types of household and the whole country when the interest rate rises from 3% to 11%.
- (b) There are 100 firms, and each firm has a firm-level investment demand function ( $I_F(r) = 10/r$ ). Find and graph the aggregate investment function for the whole country.
- (c) Show that the equilibrium interest rate in this country is 16.6% (rounded to one decimal).

4. *SpanishBonds*. Suppose the Spanish government sold a bond.

- (a) Suppose each bond has a coupon of €3 and a face value of €100. The first coupon payment is 1 year from now, and the second payment is in 2 years. The bond matures in 2 years. It turns out that today the bond yields 3.46%. What is its price today? Show the full formula before solving.

- (b) If an average US consumer takes out a 3-year loan to pay for a new car, the interest rate they pay is 3.16%. It's strange that the yield on the 2-year Spanish government bonds is higher than that. How can this be?

### Review Problems only, not to turn in:

5. *NetAlone*. Suppose netalone.com is an Internet startup that specializes in e-business consulting. The following table summarizes the company's projected earnings in the next 5 years:

Year	Earnings
2009	100,000
2010	300,000
2011	500,000
2012	700,000
2013	1,000,000

The CEO of netalone.com announced that the company was going to issue 10,000,000 shares of common stock and the IPO (initial public offering) price was set at \$1 per share. (A share of stock entitles you to a share of ownership of the company, and the company's value is based on its earnings.) Suppose the market discount rate is 10%. Based on the above earnings forecast, will you buy the stock? What do you think is a more reasonable price?

6. *Lula*. Suppose there is a Brazilian government bond with a face value of R\$100 (i.e. 100 reals, the currency of Brazil). The bond has a coupon of R\$5 and matures in 1 year.
- (a) If the bond's current price is R\$80, what is its yield?
- (b) Many investors thought that if Lula da Silva were elected president of Brazil, Brazilian debt would become more risky. Explain what probably happened to the price of Brazilian government bonds when Lula won.

## Answers to Review Problems:

### 5. *NetAlone\_a.*

(a)

$$PV = \frac{100000}{1.10} + \frac{300000}{1.10^2} + \frac{500000}{1.10^3} + \frac{700000}{1.10^4} + \frac{1000000}{1.10^5} = 1813531$$

The present value of the earnings per share is thus \$0.18. Paying \$1 per share is too much unless there will be extremely spectacular growth after 2013. A price of \$0.18 per share would be the fair value assuming that earnings beyond 2013 are not counted.

### 6. *Lula.*

(a) The formula to use here is

$$P = \frac{A}{1+i} \quad R\$80 = \frac{R\$5 + R\$100}{1+i} \Rightarrow 1+i = 1.3125 \Rightarrow i = 31.25\%$$

(b) Investors perceived Lula as risky, and they demanded a higher risk premium on Brazilian government bonds. For an existing bond, the coupon and face value have already been set, so the only way for the yield to rise was for the present value to fall, as shown in the formula above.