

Economics 136. Financial Economics

Sample midterm 2A, Fall 2009

Write your name, your GSI's name and your section time on your blue book. You may use a calculator and two double sided sheets of handwritten notes.

1. True or false. (25 points, 5 each)

Are the following statements true or false? Explain your answer in no more than two sentences. You will be graded on the quality of your explanation.

(i) The efficient market hypothesis predicts that the expected return of a call option on Google stock should be the same as the expected return of a put option on Microsoft.

(ii) For a company whose ROE is higher than the discount rate R , it is in shareholders' interest to retain earnings in the company.

(iii) Historically, high dividend-price ratios have predicted low (negative) subsequent price growth and essentially no subsequent change in dividends.

(iv) The average return during 1996-2005 of all mutual funds in existence in 2005 was higher than the return of the S&P500 during the same period. This shows that some fund managers can pick stocks that consistently beat the index.

(v) The variance of the return of a single stock is typically higher than the variance of the return of the S&P500.

2. Stock valuation (25 points, 5 each)

(a) Company ABC is expected to pay dividends $D_1 = \$10$ next year, and has annual dividend growth $G = 5\%$. The discount rate for ABC is $R = 7\%$. What is the current price per share P_0 ? What is the dividend price ratio D_1/P_0 of ABC?

(b) What is the annual growth rate of the stock price of ABC? [You can answer this directly, or by computing P_1 and comparing it to P_0 .] Is it higher or lower than the expected rate of return of ABC? Why?

(c) Company XYZ is expected to pay dividends of \$10 next year, and has zero annual dividend growth. Because XYZ is riskier than ABC, it has a higher discount rate of 8%. What is the current price of XYZ? What is the dividend-price ratio D_1/P_0 for XYZ?

(d) What is the annual growth rate in the stock price of XYZ? What is the annual expected rate of return of XYZ?

(e) In the data, do companies with high or with low dividend-price ratios earn higher returns? Is ABC and XYZ consistent with these data? Do you think the difference in returns between high and low dividend-price ratio stocks is necessarily a violation of the efficient markets hypothesis?

3. CAL and portfolio choice (25 points, 5 each)

Note: use natural units in your solution (e.g., a standard deviation of 20% means $\sigma = 0.2$ and $\sigma^2 = 0.2^2 = 0.04$).

You are a financial advisor who works with two asset classes: stocks and a riskfree asset (e.g., T-bills). The expected return of stocks is 12%, and the standard deviation is 20%. The riskfree return is 4%. You are advising a risk-averse client who has mean-variance preferences.

(a) Draw the capital allocation line.

(b) Your client's current portfolio has an expected return of 8% and standard deviation of 13%. Indicate this portfolio in your figure. Can you recommend a portfolio that your client will prefer to her current portfolio? Which one? Why?

(c) Suppose your client wants to invest 125% of her wealth in stocks and -25% in the riskfree asset. Show this portfolio in your figure. What is its expected return and standard deviation?

(d) Now suppose that your client has a risk aversion coefficient of $A = 8$. What is the share of stocks in her optimal portfolio? What is the expected return and standard deviation of the portfolio return? Show this portfolio in the figure.

(e) Suppose that the riskfree *borrowing rate* is 6%, so that if you want to borrow you have to pay 6%; in contrast, the riskfree *lending rate* continues to be 4%. How does CAL change? What is now the expected return and standard deviation of the portfolio in (c)? Where is this portfolio in the diagram now?

4. Efficient markets (25 points, 5 each)

Company XYZ will pay dividends of \$20 next year (at $t = 1$). After $t = 1$, the dividends of the company will either grow at a high annual rate of $G^h = 6\%$ or at a lower rate of $G^l = 4\%$ (forever). The company will announce just before $t = 1$ whether subsequent growth will be high or low. At $t = 0$ we only know that the probability of high growth is 50% (and the probability of low growth is also 50%). The discount rate is $R = 8\%$.

(a) What is P_1 , the price of the company at $t = 1$ if dividend growth is high? What is P_1 if dividend growth is low? [P_1 is the stock price after dividends for $t = 1$ have already been paid, so you can ignore them in this calculation.]

(b) What is EP_1 , the expected value of P_1 from the perspective of $t = 0$? What is ED_1 , the expected value of D_1 (dividends in year 1) from the perspective of $t = 0$? Compute P_0 , the price of a share at $t = 0$, as the discounted value of $EP_1 + ED_1$.

(c) Consider an investor who buys one share of the company at $t = 0$ and holds it for one period. What is the actual, realized rate of return the investor earns between $t = 0$ and $t = 1$ if growth turns out to be high? If growth turns out to be low?

(d) Define the abnormal return between period 0 and 1 as the difference between the actual rate of return you computed in part (c) and the discount rate R . What is the expected abnormal return? Is this consistent with the efficient markets hypothesis?

(e) Comment on the following argument in no more than two sentences: “The stock market is clearly inefficient. Company XYZ recently announced that it is expected to grow at a positive rate $G = 4\%$, and yet the stock price fell. Investors must be crazy.”