

1. Exercises 3 through 6 from page 359 of the textbook.

Exercise 3:

In this case, you can diversify risk fully. Note that if you buy one unit of each kind of asset, your returns are €150 in each state of the world, thus you have no risk.

Exercise 4:

Each asset has an expected return that is the simple average of the three possible outcomes (since all have equal probability). In each case, this is €50. With an expected return of €50, the risk premium would be €1 and the price of the assets would be €49. It is worth noting that because there is no non-diversifiable risk in this case, there probably should be no risk premium.

Exercise 5:

It is possible, but unlikely, that the risk premium on longer-term could be negative. A more plausible explanation is that the expected future short-term rate is lower than the current short-term rate, so that the average expected rate on a sequence of short-term bonds is lower than the rate on the corresponding long-term bond.

Exercise 6:

The decline in expected future profits will lower expected dividends and reduce share prices. The central bank can counter this to some degree by lowering the interest rate, which reduces the discount factor applied to future profits and props up the share price. The greater the pessimism, the larger is the reduction in the interest rate needed to keep share prices up. (The central bank might worry about share prices because they affect investment and thus aggregate demand through q .)

2. The current interest rate on a 3-month Treasury bill is 0.0634% and the current rate on a six-month bill is 0.1564%. If you assume that there is no risk or liquidity premium, you can calculate the expected return on some future Treasury bill. What are the exact characteristics of that asset (date of issue, term to maturity) and what is its expected rate of return?

The asset whose expected return you can calculate is the 3-month Treasury bill issued 3 months from today (and maturing 6 months from today). Using the simpler, approximate formula, the longer rate is equal to the average of the two shorter rates covering the same period, plus the risk premium which we have assumed away in this problem. Thus, $0.1564\% = (0.0634\% + i_2)/2$, and the expected future rate $i_2 = 0.2494\%$. Still pretty low!

3. Some stocks promise high dividend payments and others promise none.

a. Why do firms choose not to pay dividends?

If capital markets are imperfect (which they are), then it may be cheaper for firms to fund their investment projects internally rather than borrowing (from banks or by issuing bonds) or through issuance of new stock. If nothing else, this will save on transaction costs and, if information about the firm is highly imperfect, it may eliminate a large risk premium. Note that this result differs from the Modigliani-Miller Theorem, which says that *with perfect capital markets* firms are indifferent to how investment projects are financed.

b. What kind of firms are likely to make that choice?

Internal finance is probably most tempting for firms for whom information and transaction costs are high—those that face the greatest capital-market imperfections. These would be young and small firms that would have trouble raising money directly from capital markets.

c. Why are people willing to hold stocks that do not pay dividends?

As long as people believe that the future price of the stock will be higher than today's price, they will be willing to hold stocks with zero dividend yield. The higher expected future price could be justified by the expectation of higher future profits (i.e., that the company is likely to use the retained funds profitably) that will allow dividends to be paid at some future date. (It could also be a bubble...)

d. Is it plausible that these stocks will never, ever pay dividends to shareholders?

No. If they were known never to pay dividends, then the only situation in which a rational investor would hold them would be a bubble, which really isn't very rational.

4. The "price/earnings ratio" or P/E is a common metric for evaluating stocks. It is the ratio of the current share price to current annual earnings.

a. What economic forces would tend to equalize P/E ratios across firms in an efficient market?

If all firms paid out all profits as dividends, then the dividend yield would be the reciprocal of the P/E ratio. Two otherwise identical stocks (i.e., same expected capital gain) should have the same dividend yield, hence the same P/E ratio in equilibrium.

b. Why wouldn't you expect all P/E ratios to be exactly the same?

The P/E ratio depends on current earnings; the price of the stock is based on current and expected future earnings. A stock with low (or negative) current earnings but highly promising prospects for the future might command a higher market price than one with high current earnings but relatively dismal growth prospects.

c. What kinds of firms would you expect to have high or low P/E ratios at any moment in time?

Young and growing firms with bright futures would have higher P/E ratios than mature firms. Of course, the P/E ratio of a firm with negative earnings is formally negative, but is usually thought of as being infinitely large (as if the firm had zero earnings but positive share price).

5. If you believe that interest rates are likely to rise in the future, what do you expect will happen to the prices of existing long-term bonds? Does this make bonds an attractive or unattractive investment choice? If everyone shares this opinion, will they tend to move their money into or out of bonds? How will this affect bond prices and the expected rate of return on bonds? How will this affect the prices of alternative assets such as stocks? Given this change in the value of stocks (assuming there is no change in the expected future profits of the firms), how will this affect the rate of return on stocks? How will equilibrium between the returns on stocks and bonds be restored?

If interest rates rise, bond prices will fall, which makes bonds an unattractive asset. If everyone believed this, they would sell bonds, which would *immediately* lower their price and raise interest rates. Thus, broadly shared expectations of future increases in interest rates tend to be self-fulfilling. The rise in the interest rate will, other things being equal, lower the fundamental value of stocks and their prices, which will raise the expected rate of return on them given their unchanged expected earnings and dividends. Equilibrium is restored when the (risk-adjusted) expected return on stocks rises to match the interest rate on bonds.