

Solution to Problem Set 7

1. BM, Problem 1, Chapter 13 (p. 349)

- (a) An individual can do crazy things, but still not affect the efficiency of the markets. The price in an efficient market is a consensus price as well as a marginal price. An 'irrational' person can affect an efficient market price only as long as that person has enough money to do so, and afterward the price will adjust back to its efficient price (assuming that there is no new relevant information revealed by that person's actions).
- (b) How many people have made a bundle only to lose it later? People can be lucky; efficient markets do not preclude this possibility.
- (c) Is there a way to make superior profits from investor psychology? Almost no one can tell beforehand how 'investor psychology' will affect prices. In general, investor psychology is a slippery concept, often invoked to provide easy explanations for certain types of price movements that can arise from very complex market interactions.
- (d) The book value, while certainly stable, is not a value at which one can buy or sell when new information makes the value obsolete. It is the price at which you can buy or sell today that determines value.

2. BM, Problem 12, Chapter 13 (p. 350)

The efficient markets hypothesis does not imply that portfolio selection should be done with a pin. The manager still has three important jobs to do. First, the manager must make sure that the portfolio is well-diversified. Second, the manager must make sure that the risk of the diversified portfolio is appropriate for the manager's clients. Third, the manager might want to tailor the portfolio to take advantage of special tax laws. These laws may make it possible to increase the expected return on the portfolio with increasing risk.

3. BM, Problem 13, Chapter 13 (p. 350)

Used car dealers do not have all relevant information about a car which they are about to purchase; the current owner, who for some reason wants to sell the car, is better informed about its condition. The used car dealer, to make up for the "lemons" he or she unwittingly buys, has to have a large spread between the buying and selling prices.

The bond broker does not usually have to worry about buying a bond for too high a price from a seller with inside information. Whether the broker knows everything about the particular bond usually makes no difference. The market has the information, and that information is reflected in the price. Therefore, the cost of “lemons” is a relatively small part of the broker’s spread.

4. (b) and (c) are correct
5. We will use the formula

$$r = \frac{D}{V}r_D + \frac{E}{V}r_E.$$

We know that $D/V = 1/3$ and $E/V = 2/3$. To compute the discount rate for debt, we use the information on the company’s bonds. The cash flow of the bonds is \$4.5 six months from now, one year from now, etc, until 3 years from now, and \$104.5, 3.5 years from now. Using the fact that the price is \$97, we get a YTM of 10.04%. This is a semiannually compounded APR. The EAR is 10.29%. To compute the discount rate for equity, we use the CAPM. The discount rate is

$$r = R_f + \beta(E(R_m) - R_f) = 5\% + 1.30 \times 7\% = 14.1\%.$$

Combining, we get a discount rate of 12.83%.

6. BM, Problem 6, Chapter 9 (p. 233)

(a) The beta of the firm’s assets is

$$\beta_{\text{asset}} = \frac{0 \times 100 + 0.2 \times 40 + 1.2 \times 200}{100 + 40 + 200} = 0.73$$

- (b) A change in the capital structure does not affect the risk of the assets, so β_{asset} will remain the same.
- (c) Using the Security Market Line,

$$r_{\text{asset}} = r_f + \beta_{\text{asset}}(r_m - r_f)$$

and assuming $r_f = 5\%$ and $r_m - r_f = 6\%$,

$$r_{\text{asset}} = 5\% + 0.73 \times 6\% = 9.38\%.$$