What to do with this practice set?

To help MBA students prepare for the assignment and the exams, practice sets with solutions will be handed out. These sets contain select worked-out end-of-chapter problems from BKM4 through BKM6. These sets will not be graded, but students are strongly encouraged to try hard to solve them and to use office hours to discuss any problems they may have doing so. One of the best self-tests for a student of his or her command of the material before a case or the exam is whether he or she can handle the questions of the relevant practice sets. The questions on the exam will cover the reading material, and will be very similar to those in the practice sets.

Question 1.

Suppose you discover a treasure chest of $10 billion in cash.

(a) Is this a real or financial asset?
(b) Is society any richer for the discovery?
(c) Are you wealthier?
(d) Can you reconcile your answers to (b) and (c)? Is anyone worse off as a result of the discovery?

Question 2.

Consider Fig. 1.5 in BKM6.

(a) Are these American gold certificates primitive or derivative securities?
(b) Is the issue being described a primary or secondary market transaction?

Question 3.

Suppose that you are an executive of General Motors (GM), and that a large share of your potential income is derived from year-end bonuses that depend on GM’s annual profits.

(c) Would the purchase of GM stock be an effective hedging strategy if you were worried about the uncertainty surrounding your bonus?
(d) Would the purchase of Toyota stock be an effective hedging strategy?
(e) What would be another better hedging strategy, if any?

Question 4.

What would you expect to happen to the spread between yields on commercial paper and Treasury bills if the economy were to enter a steep recession?
**Question 5.**

A bill has a bank discount yield of 6.81% based upon the asked price, and 6.90% based upon the bid price. The maturity of the bill (already accounting for skip-day settlement) is 60 days.

(a) Find the bid and asked prices of the bill.
(b) Calculate the bond equivalent yield of the bill as well as its effective annual yield based upon the asked price. Confirm that these yields exceed the discount yield.

**Question 6.**

Which of the following two securities offers a higher effective annual yield?

(a) Security X is a 3-month bill selling at $9,764; security Y is a 6-month bill selling at $9,539.
(b) Suppose there are 90 or 180 days in the relevant periods. Calculate the bank discount yield on each bill.

**Question 7.**

Find the after-tax return to a corporation that buys a share of preferred stock at $40, sells it at year-end at $40, and receives a $4 year-end dividend. The firm is in the 40% tax bracket.

(Hint: recall the 70% exemption on dividend income for corporate dividend payees)

**Question 8.**

An investor is in the 28% tax bracket. If corporate bonds happen to offer 9% yields, what must tax-free munis (municipal bonds) yield for the investor to prefer them to corporate bonds?

**Question 9.**

FBN Inc. has just sold 100,000 shares in an initial public offering. The underwriter’s explicit fees were $70,000. The offering price for the shares was $50, but immediately upon issue the share price jumped to $53.

(a) What is your best guess as to the total cost to FBN of the equity issue?
(b) Is the entire cost of the underwriting a source of profit to the underwriters?
Question 10.

Suppose that you sell short 100 shares of IBM, now selling at $70 per share.

(a) What is your maximum possible loss?
(b) What happens to the maximum loss if you simultaneously place a stop-buy order at $78?

Question 11.

The table below provides some price information on Marriott:

<table>
<thead>
<tr>
<th>Bid Price</th>
<th>Asked Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marriott</td>
<td>37.25</td>
</tr>
<tr>
<td></td>
<td>38.13</td>
</tr>
</tbody>
</table>

You have placed a stop-loss order to sell at $38. By placing this order, what are you in effect asking your broker to do? Given the market prices, will your order be executed?

Question 12.

Consider the following limit-order book of a specialist. The last trade in the stock took place at a price of $50.

<table>
<thead>
<tr>
<th>Limit-buy Orders</th>
<th>Limit-sell Orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price ($) Shares</td>
<td>Price ($) Shares</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>49.75  500</td>
<td>50.25  100</td>
</tr>
<tr>
<td>49.50  800</td>
<td>51.50  100</td>
</tr>
<tr>
<td>49.25  500</td>
<td>54.75  300</td>
</tr>
<tr>
<td>49.00  200</td>
<td>58.25  100</td>
</tr>
<tr>
<td>48.50  600</td>
<td></td>
</tr>
</tbody>
</table>

(a) If a market-buy order for a round lot (100 shares) comes in, at what price will it be filled?
(b) At what price would the next market-buy order be filled?
(c) You are the specialist: do you wish to increase or decrease your inventory of this stock?

Question 13.

You have borrowed $20,000 on margin to buy shares in Disney, which is now selling at $80 per share. Your account starts at the initial margin requirement of 50%. The maintenance margin is 35%. Two days later, the stock price falls to $75 per share.

(a) Will you receive a margin call?
(b) How low can the price of Disney shares fall before you receive a margin call?
Practice Set #1: Solutions.

Question 1:
(a) Cash is essentially a financial asset because it is the liability of the government. Financial assets do not represent a society’s wealth.
(b) No. The cash does not directly contribute to the productive capacity of the economy.
(c) Yes. Financial assets might contribute to the wealth of the individuals or firms holding them.
(d) Yes. Taxpayers as a group will make up for the government liability.

Question 2.
These are primary-market transactions that entail the offer for first sale of derivative instruments. The underlying primitive instrument is the gold, whose value determines the value of these certificates.

Question 3:
(a) No. Diversification makes sense if you expect to invest your savings in assets that do well when GM is doing poorly.
(b) No. Although Toyota is a competitor of GM, both companies are subject to fluctuations in the automobile market. Thus, while this strategy is somewhat superior to (a), it is not very good as a hedge.
(c) Buying put option on GM stock, if legal, would be a better solution.

Question 4:
Commercial paper is subject to default risk, whereas US T-bills are not. The spread between yields on commercial paper and T-bills would therefore be expected to widen, insofar as a deterioration in the economy increases credit risk, that is, the likelihood of default. Investors will demand a greater premium on bonds subject to default risk.
**Question 5:**

(a) \( P = 10,000 \left[1 - r_{BD} \left(\frac{n}{360}\right)\right] \), where \( r_{BD} \) stands for the discount yield. Thus,

\[ P_{\text{ask}} = 10,000 \left[1 - 0.0681 \left(\frac{60}{360}\right)\right] = $9,886.50 \]

\[ P_{\text{bid}} = 10,000 \left[1 - 0.0690 \left(\frac{60}{360}\right)\right] = $9,885.00 \]

(b) \( r_{BEY} = \left[\frac{(10,000 - P)/P}{365/n}\right] \). Thus,

\[ r_{BEY} = \frac{(10,000 - 9,886.5)/9,886.5}{365/60} = 6.98\%, \text{ which exceeds the discount yield of } 6.81\%. \]

In order to obtain the effective annual yield, \( r_{EAY} \), you should note that the 60-day growth factor for invested funds is \( \frac{10,000}{9,886.50} = 1.01148 \). Annualizing this growth rate will result in:

\[ (1 + r_{EAY}) = \left(1.01148\right)^{\left(\frac{365}{60}\right)} = 1.0719, \text{ which in turns gives } r_{EAY} = 7.19\%. \]

**Question 6:**

(a) Since I did not give the exact number of days involved, a good approximation of the annualization factors is 4 for the first bond (there are four 3-month periods in a year) and 2 for the second bond (there are two 6-month periods in a year). With this approximation, Security X offers an effective annual yield of \( 10.02\% = \left(\frac{10,000}{9,764}\right)^4 - 1 \), while security Y offers an effective annual yield of \( 9.9\% = \left(\frac{10,000}{9,539}\right)^2 - 1 \). Thus, the three-month bill offers a higher effective annual yield.

(b) Suppose there are 90 days in the given period. Then, the \( r_{BD} \) for security X is of 9.44\% while the \( r_{BD} \) for security Y is of 9.22\%.

**Question 7:**

The holding period return will be the sum of the capital gains return and the dividend or interest income return: \( R = \frac{\left(P_1-P_0+D\right)}{P_0} - 1 \).

There is no capital gain, since the sale price \( (P_1) \) is the same as the purchase price \( (P_0=$40) \). The total return before-tax income is therefore the 4\% dividend of $4, of which 0.3 x $4 = $1.2 is taxable income (after the 70\% exclusion). Taxes therefore are equivalent to $0.48, for an after-tax income of $3.52 = $2.80 (tax-free) + $0.72 (after tax) and a rate of return of \( 8.8\% = \left(\frac{43.52}{$40}\right)-1 \).

**Question 8:**

The after-tax yield on the corporate bonds is given by: \( 0.09(1 - 0.28) = 0.0648 \). Therefore, municipals must pay at least 6.48\% for investors to consider buying them.

**Question 9:**

(a) In addition to the explicit fees of $70,000, FBN appears to have paid an implicit price in underpricing of the initial public offering (IPO). The underpricing is $3/share or $300,000 total, which implies total costs of $370,000.
(b) No. The underwriters do not capture the part of the costs corresponding to the underpricing. The underpricing may be a rational marketing strategy. Without it, the underwriters would need to spend more resources to place the issue with the public. They would then need to charge higher explicit fees to the issuing firm. The issuing firm may be just as well off paying the implicit issuance cost represented by the underpricing.

**Question 10:**

(a) In principle, potential losses are unbounded, growing directly with increases in the price of IBM.

(b) If the stop-buy order can be filled at $78, the maximum possible loss per share is $8. If IBM shares go above $78, the stop-buy order is executed, limiting the losses from the short sale.
**Question 11:**

You are asking the broker to try to sell Marriott as soon as the stock is being sold at bid price of $38 or less. Here, the broker will attempt to immediately execute your order, but he may not be able to get $38 -- since the bid price is now 37 ¼.

**Question 12:**

(a) The buy order will be filled at the best limit-sell order of $50.25.
(b) At the next-best price of $51.50.
(c) You should increase your position. There is considerable buy pressure at prices just below $50, meaning that downside risk is limited. In contrast, sell pressure is sparse, meaning that a moderate buy order could result in a substantial price increase.

**Question 13:**

(a) You will not receive a margin call. You borrowed $20,000 and with another $20,000 of your own equity, you bought 500 shares of Disney at $80 a share for a total investment of $40,000. At $75 a share, the market value of the account is $37,500, your equity is $17,500, and the percentage margin is 47%, which is above the required percentage maintenance margin of 35%.
(b) A margin call will be issued when:

\[
\text{Margin} = \frac{(500P - 20,000)}{500P} = 0.35, \text{ that is when } P = \$61.54.
\]