Cost of Capital, Capital Structure, and Dividend Policy

1. A relatively young firm has capital components valued at book and market and market component costs as follows. No new securities have been issued since the firm was originally capitalized.

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<th>Book</th>
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<tr>
<td>Debt</td>
<td>$42,830</td>
<td>$40,000</td>
<td>8.5%</td>
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<td>Preferred Stock</td>
<td>$10,650</td>
<td>$10,000</td>
<td>10.6%</td>
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<td>Common Equity</td>
<td>$65,740</td>
<td>$32,000</td>
<td>25.3%</td>
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Calculate the firm's capital structures and WACCs based on both book and market values, and compare the two. What appears to have happened to interest rates since the company was started? Does the firm seem to be successful?

- a. Interest rates have gone up; the firm is not successful.
- b. Interest rates have gone down; the firm is successful.

2. The Pepperpot Company's stock is selling for $52. Its last dividend was $4.50, and the firm is expected to grow at 7% indefinitely. Flotation costs associated with the sale of common stock are 10% of the proceeds raised. Estimate Pepperpot's cost of retained earnings.

- a. 12.5%
- b. 14.3%
- c. 16.3%
- d. 17.5%

3. The Pepperpot Company's stock is selling for $52. Its last dividend was $4.50, and the firm is expected to grow at 7% indefinitely. Flotation costs associated with the sale of common stock are 10% of the proceeds raised. Estimate Pepperpot's cost of equity from the sale of new stock.

- a. 16.3%
- b. 17.3%
- c. 14.2%
- d. 12.1%

4. Randal Flapjack is a retired short-order cook living on a fixed income in the state of Utopia where all financial markets are perfectly efficient. Randal has 20,000 shares of the Sugarcooky Corp., which pays an annualized dividend of $1.00 per share. Sugarcooky sells at a P/E of 10, has maintained a payout ratio of 50% for many years, and has not grown in some time. Management has recently announced that it will reduce Sugarcooky's payout ratio to 25% but expects earnings to grow at 5% from now on. What is Sugarcooky's current price?

- a. $10
- b. $50
- c. $20
- d. $1.50
5. Randal Flapjack is a retired short-order cook living on a fixed income in the state of Utopia where all financial markets are perfectly efficient. Randal has 20,000 shares of the Sugarcooky Corp., which pays an annualized dividend of $1.00 per share. Sugarcooky sells at a P/E of 10, has maintained a payout ratio of 50% for many years, and has not grown in some time. Management has recently announced that it will reduce Sugarcooky's payout ratio to 25% but expects earnings to grow at 5% from now on. How much current income is Randal losing as a result of management's action?

   a. $20,000
   b. $10,000
   c. $5,000
   d. $1,000

6. Randal Flapjack is a retired short-order cook living on a fixed income in the state of Utopia where all financial markets are perfectly efficient. Randal has 20,000 shares of the Sugarcooky Corp., which pays an annualized dividend of $1.00 per share. Sugarcooky sells at a P/E of 10, has maintained a payout ratio of 50% for many years, and has not grown in some time. Management has recently announced that it will reduce Sugarcooky's payout ratio to 25% but expects earnings to grow at 5% from now on. If Randal keeps his money in Sugarcooky but needs to maintain his current income, how many shares will he have to sell in the first year?

   a. 10
   b. 50
   c. 200
   d. 500

7. Randal Flapjack is a retired short-order cook living on a fixed income in the state of Utopia where all financial markets are perfectly efficient. Randal has 20,000 shares of the Sugarcooky Corp., which pays an annualized dividend of $1.00 per share. Sugarcooky sells at a P/E of 10, has maintained a payout ratio of 50% for many years, and has not grown in some time. Management has recently announced that it will reduce Sugarcooky's payout ratio to 25% but expects earnings to grow at 5% from now on. What will be the value of his remaining shares (assuming that he sells off shares to maintain his current income) at the end of a year if the P/E remains the same? Is his investment growing?

   a. $20,000
   b. $11,500
   c. $9,500
   d. $5,000
8. The Addington Book Company has the following equity position. The stock is currently selling for $3 per share.

Common Stock (8 million shares outstanding, $2 par) $16,000,000
Paid in Excess 4,000,000
Retained Earnings 12,000,000
Total Common Equity $32,000,000
Book Value per share $4.00

What was the average price at which the company originally sold its stock? Reconstruct the equity statement above to reflect a four-for-one stock split.

- a. $1.75
- b. $2.00
- c. $2.50
- d. $2.75

9. The Alligator Lock Company is planning a two-for-one stock split. You own 5,000 shares of Alligator's common stock that is currently selling for $120 a share. What is the value of your Alligator stock now, and what will it be after the split? Alligator's CFO says that the value of the shares will decline less than proportionately with the split because the stock is now out of its trading range. If the decline is 45%, how much will the split make you?

- a. $600,000 now; $600,000 after; $60,000 gain
- b. $600,000 now; $750,000 after; $60,000 gain
- c. $600,000 now; $600,000 after; $10,000 gain
- d. $500,000 now; $500,000 after; $60,000 gain

10. Husky Enterprises recently sold an issue of 10-year maturity bonds. The bonds were sold at a deep discount price of $615 each. After flotation costs, Husky received $604.50 each. The bonds have a $1,000 maturity value and pay $50 interest at the end of each year. Compute the after-tax cost of debt for these bonds if Husky's marginal tax rate is 40 percent.

- a. 3.2%
- b. .6%
- c. 7.2%
- d. 12%

11. Calculate the after-tax cost of preferred stock for Bozeman-Western Airlines, Inc., which is planning to sell $10 million of $6.50 cumulative preferred stock to the public at a price of $50 a share. Issuance costs are estimated to be $2 a share. The company has a marginal tax rate of 40%.

- a. 15%
- b. 13.54%
- c. 12.74%
- d. 11.15%
12. The Hartley Hotel Corporation is planning a major expansion. Hartley is financed 100 percent with equity and intends to maintain this capital structure after the expansion. Hartley's beta is 0.9. The expected market return is 16% and the risk-free rate is 10%. If the expansion is expected to produce an internal rate of return of 17%, should Hartley make the investment?

- a. Hartley should make the investment.
- b. Hartley should not make the investment.

13. Globe Steel has decided to diversify into the home improvement field. As a result of this expansion, Globe's beta value drops from 1.3 to 0.9, and the expected future long-term growth rate in the firm's dividends drops from 8 to 7%. The expected market return is 14%; the risk-free rate is 7%, and the current dividends per share, \(D_0\), are $3. Should Globe undertake the planned diversification?

- a. Globe should diversify.
- b. Globe should not diversify.

14. Jersey Computer Company has estimated the costs of debt and equity capital (with bankruptcy and agency costs) for various proportions of debt in its capital structure:

<table>
<thead>
<tr>
<th>Proportion of Debt</th>
<th>Cost of Debt, (k_d (1-T))</th>
<th>Cost of Equity, (k_c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>-</td>
<td>12.0%</td>
</tr>
<tr>
<td>0.10</td>
<td>4.7%</td>
<td>12.1</td>
</tr>
<tr>
<td>1.20</td>
<td>4.9</td>
<td>12.5</td>
</tr>
<tr>
<td>0.30</td>
<td>5.1</td>
<td>13.0</td>
</tr>
<tr>
<td>0.40</td>
<td>5.5</td>
<td>13.9</td>
</tr>
<tr>
<td>0.50</td>
<td>6.1</td>
<td>15.0</td>
</tr>
<tr>
<td>0.60</td>
<td>7.5</td>
<td>17.0</td>
</tr>
</tbody>
</table>

Determine the firm's optimal capital structure. Suppose that the firm's current capital structure consists of 30% debt (and 70% equity). Determine how much higher its weighted average cost of capital is than at the optimal capital structure.

- a. Optimal: 40% debt, 60% equity
- b. Optimal: 25% debt, 75% equity
- c. Optimal: 45% debt, 55% equity
- d. Optimal: 35% debt, 65% equity

15. Jacobs Corporation earned $2 million after taxes. The firm has 1.6 million shares of common stock outstanding. Compute the earnings per share of Jacobs. If Jacobs' dividend policy calls for a 40% payout ratio, what are the dividends per share?

- a. EPS = $1.60; DPS = $0.40
- b. EPS = $1.40; DPS = $0.50
- c. EPS = $1.25; DPS = $0.50
- d. EPS = $1.10; DPS = $0.60
16. Wolverine Corporation plans to pay a $3 dividend per share on each of its 300,000 shares next year. Wolverine anticipates earnings of $6.25 per share over the year. If the company has a capital budget requiring an investment of $4 million over the year and it desires to maintain its present debt to total assets (debt ratio) of 0.40, how much external equity must it raise? Assume Wolverine's capital structure includes only common equity and debt, and that debt and equity will be the only sources of funds to finance capital projects over the year.

a. $975,000  
b. $1,275,000  
c. $2,400,000  
d. $1,425,000

17. Clynne Resources expects earnings this year to be $2 per share, and plans to pay a dividend of $0.70 for the year. During the year Clynne expects to borrow $10 million in addition to its already outstanding loan balances. Clynne has 10 million shares of common stock outstanding. If all capital outlays are funded from retained earnings and new borrowings and if Clynne follows a residual dividend policy, what capital outlays are planned for the coming year?

a. $1,300,000  
b. $13,000,000  
c. $23,000,000  
d. $27,000,000

18. Sealight, Incorporated has just negotiated a 5-year term loan of $8,000,000. The loan is fully amortized at an annual rate of interest of 12%. What are the required annual payments?

a. $3,600,000  
b. $2,115,000  
c. $2,000,140  
d. $2,219,263

19. A zero coupon bond with a $1,000 par value and a maturity of 8 years has a yield-to-maturity of 12%. What is the current price? If the yield-to-maturity remains constant, what will be the bond's price 7 years before maturity? One year before maturity?

a. $404; $452; $89  
b. $440; $452; $893  
c. $304; $402; $883  
d. $414; $452; $893
20. As an alternative to zero coupon bonds, Pacific Oil is considering the issuance of "deep discount" bonds. The bonds would have a 10-year maturity, $1,000 par value, and a 6% coupon rate even though the yield-to-maturity is expected to be 14%. Interest is paid annually. What is the expected price of each bond? In order to raise the needed $400,000,000, how large must the principal of the bond issue be?
   a. Bond price, $582.96; principal, $582,961,420
   b. Bond price, $258.96; principal, $682,961,420
   c. Bond price, $582.96; principal, $686,153,420
   d. Bond price, $592.96; principal, $686,961,420

21. Diebold Pulp and Paper has decided to raise FF20,000,000 through a subscription of common stock. It has 2,000,000 shares of common stock currently outstanding that sell for FF120 per share. It has decided to set the subscription price at FF100 per share. How many shares must be issued to raise the desired amount of funds?
   a. 225,000
   b. 250,000
   c. 200,000
   d. 20,000

22. Ohio Plastics has the following net worth on its balance sheet

Common Stock ($1.50 per value) $3,300,000
Contributed Capital In Excess-of-Par 25,400,000
Net Worth $28,700,000

How many shares outstanding does the firm have?
What is the average price per share?
   a. 1,200,000; $13.05
   b. 2,250,000; $13.25
   c. 2,200,000; $13.05
   d. 2,200,000; $13.75
23. Missouri Valley Industries, Inc. has 2,000,000 shares of common stock outstanding and total equity as given below:

<table>
<thead>
<tr>
<th>Preferred Stock ($100 par value)</th>
<th>$2,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Stock ($1.00 par value)</td>
<td>2,000,000</td>
</tr>
<tr>
<td>Capital Surplus</td>
<td>6,000,000</td>
</tr>
<tr>
<td>Retained Earnings</td>
<td>10,000,000</td>
</tr>
<tr>
<td>Total Equity</td>
<td>$20,000,000</td>
</tr>
</tbody>
</table>

Calculate the book value per share of its common stock. Assuming that all 2,000,000 shares of common stock were sold at the same time, what was the price per share at the time of issue?

a. $18; $9  
b. $9; $4.50  
c. $9; $4  
d. $12; $9

24. Find the conversion price for a convertible $1,000 bond with a conversion ratio of 15. The market price of the common stock is $47.00 per share.

a. $470  
b. $705  
c. $740  
d. $750

25. Find the conversion price of a convertible $1,000 bond, convertible into common stock at $20.00 per share. The market price of the common stock is $18.00 per share.

a. $1,800  
b. $800  
c. $900  
d. $180

26. A firm has a capital structure that is half debt and half common equity and totals $120,000,000. Sales are $180,000,000 with variable costs equal to 60% of sales and fixed operating costs of $30,000,000. It has 2,500,000 shares of common stock outstanding and interest on debt is 12%. If the corporate tax rate is 40%, find the EBIT, NI, BEP, ROE, and EPS.

a. $42,000,000; $20,880,000; 35%; 34.8%; $8.35  
b. $72,000,000; $34,880,000; 35%; 34.8%; $8.35  
c. $42,000,000; $20,880,000; 25%; 33.8%; $8.35  
d. $42,500,000; $20,880,000; 35%; 34.8%; $10.35
27. Winston Products' total assets equal £75,000,000. Its EPS and ROE are unaffected by changes in financial leverage. Given that its cost of debt is 8%, find Winston's EBIT.

a. £800,000
b. £600,000
c. £6,000,000
d. £7,000,000

28. The management of ACM Corporation is evaluating a change in the capital structure of the firm to benefit from the effects of financial leverage. The firm currently has assets of $10,000,000 financed entirely with 200,000 shares of common stock selling at $50 per share. The firm would alter its capital structure by borrowing funds at an interest rate of 12% and repurchasing shares at $50 per share. Management expects the firm to earn $1,500,000 next year before interest and taxes. The firm's tax rate is 50%. What is the expected earnings per share (EPS) and return on equity (ROE) at next year's expected level of EBIT if the firm remains 100% equity financed?

a. EPS, $75; ROE, 15%
b. EPS, $37.50; ROE, 7.5%
c. EPS, $3.75; ROE, 7.5%
d. EPS, $7.50; ROE, 15%

29. Standex Products has estimated that its after-tax cost of debt is 6% and its cost of common equity is 16%. Standex expects to continue a policy of borrowing 30% of its needed capital with the remainder provided by common equity. Calculate its weighted average cost of capital.

a. 16%
b. 14%
c. 13%
d. 12%

30. Ametek Shipping's last annual dividend was DM2.50 per share. Its common stock is selling for DM36.00 per share. If analysts are projecting 11% growth in earnings and dividends for the foreseeable future, what is Ametek Shipping's cost of common equity?

a. 7.7%
b. 11%
c. 1.87%
d. 18.7%
31. Because it has no plans for reinvestment, Barnes Corporation is expected to continue paying out 100% of its earnings as a dividend. EBIT is expected to be $1,000,000 per year indefinitely. There is no debt in Barnes capital structure, it has 100,000 shares of common stock outstanding, and the corporate tax rate is 40%. The next dividend is one year from now. The required rate of return on equity is 10%. Calculate the dividend per share each year, the current market price for Barnes' stock, and the market price of the stock one year from now.

   a. $6; $60; $60
   b. $4; $60; $60
   c. $6; $50; $60
   d. $5; $50; $60

32. Rikon KK has 3,000,000 shares of stock outstanding selling for ¥4500 per share. The board has just declared a 20% stock dividend. If all other factors affecting the stock's price remain unchanged, calculate the market price per share after the stock dividend, and the total value of all shares of stock - before and after the dividend - held by an investor who owned 100 shares prior to the dividend.

   a. After dividend, ¥3,750; all shares before, ¥135,000; all shares after, ¥375,000
   b. After dividend, ¥3,600; all shares before, ¥250,000; all shares after, ¥375,000
   c. After dividend, ¥4,500; all shares before, ¥375,000; all shares after, ¥450,000
   d. After dividend, ¥3,750; all shares before, ¥450,000; all shares after, ¥450,000
1. A relatively young firm has capital components valued at book and market and market component costs as follows. No new securities have been issued since the firm was originally capitalized.

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Calculate the firm's capital structures and WACCs based on both book and market values, and compare the two. What appears to have happened to interest rates since the company was started? Does the firm seem to be successful?

a. Interest rates have gone up; the firm is not successful.
b. **Interest rates have gone down; the firm is successful.**

**ANSWER:** b

**SOLUTION:**

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<td>4.15</td>
</tr>
<tr>
<td>Preferred Stock</td>
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<td>1.29</td>
</tr>
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<td>13.94</td>
<td>9.87</td>
</tr>
<tr>
<td>$119,220</td>
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Use WACCs = 17.9% 15.3%

Comparison: The overall cost of capital has risen due to the net impact of a large increase in the value of the firm's equity. This throws more of equity's high cost into the WACC. Interest rates appear to have fallen, since the market values of debt and preferred exceed their original values.

The firm seems to be successful because of the substantial increase in the value of equity. This could be due to an increase in stock price or a rapid accumulation of retained earnings or a combination of both.

2. The Pepperpot Company's stock is selling for $52. Its last dividend was $4.50, and the firm is expected to grow at 7% indefinitely. Flotation costs associated with the sale of common stock are 10% of the proceeds raised. Estimate Pepperpot's cost of retained earnings.

a. 12.5%
b. 14.3%
c. **16.3%**
d. 17.5%
3. The Pepperpot Company's stock is selling for $52. Its last dividend was $4.50, and the firm is expected to grow at 7% indefinitely. Flotation costs associated with the sale of common stock are 10% of the proceeds raised. Estimate Pepperpot's cost of equity from the sale of new stock.

a. 16.3%
b. 17.3%
c. 14.2%
d. 12.1%

ANSWER: b

SOLUTION:

\[ k_e = \frac{D_0(1 + g)}{(1 - F)P_0} + g = \frac{$4.50(1.07)}{(0.9)$52} + 0.07 = 17.3\% \]

4. Randal Flapjack is a retired short-order cook living on a fixed income in the state of Utopia where all financial markets are perfectly efficient. Randal has 20,000 shares of the Sugarcooky Corp., which pays an annualized dividend of $1.00 per share. Sugarcooky sells at a P/E of 10, has maintained a payout ratio of 50% for many years, and has not grown in some time. Management has recently announced that it will reduce Sugarcooky's payout ratio to 25% but expects earnings to grow at 5% from now on.

What is Sugarcooky's current price?

a. $10
b. $50
c. $20
d. $1.50

ANSWER: c

SOLUTION:
Payout ratio = 50%, Dividend = $1.00
EPS = $1/0.50 = $2
P = EPS x P/E = $20

5. Randal Flapjack is a retired short-order cook living on a fixed income in the state of Utopia where all financial markets are perfectly efficient. Randal has 20,000 shares of the Sugarcooky Corp., which pays an annualized dividend of $1.00 per share. Sugarcooky sells at a P/E of 10, has maintained a payout ratio of 50% for many years, and has not grown in some time. Management has recently announced that it will reduce Sugarcooky's payout ratio to 25% but expects earnings to grow at 5% from now on.

How much current income is Randal losing as a result of management's action?

- a. $20,000
- b. $10,000
- c. $5,000
- d. $1,000

**ANSWER:** b

**SOLUTION:**

D = $2.00 x 0.25 = $0.50, a reduction of $0.50 per share.

$0.50 x 20,000 = $10,000

6. Randal Flapjack is a retired short-order cook living on a fixed income in the state of Utopia where all financial markets are perfectly efficient. Randal has 20,000 shares of the Sugarcooky Corp., which pays an annualized dividend of $1.00 per share. Sugarcooky sells at a P/E of 10, has maintained a payout ratio of 50% for many years, and has not grown in some time. Management has recently announced that it will reduce Sugarcooky's payout ratio to 25% but expects earnings to grow at 5% from now on.

If Randal keeps his money in Sugarcooky but needs to maintain his current income, how many shares will he have to sell in the first year?

- a. 10
- b. 50
- c. 200
- d. 500

**ANSWER:** d

**SOLUTION:**

$10,000/$20 = 500 shares.

7. Randal Flapjack is a retired short-order cook living on a fixed income in the state of Utopia where all financial markets are perfectly efficient. Randal has 20,000 shares of the Sugarcooky Corp., which pays an annualized dividend of $1.00 per share. Sugarcooky sells at a P/E of 10, has maintained a payout ratio of 50% for many years, and has not grown in some time. Management has recently announced that it will reduce Sugarcooky's payout ratio to 25% but expects earnings to grow at 5% from now on.

What will be the value of his remaining shares (assuming that he sells off shares to maintain his current income) at the end of a year if the P/E remains the same? Is his investment growing?
8. The Addington Book Company has the following equity position. The stock is currently selling for $3 per share.

| Common Stock (8 million shares outstanding, $2 par) | $16,000,000 |
| Paid in Excess | 4,000,000 |
| Retained Earnings | 12,000,000 |
| Total Common Equity | $32,000,000 |
| Book Value per share | $4.00 |

What was the average price at which the company originally sold its stock? Reconstruct the equity statement above to reflect a four-for-one stock split.

- a. $1.75
- b. $2.00
- c. **$2.50**
- d. $2.75

**ANSWER:** c

**SOLUTION:**

Amount paid for 8M shares:

| Par | $16M |
| Excess | 4M |
| Total | $20M |

Original price = $20M/8M shares = $2.50 per share.

Four-for-one Stock Split:

| Common Stock (24 million shares outstanding, $.667 par) | $16,000,000 |
| Paid in Excess | 4,000,000 |
| Retained Earnings | 12,000,000 |
| Total Common Equity | $32,000,000 |
9. The Alligator Lock Company is planning a two-for-one stock split. You own 5,000 shares of Alligator's common stock that is currently selling for $120 a share. What is the value of your Alligator stock now, and what will it be after the split? Alligator's CFO says that the value of the shares will decline less than proportionately with the split because the stock is now out of its trading range. If the decline is 45%, how much will the split make you?

- a. $600,000 now; $600,000 after; $60,000 gain
- b. $600,000 now; $750,000 after; $60,000 gain
- c. $600,000 now; $600,000 after; $10,000 gain
- d. $500,000 now; $500,000 after; $60,000 gain

**ANSWER:** a

**SOLUTION:**

Now 5,000 x $120 = $600,000  
After 10,000 x $60 = $600,000

45% decline implies new P = $120 (1 - .45) = $66  
Value = 10,000 x $66 = $660,000  
Gain = $60,000

10. Husky Enterprises recently sold an issue of 10-year maturity bonds. The bonds were sold at a deep discount price of $615 each. After flotation costs, Husky received $604.50 each. The bonds have a $1,000 maturity value and pay $50 interest at the end of each year. Compute the after-tax cost of debt for these bonds if Husky's marginal tax rate is 40 percent.

- a. 3.2%  
- b. .6%  
- c. 7.2%  
- d. 12%

**ANSWER:** c

**SOLUTION:**

(Using the table)
$604.50 = $50 (PVIFA_{10}) + $1,000 (PVIF_{10})
Try i = 12%
$604.50 = $50 (5.650) + $1,000 (0.322)
$604.50 = $604.5

\[ k_i = 12\% \times (1 - 0.4) \]
\[ k_i = 7.2\% \]

**KEYSTROKES:**

<table>
<thead>
<tr>
<th>HP</th>
<th>TI</th>
</tr>
</thead>
<tbody>
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<td>605.5 [+/-] [PV]</td>
<td>605.5 [+/-] [PV]</td>
</tr>
<tr>
<td>1,000 [FV]</td>
<td>1,000 [FV]</td>
</tr>
<tr>
<td>50 [PMT]</td>
<td>50 [PMT]</td>
</tr>
<tr>
<td>10 [N]</td>
<td>10 [N]</td>
</tr>
<tr>
<td>[I/YR]</td>
<td>[CPT] [I/Y]</td>
</tr>
</tbody>
</table>

**Partial solution:** 12.00

\[ \times \] \[ ( \] \[ - \] \[ 0.4 \] \[ ) \] \[ = \]

**Solution:** 7.2

11. Calculate the after-tax cost of preferred stock for Bozeman-Western Airlines, Inc., which is planning to sell $10 million of $6.50 cumulative preferred stock to the public at a price of $50 a share. Issuance costs are estimated to be $2 a share. The company has a marginal tax rate of 40%.

a. 15%

b. **13.54%**

c. 12.74%

d. 11.15%

**ANSWER:** **b**

**SOLUTION:**

\[ k_p = \frac{D_p}{P_{net}} = \frac{6.50}{(50 - 2)} = 0.1354 \text{ or } 13.54\% \]

12. The Hartley Hotel Corporation is planning a major expansion. Hartley is financed 100 percent with equity and intends to maintain this capital structure after the expansion. Hartley’s beta is 0.9. The expected market return is 16% and the risk-free rate is 10%. If the expansion is expected to produce an internal rate of return of 17%, should Hartley make the investment?

a. Hartley should make the investment.

b. Hartley should not make the investment.

**ANSWER:** **a**

**SOLUTION:**

\[ k_s = 10\% + 0.9 \times (16\% - 10\%) = 15.4\% \]

Because the expected return (17%) exceeds the cost of equity capital (15.4%), Hartley should
13. Globe Steel has decided to diversify into the home improvement field. As a result of this expansion, Globe’s beta value drops from 1.3 to 0.9, and the expected future long-term growth rate in the firm’s dividends drops from 8 to 7%. The expected market return is 14%; the risk-free rate is 7%, and the current dividends per share, \( D_0 \), are $3. Should Globe undertake the planned diversification?

- **Globe should diversify.**
- **Globe should not diversify.**

**ANSWER:** a

**SOLUTION:**

**Value of a share assuming no diversification:**

\[
\hat{k}_s = 0.07 + (0.14 - 0.07) 1.3 = 0.161 \text{ or } 16.1\%
\]

\[
\hat{D}_0 = \frac{D_0 (1.08)}{(0.161 - 0.08)} = \$40
\]

**Value of a share assuming diversification:**

\[
\hat{k}_s = 0.07 + (.14 - 0.07) 0.9 = 0.133 \text{ or } 13.3\%
\]

\[
\hat{D}_0 = \frac{D_0 (1.07)}{(0.133 - 0.07)} = \$50.95
\]

Since diversification is expected to increase the price of Globe’s stock, Globe should diversify.

14. Jersey Computer Company has estimated the costs of debt and equity capital (with bankruptcy and agency costs) for various proportions of debt in its capital structure:

<table>
<thead>
<tr>
<th>Proportion of Debt</th>
<th>Cost of Debt, ( k_d ) (I-T)</th>
<th>Cost of Equity, ( k_c )</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>-</td>
<td>12.0%</td>
</tr>
<tr>
<td>0.10</td>
<td>4.7%</td>
<td>12.1</td>
</tr>
<tr>
<td>1.20</td>
<td>4.9</td>
<td>12.5</td>
</tr>
<tr>
<td>0.30</td>
<td>5.1</td>
<td>13.0</td>
</tr>
<tr>
<td>0.40</td>
<td>5.5</td>
<td>13.9</td>
</tr>
<tr>
<td>0.50</td>
<td>6.1</td>
<td>15.0</td>
</tr>
<tr>
<td>0.60</td>
<td>7.5</td>
<td>17.0</td>
</tr>
</tbody>
</table>

Determine the firm's optimal capital structure. Suppose that the firm's current capital structure consists of 30% debt (and 70% equity). Determine how much higher its weighted average cost of capital is than at the optimal capital structure.

- **Optimal: 40% debt, 60% equity**
- **Optimal: 25% debt, 75% equity**
- **Optimal: 45% debt, 55% equity**
- **Optimal: 35% debt, 65% equity**

**ANSWER:** a

**SOLUTION:**
15. Jacobs Corporation earned $2 million after taxes. The firm has 1.6 million shares of common stock outstanding. Compute the earnings per share of Jacobs. If Jacobs' dividend policy calls for a 40% payout ratio, what are the dividends per share?

- **a. EPS = $1.60; DPS = $0.40**
- **b. EPS = $1.40; DPS = $0.50**
- **c. EPS = $1.25; DPS = $0.50**
- **d. EPS = $1.10; DPS = $0.60**

**ANSWER:** **c**

**SOLUTION:**

\[
\text{EPS} = \frac{2,000,000}{1,600,000} = $1.25 \\
\text{DPS} = 1.25(0.4) = $0.50
\]

16. Wolverine Corporation plans to pay a $3 dividend per share on each of its 300,000 shares next year. Wolverine anticipates earnings of $6.25 per share over the year. If the company has a capital budget requiring an investment of $4 million over the year and it desires to maintain its present debt to total assets (debt ratio) of 0.40, how much external equity must it raise? Assume Wolverine’s capital structure includes only common equity and debt, and that debt and equity will be the only sources of funds to finance capital projects over the year.

- **a. $975,000**
- **b. $1,275,000**
- **c. $2,400,000**
- **d. **$1,425,000**

**ANSWER:** **d**

**SOLUTION:**

Retention for coming year:
\[
$6.25 - $3.00 = $3.25/\text{share} \\
300,000 \text{ shares} \times $3.25/\text{share} = $975,000 \text{ total retained equity for year}
\]

Equity portion of capital budget requirements:
0.60 ($4,000,000) = $2,400,000
External equity needed:
$2,400,000
-975,000
$1,425,000

17. Clynne Resources expects earnings this year to be $2 per share, and plans to pay a dividend of $0.70 for the year. During the year Clynne expects to borrow $10 million in addition to its already outstanding loan balances. Clynne has 10 million shares of common stock outstanding. If all capital outlays are funded from retained earnings and new borrowings and if Clynne follows a residual dividend policy, what capital outlays are planned for the coming year?

a. $1,300,000
b. $13,000,000
c. **$23,000,000**
d. $27,000,000

**ANSWER:** c

**SOLUTION:**

Capital outlays = debt funds raised plus equity retained
= $10 million + $1.3(10 million shares)
= $23 million

18. Sealtight, Incorporated has just negotiated a 5-year term loan of $8,000,000. The loan is fully amortized at an annual rate of interest of 12%. What are the required annual payments?

a. $3,600,000
b. $2,115,000
c. $2,000,140
d. **$2,219,263**

**ANSWER:** d

**SOLUTION:**

\[
\text{Annual Payment} = \frac{\text{Loan}}{\text{PVIFA}_{12\%, 5}} = \frac{8,000,000}{\text{PVIFA}_{12\%, 5}} = \frac{8,000,000}{3.6048} = \$2,219,263.20
\]

**KEYSTROKES:**

**HP**
8,000,000.00 [PV]
0 [FV]
5 [N]
12 [I/YR]
[PMT]
**Solution:** -2,219,277.86 (cost)

**TI**
8,000,000.00 [PV]
0 [FV]
5 [N]
12 [I/Y]
[CPT] [PMT]
**Solution:** -2,219,277.86 (cost)
19. A zero coupon bond with a $1,000 par value and a maturity of 8 years has a yield-to-maturity of 12%. What is the current price? If the yield-to-maturity remains constant, what will be the bond's price 7 years before maturity? One year before maturity?

a. $404; $452; $89
b. $440; $452; $893
c. $304; $402; $883
d. $414; $452; $893

ANSWER: a

SOLUTION:

\[ V_B = (0) \cdot (PVIFA_{i,n}) + (PAR) \cdot (PVIF_{i,n}) \]
\[ V_B = ($1,000) \cdot (PVIF_{12\%,8}) = ($1,000) \cdot (0.404) = $404 \]
\[ V_B = ($1,000) \cdot (DF_{0.12,7}) = ($1,000) \cdot (0.452) = $452 \]
\[ V_B = ($1,000) \cdot (PVIF_{12\%,1}) = ($1,000) \cdot (0.893) = $893 \]

20. As an alternative to zero coupon bonds, Pacific Oil is considering the issuance of "deep discount" bonds. The bonds would have a 10-year maturity, $1,000 par value, and a 6% coupon rate even though the yield-to-maturity is expected to be 14%. Interest is paid annually. What is the expected price of each bond? In order to raise the needed $400,000,000, how large must the principal of the bond issue be?

a. Bond price, $582.96; principal, $582,961,420
b. Bond price, $258.96; principal, $682,961,420
c. Bond price, $582.96; principal, $686,153,420
d. Bond price, $592.96; principal, $686,961,420

ANSWER: c

SOLUTION:

\[ V_B = (\text{Int}) \cdot (PVIFA_{i,n}) + (\text{PAR}) \cdot (PVIF_{i,n}) \]
\[ V_B = ($60) \cdot (PVIFA_{14\%,10}) + ($1,000) \cdot (PVIF_{14\%,10}) \]
\[ V_B = ($60) \cdot (5.216) + ($1,000) \cdot (0.270) = $582.96 \]

Usable Funds = Face Value \( \left( \frac{\text{Issue Price}}{\text{Par Value}} \right) \)

\[ $400,000,000 = \text{Face Value} \left( \frac{\$582.96}{\$1,000} \right) \]

Face Value = \( \frac{$400,000,000 \cdot 0.58296}{\$1,000} = $686,153,420 \)

21. Diebold Pulp and Paper has decided to raise FF20,000,000 through a subscription of common stock. It has 2,000,000 shares of common stock currently outstanding that sell for FF120 per share. It has decided to set the subscription price at FF100 per share. How many shares must be issued to raise the desired amount of funds?

a. 225,000
b. 250,000
c. 200,000
d. 20,000
22. Ohio Plastics has the following net worth on its balance sheet:

<table>
<thead>
<tr>
<th>Common Stock ($1.50 per value)</th>
<th>$3,300,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contributed Capital In Excess-of-Par</td>
<td>25,400,000</td>
</tr>
<tr>
<td>Net Worth</td>
<td>$28,700,000</td>
</tr>
</tbody>
</table>

How many shares outstanding does the firm have? What is the average price per share?

- a. 1,200,000; $13.05
- b. 2,250,000; $13.25
- c. 2,200,000; $13.05
- d. 2,200,000; $13.75

**ANSWER:** c

**SOLUTION:**

\[
\text{Number of Shares Outstanding} = \frac{\text{Common Stock}}{\text{Par Value}} = \frac{3,300,000}{1.50} = 2,200,000
\]

\[
\text{Average Price per Share} = \frac{\text{Net Worth}}{\text{Number of Shares}} = \frac{28,700,000}{2,200,000} = 13.05
\]
Common Stock ($1.00 par value) 2,000,000
Capital Surplus 6,000,000
Retained Earnings 10,000,000
Total Equity $20,000,000

Calculate the book value per share of its common stock. Assuming that all 2,000,000 shares of common stock were sold at the same time, what was the price per share at the time of issue?

a. $18; $9
b. $9; $4.50
c. $9; $4
d. $12; $9

ANSWER: c

SOLUTION:

Total Equity $20,000,000
Preferred Stock -2,000,000
Common Equity $18,000,000

Book Value = $18,000,000/2,000,000 shares = $9.00 per share

Common stock at par $2,000,000
Capital surplus 6,000,000
Common Stock $8,000,000

Selling Price = $8,000,000/2,000,000 shares = $4.00 per share

24. Find the conversion price for a convertible $1,000 bond with a conversion ratio of 15. The market price of the common stock is $47.00 per share.

a. $470
b. $705
c. $740
d. $750

ANSWER: b

SOLUTION:

\[ P_c = \text{Conversion Ratio} \times \text{Current Market Price per Share} \]
\[ P_c = 15 \times 47.00 = 705 \]

25. Find the conversion price of a convertible $1,000 bond, convertible into common stock at $20.00 per share. The market price of the common stock is $18.00 per share.

a. $1,800
b. $800
c. $900
d. $180
26. A firm has a capital structure that is half debt and half common equity and totals $120,000,000. Sales are $180,000,000 with variable costs equal to 60% of sales and fixed operating costs of $30,000,000. It has 2,500,000 shares of common stock outstanding and interest on debt is 12%. If the corporate tax rate is 40%, find the EBIT, NI, BEP, ROE, and EPS.

   a. $42,000,000; $20,880,000; 35%; 34.8%; $8.35
   b. $72,000,000; $34,880,000; 35%; 34.8%; $8.35
   c. $42,000,000; $20,880,000; 25%; 33.8%; $8.35
   d. $42,500,000; $20,880,000; 35%; 34.8%; $10.35

ANSWER: a

SOLUTION:

EBIT:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$180,000,000</td>
</tr>
<tr>
<td>Variable Costs</td>
<td>-108,000,000</td>
</tr>
<tr>
<td></td>
<td>$72,000,000</td>
</tr>
<tr>
<td>Fixed Costs</td>
<td>-30,000,000</td>
</tr>
<tr>
<td>EBIT</td>
<td>$42,000,000</td>
</tr>
</tbody>
</table>

NI:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT</td>
<td>$42,000,000</td>
</tr>
<tr>
<td>Interest</td>
<td>-7,200,000</td>
</tr>
<tr>
<td></td>
<td>(60,000,000 x 0.12)</td>
</tr>
<tr>
<td>EBT</td>
<td>$34,800,000</td>
</tr>
<tr>
<td>Taxes</td>
<td>-13,920,000</td>
</tr>
<tr>
<td>NI</td>
<td>$20,880,000</td>
</tr>
</tbody>
</table>

BEP = $42,000,000/$120,000,000 = 35%

ROE = $20,880,000/$60,000,000 = 34.8%

EPS = $20,880,000/2,500,000 shares = $8.35

27. Winston Products' total assets equal £75,000,000. Its EPS and ROE are unaffected by changes in financial leverage. Given that its cost of debt is 8%, find Winston's EBIT.

   a. £800,000
b. £600,000
c. **£6,000,000**
d. £7,000,000

**ANSWER:** c

**SOLUTION:**

EPS and ROE will be unaffected by changes in financial leverage only when \( k_d = BEP \):

\[
BEP = \frac{EBIT}{Total\ Assets}\\
0.08 = \frac{EBIT}{£75,000,000}\\
EBIT = \left(\frac{£75,000,000}{0.08}\right) = £6,000,000
\]

28. The management of ACM Corporation is evaluating a change in the capital structure of the firm to benefit from the effects of financial leverage. The firm currently has assets of £10,000,000 financed entirely with 200,000 shares of common stock selling at $50 per share. The firm would alter its capital structure by borrowing funds at an interest rate of 12% and repurchasing shares at $50 per share. Management expects the firm to earn $1,500,000 next year before interest and taxes. The firm's tax rate is 50%. What is the expected earnings per share (EPS) and return on equity (ROE) at next year’s expected level of EBIT if the firm remains 100% equity financed?

a. EPS, $75; ROE, 15%
b. EPS, $37.50; ROE, 7.5%
c. **EPS, $3.75; ROE, 7.5%**
d. EPS, $7.50; ROE, 15%

**ANSWER:** c

**SOLUTION:**

<table>
<thead>
<tr>
<th>100% Equity Financed:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets</td>
</tr>
<tr>
<td>$10,000,000</td>
</tr>
<tr>
<td>Debt</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>Equity</td>
</tr>
<tr>
<td>10,000,000</td>
</tr>
<tr>
<td>Shares</td>
</tr>
<tr>
<td>200,000</td>
</tr>
<tr>
<td>EBIT</td>
</tr>
<tr>
<td>$1,500,000</td>
</tr>
<tr>
<td>-</td>
</tr>
<tr>
<td>Interest</td>
</tr>
<tr>
<td>-</td>
</tr>
<tr>
<td>EBT</td>
</tr>
<tr>
<td>$1,500,000</td>
</tr>
<tr>
<td>-Taxes</td>
</tr>
<tr>
<td>-$750,000</td>
</tr>
<tr>
<td>NI</td>
</tr>
<tr>
<td>$750,000</td>
</tr>
<tr>
<td><strong>EPS</strong> = \frac{750,000}{200,000\ \text{shares}} = $3.75**</td>
</tr>
</tbody>
</table>

29. Standex Products has estimated that its after-tax cost of debt is 6% and its cost of common equity is 16%. Standex expects to continue a policy of borrowing 30% of its needed capital with the remainder provided by common equity. Calculate its weighted average cost of capital.

a. 16%
b. 14%
c. **13%**  
d. **12%**

**ANSWER:** c

**SOLUTION:**

\[
\text{WACC} = (W_d)(k_d)(1-T) + (W_s)(k_s) \\
= (0.06)(0.30) + (0.16)(0.70) \\
= 0.018 + 0.112 = 0.130 = 13\%
\]

30. Ametek Shipping's last annual dividend was DM2.50 per share. Its common stock is selling for DM36.00 per share. If analysts are projecting 11% growth in earnings and dividends for the foreseeable future, what is Ametek Shipping's cost of common equity?

a. **7.7%**  
b. **11%**  
c. **1.87%**  
d. **18.7%**

**ANSWER:** d

**SOLUTION:**

\[
k_s = \frac{\frac{D_1}{P_0} + \frac{(D_0)(1+g)}{P_0} + g}{\frac{DM2.50(1+0.11)}{DM36.00}} + 0.11 = 0.077 + 0.11 = 0.187 = 18.7\%
\]

**KEYSTROKES:**

**HP**

2.5 [x] [ ' ] [ ( ]  
1[+]  
.11[ ' ] [ ) ] [ ÷ ]  
36[+]  
.11 [=]  
**Solution: 18.7**

**TI**

2.5 [x] [ ( ]  
1[+]  
.11[ ) ] [ ÷ ]  
36[+]  
.11 [=]  
**Solution: 18.7**

31. Because it has no plans for reinvestment, Barnes Corporation is expected to continue paying out 100% of its earnings as a dividend. EBIT is expected to be $1,000,000 per year indefinitely. There is no debt in Barnes capital structure, it has 100,000 shares of common stock outstanding, and the corporate tax rate is 40%. The next dividend is one year from now. The required rate of return on equity is 10%. Calculate the dividend per share each year, the current market price for Barnes' stock, and the market price of the stock one year from now.

a. **$6; $60; $60**  
b. **$4; $60; $60**  
c. **$6; $50; $60**  
d. **$5; $50; $60**
SOLUTION:

### Year 1 - $^{\infty}$

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Taxes</td>
<td>$400,000</td>
</tr>
<tr>
<td>NI</td>
<td>$600,000</td>
</tr>
<tr>
<td>Shares</td>
<td>100,000</td>
</tr>
<tr>
<td>EPS</td>
<td>$6.00</td>
</tr>
<tr>
<td>Payout Ratio</td>
<td>100%</td>
</tr>
<tr>
<td>$k_0$</td>
<td>10%</td>
</tr>
</tbody>
</table>

Dividend per Share = EPS x Payout Ratio

$\text{DPS,}^{\infty} = (\$6.00)(1.00) = \$6.00$

$\hat{\beta}_a = \text{DPS}/k = \$6.00/0.10 = \$60.00$

$\hat{\beta}_t = \text{DPS}/k = \$6.00/0.10 = \$60.00$

Since the EPS and DPS are constant over time, so is the market price of the stock. This is a no-growth stock, so the valuation formula used is identical to the perpetuity formula.

32. Rikon KK has 3,000,000 shares of stock outstanding selling for ¥4500 per share. The board has just declared a 20% stock dividend. If all other factors affecting the stock's price remain unchanged, calculate the market price per share after the stock dividend, and the total value of all shares of stock - before and after the dividend - held by an investor who owned 100 shares prior to the dividend.

a. After dividend, ¥3,750; all shares before, ¥135,000; all shares after, ¥375,000
b. After dividend, ¥3,600; all shares before, ¥250,000; all shares after, ¥375,000
c. After dividend, ¥4,500; all shares before, ¥375,000; all shares after, ¥450,000
d. **After dividend, ¥3,750; all shares before, ¥450,000; all shares after, ¥450,000**

**ANSWER: d**

**SOLUTION:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Market Value of Shares</td>
<td>¥13,500,000,000</td>
<td>¥13,500,000,000</td>
</tr>
<tr>
<td>No. of Outstanding Shares</td>
<td>3,000,000</td>
<td>3,600,000</td>
</tr>
<tr>
<td>Market Value per Share</td>
<td>¥4,500</td>
<td>¥3,750</td>
</tr>
</tbody>
</table>

$3,600,000 = (3,000,000)(1.20)$

<table>
<thead>
<tr>
<th>Calculation</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Shares</td>
<td>100</td>
<td>120</td>
</tr>
<tr>
<td>Market Value per Share</td>
<td>¥4,500</td>
<td>¥3,750</td>
</tr>
<tr>
<td>Total Value of Shares</td>
<td>¥45,000</td>
<td>¥45,000</td>
</tr>
</tbody>
</table>

The stockholder's wealth is unaffected by the stock dividend.