Sample Questions and Solutions
Public Comparables Question

Facts for Company XYZ:
- Closing stock price is $18.00
- 1,000 shares outstanding, and 100 outstanding options outstanding with an average exercise price of $4.50
- Total debt of $8,000 and cash of $350

<table>
<thead>
<tr>
<th>XYZ Income Statement</th>
<th>Reported</th>
<th>Normalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$12,000</td>
<td></td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td>8,000</td>
<td></td>
</tr>
<tr>
<td>Gross Profit</td>
<td></td>
<td>4,000</td>
</tr>
<tr>
<td>Depreciation &amp; Amortization</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>S,G&amp;A (a)</td>
<td>2,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Operating Income</td>
<td></td>
<td>1,000</td>
</tr>
<tr>
<td>Interest Expense</td>
<td>710</td>
<td></td>
</tr>
<tr>
<td>Pre-Tax Income</td>
<td></td>
<td>290</td>
</tr>
<tr>
<td>Taxes</td>
<td>116</td>
<td></td>
</tr>
<tr>
<td>Net Income</td>
<td></td>
<td>$174</td>
</tr>
</tbody>
</table>

(a) Includes a one-time legal settlement resulting in a charge of $1,000 pre-tax ($600 after-tax)

**Calculate:**
- XYZ Market and Enterprise Values
- Multiples of Sales, EBITDA, EBIT and Net Income
Public Comparables Solution

Assumptions:
Share price $18.00
Common shares outstanding 1,000

Calculations:
Basic shares outstanding 1,000
+ Options outstanding 100
= Potential shares 1,100
- Shares repurchased under TSM (25)
= Diluted shares 1,075
x Share price $18.00
= Market Value $19,350

8,000 + debt
(350) - cash

$27,000 = Enterprise Value
Normalize the Income Statement

<table>
<thead>
<tr>
<th></th>
<th>Reported</th>
<th>Adjustments</th>
<th>Normalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$12,000</td>
<td></td>
<td>$12,000</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td>8,000</td>
<td></td>
<td>8,000</td>
</tr>
<tr>
<td>Gross Profit</td>
<td>4,000</td>
<td></td>
<td>4,000</td>
</tr>
<tr>
<td>Depreciation</td>
<td>1,000</td>
<td></td>
<td>1,000</td>
</tr>
<tr>
<td>S,G&amp;A (a)</td>
<td>2,000</td>
<td>(1,000)</td>
<td>1,000</td>
</tr>
<tr>
<td>Operating Income</td>
<td>1,000</td>
<td>1,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Interest Expense</td>
<td>710</td>
<td></td>
<td>710</td>
</tr>
<tr>
<td>Pre-tax Income</td>
<td>290</td>
<td>1,000</td>
<td>1,290</td>
</tr>
<tr>
<td>Taxes</td>
<td>116</td>
<td>400 (b)</td>
<td>516</td>
</tr>
<tr>
<td>Net Income</td>
<td>$174</td>
<td>$600</td>
<td>$774</td>
</tr>
</tbody>
</table>

(a) Includes a one-time legal settlement resulting in a charge of $1,000 pre-tax ($600 after-tax)
(b) Tax impact = pre-tax amount less after-tax amount: $1,000 - $600 = $400

Multiples:

<table>
<thead>
<tr>
<th></th>
<th>Enterprise Value /</th>
<th>Market Value /</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Revenues</td>
<td>EBITDA</td>
</tr>
<tr>
<td>Numerator:</td>
<td>$27,000</td>
<td>$27,000</td>
</tr>
<tr>
<td>Denominator:</td>
<td>$12,000</td>
<td>$3,000</td>
</tr>
<tr>
<td>Multiples:</td>
<td>2.25x</td>
<td>9.0x</td>
</tr>
</tbody>
</table>
Acquisition Comparables Question

Facts:
• Company A has agreed to buy TARGET for $20.00 a share in stock
• Company A and TARGET’s stock prices on the day before announcement were $35.00 and $16.00, respectively
• TARGET has 15,000 shares outstanding, 2,000 options outstanding with an average exercise price of $7.50 and $175,000 in net debt to be assumed by Company A

Target Income Statement Items:
<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTM Revenues</td>
<td>$625,000</td>
</tr>
<tr>
<td>LTM EBITDA</td>
<td>40,000</td>
</tr>
<tr>
<td>LTM Net Income</td>
<td>14,440</td>
</tr>
</tbody>
</table>

Calculate:
1) Implied exchange ratio
2) Premium paid
3) Offer Value and Transaction Value
4) Multiples of Sales, EBITDA and Net Income
Acquisition Comparables Solution

1) **Implied Exchange Ratio**
   
   Offer price \( \div \) Acquirer share price = Exchange Ratio
   
   \[
   \frac{\text{Offer price}}{\text{Acquirer share price}} = \text{Exchange Ratio}
   \]
   
   \[
   \frac{\$20.00}{\$35.00} = 0.571 \text{ Acquirer shares per TARGET share}
   \]

2) **Premium Paid**
   
   Offer price \( \div \) Historical Target's price = Premium Paid
   
   \[
   \frac{\text{Offer price}}{\text{Historical Target's price}} = \text{Premium Paid}
   \]
   
   \[
   \frac{\$20.00}{\$16.00} = 1.25 \text{ minus 1 (1.0)}
   \]
   
   \[
   = \text{Premium Paid} \quad 25.0\%
   \]

3) **Offer Value**
   
   Shares + Options = Potential shares
   
   \[
   \text{Shares} + \text{Options} = \text{Potential shares}
   \]
   
   \[
   15,000 + 2,000 = 17,000
   \]
   
   \[
   \text{x Share price} = \text{Potential shares} \times \text{Share price}
   \]
   
   \[
   17,000 \times \$20.00 = \$340,000
   \]
   
   - Option proceeds = \( \text{Option proceeds} \)
   
   \[
   \text{Potential shares} - \text{Option proceeds} = \text{Option proceeds}
   \]
   
   \[
   17,000 - (15,000) = 2,000 \text{ options} \times \$7.50 \text{ strike price}
   \]
   
   \[
   = \text{Option proceeds}
   \]
   
   \[
   \text{Offer Value} = \$325,000
   \]
3) Offer Value (method 2)

<table>
<thead>
<tr>
<th>Shares</th>
<th>15,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Options</td>
<td>2,000</td>
</tr>
<tr>
<td>= Potential shares</td>
<td>17,000</td>
</tr>
<tr>
<td>- Shares under TSM</td>
<td>(750)</td>
</tr>
<tr>
<td>= Diluted shares</td>
<td>16,250</td>
</tr>
<tr>
<td>x Share price</td>
<td>$20.00</td>
</tr>
<tr>
<td>= Offer Value</td>
<td>$325,000</td>
</tr>
</tbody>
</table>

3) Transaction Value

| Offer value  | $325,000 |
| + Net debt   | 175,000  |
| = Transaction Value | $500,000 |

4) Multiples

| Numerator: | $500,000  | $500,000  | $325,000  |
| Denominator: | $625,000  | $40,000   | $14,440   |
| Multiple | 0.80x     | 12.5x     | 22.5x     |
Discounted Cash Flow Question

<table>
<thead>
<tr>
<th></th>
<th>FYE+1</th>
<th>FYE+2</th>
<th>FYE+3</th>
<th>FYE+4</th>
<th>FYE+5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$418.0</td>
<td>$443.1</td>
<td>$469.7</td>
<td>$497.8</td>
<td>$527.7</td>
</tr>
<tr>
<td>EBITDA</td>
<td>50.2</td>
<td>53.2</td>
<td>56.4</td>
<td>59.7</td>
<td>63.3</td>
</tr>
<tr>
<td>Less: Depreciation &amp; Amortization (6.4)</td>
<td>(6.5)</td>
<td>(6.6)</td>
<td>(7.1)</td>
<td>(7.7)</td>
<td></td>
</tr>
<tr>
<td>EBIT</td>
<td>43.8</td>
<td>46.7</td>
<td>49.8</td>
<td>52.6</td>
<td>55.6</td>
</tr>
<tr>
<td>Less: Taxes @ 40.0% (17.5)</td>
<td>(18.7)</td>
<td>(19.9)</td>
<td>(21.1)</td>
<td>(22.3)</td>
<td></td>
</tr>
<tr>
<td>Tax-effected EBIT</td>
<td>26.3</td>
<td>28.0</td>
<td>29.9</td>
<td>31.6</td>
<td>33.4</td>
</tr>
<tr>
<td>Plus: Depreciation &amp; Amortization 6.4</td>
<td>6.5</td>
<td>6.6</td>
<td>7.1</td>
<td>7.7</td>
<td></td>
</tr>
<tr>
<td>Less: Capital Expenditures (8.0)</td>
<td>(8.0)</td>
<td>(8.0)</td>
<td>(8.0)</td>
<td>(8.0)</td>
<td></td>
</tr>
<tr>
<td>Less: Changes in Working Capital (3.3)</td>
<td>(3.5)</td>
<td>(3.7)</td>
<td>(3.9)</td>
<td>(4.2)</td>
<td></td>
</tr>
<tr>
<td>Unlevered Free Cash Flow</td>
<td>$21.4</td>
<td>$23.0</td>
<td>$24.7</td>
<td>$26.8</td>
<td>$28.9</td>
</tr>
</tbody>
</table>

Shares Outstanding 21,250

Assumptions
- Perpetuity growth rate of 4.0%
- Terminal exit multiple of 7.0x
- Beta = 1.3
- Risk-free rate of 4.1%
- Market risk premium of 8.0%
- Cost of debt of 7.5%
- Debt of $119, cash of $0
- Market value of equity of $221
- Marginal tax rate of 40.0%

Calculate
1) Cost of equity
2) WACC
3) Present value of free cash flows
4) Present value of the terminal value based on perpetuity growth rate method
5) Present value of the terminal value based on the EBITDA exit multiple method
6) Equity value based on exit multiple terminal value
7) Equity value per share based on exit multiple terminal value
Discounted Cash Flow Solution

1) Cost of Equity
Risk-free rate 4.1%
+ Beta x mkt risk premium 10.4%
= Cost of Equity 14.5%

2) WACC
Weighted average cost of equity = cost of equity x E / (D+E)
9.4% = 14.5% x 221 / (119 + 221)

Weighted average cost of debt = cost of debt x D / (D+E) x (1 - tax rate)
1.6% = 7.5% x 119 / (119 + 221) x (1 - 40.0%)

WACC = WACost of Equity + WACost of Debt
WACC = 9.4% + 1.6% = 11.0%

3) Present value of free cash flows
\[ PV = \frac{FCF_n}{(1 + r)^n} \]

\[ \begin{align*}
PV_{FCF_0} &= 0.0 \\
PV_{FCF_1} &= 19.2 \\
PV_{FCF_2} &= 18.7 \\
PV_{FCF_3} &= 18.1 \\
PV_{FCF_4} &= 17.6 \\
PV_{FCF_5} &= 17.2 \\
\end{align*} \]

Sum of PV of FCF $90.8

4) PV of the terminal value based on perpetuity growth rate
\[ PV = \frac{[FCF_N \times (1 + g) / (r - g)]}{(1 + r)^n} \]

\[ \begin{align*}
PV &= \frac{[$28.9 \times (1 + 0.040) / (0.110 - 0.040)]}{(1 + 0.110)^5} = $254.9 \\
\end{align*} \]

5) PV of the terminal value based on the EBITDA exit multiple
\[ PV = \frac{(EBITDA_N \times \text{Multiple})}{(1 + r)^n} \]

\[ \begin{align*}
PV &= \frac{($63.3 \times 7.0)}{(1 + 0.11)^5} = $263.1 \\
\end{align*} \]

6) Equity value based on exit multiple terminal value
Equity value = PV of FCF’s + PV of terminal Value - net debt
Equity value = $90.8 + $263.1 - $119.0 = $234.8

7) Equity value per share based on exit multiple terminal value
Equity value per share = $234.8 / 21.250 = $11.05
# Merger Consequences Question

<table>
<thead>
<tr>
<th>Acquirer Information *</th>
<th>Target Information *</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current share price</strong></td>
<td>$67.69</td>
</tr>
<tr>
<td>Total assets</td>
<td>$7,604.3</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>$3,040.8</td>
</tr>
<tr>
<td>Existing goodwill</td>
<td>$134.7</td>
</tr>
<tr>
<td>Tax rate</td>
<td>35.0%</td>
</tr>
<tr>
<td>Interest on new debt</td>
<td>4.0%</td>
</tr>
<tr>
<td>Net income</td>
<td>$1,003.1</td>
</tr>
<tr>
<td>Diluted shares outstanding</td>
<td>271.100</td>
</tr>
<tr>
<td>EPS</td>
<td>$3.70</td>
</tr>
<tr>
<td><strong>Current share price</strong></td>
<td>$13.46</td>
</tr>
<tr>
<td>Total assets</td>
<td>$434.3</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>$99.9</td>
</tr>
<tr>
<td>Existing goodwill</td>
<td>$24.6</td>
</tr>
<tr>
<td>Net income</td>
<td>$46.0</td>
</tr>
<tr>
<td>Diluted shares outstanding</td>
<td>69.372</td>
</tr>
<tr>
<td>EPS</td>
<td>$0.66</td>
</tr>
<tr>
<td>Offer price (per share)</td>
<td>$16.15</td>
</tr>
<tr>
<td>Transaction expenses</td>
<td>$10.0</td>
</tr>
</tbody>
</table>

* Dollars and shares in millions, except per share data.

Pro Forma EPS = 
\[
\frac{(\text{Acq Net Income} + \text{Target Net Income} + "Adjustments")}{(\text{Acq Shares} + \text{New Shares Issued})}
\]
Merger Consequences Question (cont'd)

Assuming a 80% stock, 20% cash purchase,

A) Offer value  
B) Goodwill created (assuming no write-up)

C) Exchange ratio  
D) Number of shares issued to the Target

E) New debt issued  
F) After-tax cost of new debt issued

G) Accretion / (dilution) amount (in $)  
H) Pre-tax synergies to breakeven
Merger Consequences Solution

Assuming a 80% stock, 20% cash purchase,

A) Offer value

Offer price x Target's shares outstanding = Offer Value
$16.15 x 69.372 = $1,120.4

B) Goodwill created (assuming no write-up)

Offer value $1,120.4
less Tangible book value $309.8
Goodwill = $810.6

*Tangible book value = Assets - existing goodwill - liabilities
$309.8 = $434.3 - $99.9 - $24.6

C) Exchange ratio

Offer Price $16.15 0.2386
Acquirer Price $67.69 At 100% stock!

D) Number of shares issued to the Target*

= Exchange ratio x Target shares x 80.0% stock
0.2386 x 69.372 x 80.0% = 13.241

or

Offer value ÷ Acquirer stock price x stock %
$1,120.4 ÷ $67.69 x 80.0% = 13.241

*NOTE: answers may differ due to rounding...

E) New debt issued

= Offer value x percentage of debt issued
$1,120.4 x 20% = $224.1

F) After-tax cost of new debt issued

= New debt issued x interest rate x (1 - tax rate)
$224.1 x 4.0% x (1 - 35.0%) = $5.8
Merger Consequences Solution (cont'd)

G) Accretion / (dilution) amount (in $)
Acquirer net income + Target net income +/- Adjustments = Pro forma net income
$1,003.1 + $46.0 + ($5.8) = $1,043.3

Pro forma net income ÷ Pro forma shares outstanding = Pro forma EPS
$1,043.3 ÷ (271.100 + 13.241) = $3.67

Pro forma EPS $3.669
(Less) Acquirer's Stand-alone EPS ($3.700)
= Accretion / (Dilution) ($0.031)

H) Pretax synergies to breakeven
Accretion / (dilution) ($) $0.031
x PF shares outstanding 284.341 = 271.100 + 13.241
= After-tax synergies needed $8.8

÷ (1- tax rate) 65.0%
= Pre-tax synergies needed $13.6
Leveraged Buyout Question

- A financial sponsor is willing to buy Target for $325.0 MM
- The sponsor will invest 40.0% of the purchase price in equity
- In 5 years, the sponsor expects:
  - To sell the company for 8.0x EBITDA
  - Target to have net debt of $60.0 MM
  - Target to have EBITDA of $75.0 MM
- Please calculate the IRR to the sponsor


Leveraged Buyout Solution

Calculate the IRR to the sponsor

Purchase Price of Equity $325.0
× % of Equity 40.0%
= Initial Investment ($130.0)

Year 5 EBITDA $75.0
× Multiple 8.0
= Terminal Value $600.0
- Net Debt in year 5 (60.0)
= Future Value $540.0

N=5, PV=(130.0), PMT=0, FV=540.0
I = 33.0%