
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

XYZ Income Statement	Reported		Normalized
Sales	\$12,000		
Cost of Goods Sold	8,000		
Gross Profit	<u>4,000</u>		<u> </u>
Depreciation & Amortization	1,000		
S,G&A (a)	2,000	<input type="text"/>	
Operating Income	<u>1,000</u>		<u> </u>
Interest Expense	710		
Pre-Tax Income	<u>290</u>		<u> </u>
Taxes	116	<input type="text"/>	
Net Income	<u>\$174</u>		<u> </u>

(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	In-the-money options	100
<u>+ Options outstanding</u>	<u>100</u>	<u>x Average strike price</u>	<u>\$4.50</u>
= Potential shares	1,100	= Option proceeds	\$450
<u>- Shares repurchased under TSM</u>	<u>(25)</u>	<u>÷ Share price</u>	<u>\$18.00</u>
= Diluted shares	1,075	= Shares rep. under TSM	25
<u>x Share price</u>	<u>\$18.00</u>		
= Market Value	\$19,350		
	8,000 + debt		
	<u>(350) - cash</u>		
	\$27,000 = Enterprise Value		

Public Comparables Solution (cont'd)

Normalize the Income Statement

	Reported	Adjustments	Normalized	
Sales	\$12,000		\$12,000	
Cost of Goods Sold	8,000		8,000	
Gross Profit	4,000		4,000	
Depreciation	1,000		1,000	
S,G&A (a)	2,000	(1,000)	1,000	
Operating Income	1,000	1,000	2,000	EBIT
Interest Expense	710		710	
Pre-tax Income	290	1,000	1,290	
Taxes	116	400 (b)	516	
Net Income	\$174	\$600	\$774	

(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:

	<u>Enterprise Value /</u>			<u>Market Value /</u>
	Revenues	EBITDA	EBIT	Net Income
Numerator:	\$27,000	\$27,000	\$27,000	\$19,350 Equity Value
Denominator:	\$12,000	\$3,000	\$2,000	\$774 Adjusted (normalized) values
Multiples:	2.25x	9.0x	13.5x	25.0x

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:

LTM Revenues	\$625,000
LTM EBITDA	40,000
LTM Net Income	14,440

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	\$20.00	
÷ Acquirer share price	\$35.00	
= Exchange Ratio	0.571	Acquirer shares per TARGET share

2) Premium Paid

Offer price	\$20.00
÷ Historical Target's price	\$16.00
=	1.25
minus 1	(1.0)
= Premium Paid	25.0%

3) Offer Value

Shares	15,000	
+ Options	<u>2,000</u>	
= Potential shares	17,000	
x Share price	<u>\$20.00</u>	
=	\$340,000	
- Option proceeds	(15,000)	>>>> = 2,000 options * \$7.50 strike price
= Offer Value	\$325,000	

Acquisition Comparables Solution *(cont'd)*

3) Offer Value (method 2)

Shares	15,000
+ <u>Options</u>	<u>2,000</u>
= Potential shares	17,000
- <u>Shares under TSM</u>	<u>(750)</u>
= Diluted shares	16,250
x Share price	\$20.00
= Offer Value	\$325,000

In-the-money outstanding options	2,000
x <u>Average strike price</u>	<u>\$7.50</u>
= Option proceeds	\$15,000
÷ <u>Share price</u>	<u>\$20.00</u>
= Shares rep. under TSM	750

3) Transaction Value

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

4) Multiples

	<u>Transaction Value /</u>		<u>Offer Value /</u>
	<u>Sales</u>	<u>EBITDA</u>	<u>Net Income</u>
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

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

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)

$$9.4\% = 14.5\% \times 221 / (119 + 221)$$

Weighted average cost of debt = cost of debt x D / (D+E) x (1 - tax rate)

$$1.6\% = 7.5\% \times 119 / (119 + 221) \times (1 - 40.0\%)$$

WACC = WACost of Equity + WACost of Debt

$$\text{WACC} = 9.4\% + 1.6\% = 11.0\%$$

3) Present value of free cash flows

$$PV = FCF_N / (1 + r)^n$$

$$PV \text{ of } FCF_0 = \$0.0$$

$$PV \text{ of } FCF_1 = 19.2$$

$$PV \text{ of } FCF_2 = 18.7$$

$$PV \text{ of } FCF_3 = 18.1$$

$$PV \text{ of } FCF_4 = 17.6$$

$$PV \text{ of } FCF_5 = 17.2$$

$$\text{Sum of PV of FCF} = \boxed{\$90.8}$$

4) PV of the terminal value based on perpetuity growth rate

$$PV = [FCF_N \times (1 + g) / (r - g)] / (1 + r)^n$$

$$PV = [\$28.9 \times (1 + 0.040) / (0.110 - 0.040)] / (1 + 0.110)^5 = \$254.9$$

5) PV of the terminal value based on the EBITDA exit multiple

$$PV = (EBITDA_N \times \text{Multiple}) / (1 + r)^n$$

$$PV = (\$63.3 \times 7.0) / (1 + 0.11)^5 = \$263.1$$

6) Equity value based on exit multiple terminal value

Equity value = PV of FCF's + PV of terminal Value - net debt

$$\text{Equity value} = \$90.8 + \$263.1 - \$119.0 = \$234.8$$

7) Equity value per share based on exit multiple terminal value

$$\text{Equity value per share} = \$234.8 / 21.250 = \$11.05$$

Merger Consequences Question

Acquirer Information *	
Current share price	\$67.69
Total assets	\$7,604.3
Total liabilities	\$3,040.8
Existing goodwill	\$134.7
Tax rate	35.0%
Interest on new debt	4.0%
Net income	\$1,003.1
Diluted shares outstanding	271.100
EPS	\$3.70

Target Information *	
Current share price	\$13.46
Total assets	\$434.3
Total liabilities	\$99.9
Existing goodwill	\$24.6
Net income	\$46.0
Diluted shares outstanding	69.372
EPS	\$0.66
Offer price (per share)	\$16.15
Transaction expenses	\$10.0

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

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Pro Forma EPS =

$$\frac{(\text{Acq Net Income} + \text{Target Net Income} + \text{"Adjustments"})}{(\text{Acq Shares} + \text{New Shares Issued})}$$

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
 $\$16.15 \times 69.372 = \$1,120.4$

B) Goodwill created (assuming no write-up)

Offer value	\$1,120.4
less Tangible book value	<u>(309.8) *</u>
Goodwill =	\$810.6

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

C) Exchange ratio

<u>Offer Price</u>	\$16.15	0.2386
Acquirer Price	<u>\$67.69</u>	At 100% stock!
0.2386 x 80.0% =	0.1909	

D) Number of shares issued to the Target*

= Exchange ratio x Target shares x 80.0% stock
 $0.2386 \times 69.372 \times 80.0\% = 13.241$
 or

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

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

E) New debt issued

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

F) After-tax cost of new debt issued

= New debt issued x interest rate x (1- tax rate)
 $\$224.1 \times 4.0\% \times (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 \div Pro forma shares outstanding = **Pro forma EPS**

$$\$1,043.3 \div (271.100 + 13.241) = \$3.67$$

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

H) Pretax synergies to breakeven

Accretion / (dilution) (\$)	\$0.031	
<u>x PF shares outstanding</u>	<u>284.341</u>	= 271.100 + 13.241
= After-tax synergies needed	\$8.8	

<u>\div (1- tax rate)</u>	<u>65.0%</u>
= 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
<u>x % of Equity</u>	<u>40.0%</u>
= Initial Investment	(\$130.0)

Year 5 EBITDA	\$75.0
<u>x Multiple</u>	<u>8.0</u>
= Terminal Value	\$600.0
<u>- Net Debt in year 5</u>	<u>(60.0)</u>
= Future Value	\$540.0

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

I = 33.0%