Investment Banking 3rd edition Rosenbaum Solutions Manual

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Solutions Manual

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CHAPTER 1 ANSWERS AND RATIONALE

1) Calculation of fully diluted shares outstanding

= Net New Shares From Options + Basic Shares Outstanding
= 1.500 million + 98.500 million

= Shares from In-the-Money Options - Shares Repurchased
= 2.750 million - 1.250 million

= Total Option Proceeds / Current Share Price
= $62.5 million / $50.00

= Total In-the-Money Shares

($ in millions, except per share data; shares in millions)

Calculation of Fully Diluted Shares Outstanding	
Basic Shares Outstanding	98.500
Plus: Shares from In-the-Money Options	2.750
Less: Shares Repurchased	(1.250)
Net New Shares from Options	**1.500**
Plus: Shares from Convertible Securities	-
Fully Diluted Shares Outstanding	**100.000**

Options/Warrants

Tranche	Number of Shares	Exercise Price	In-the-Money Shares	Proceeds
Tranche 1	1.250	$10.00	1.250	$12.5
Tranche 2	1.000	30.00	1.000	30.0
Tranche 3	0.500	40.00	0.500	20.0
Tranche 4	0.250	60.00	-	-
Tranche 5	-	-	-	-
Total	**3.000**	-	**2.750**	**$62.5**

= Tranche 1 In-the-Money Shares
+ Tranche 2 In-the-Money Shares
+ Tranche 3 In-the-Money Shares
= 1.250 million + 1.000 million + 0.500 million

= IF(Weighted Average Strike Price < Current Share Price, display Number of Shares, otherwise display 0)
= IF($10.00 < $50.00, 1.250, 0)

= Tranche 1 In-the-Money Proceeds
+ Tranche 2 In-the-Money Proceeds
+ Tranche 3 In-the-Money Proceeds
= $12.5 million + $30.0 million + $20.0 million

= IF(In-the-Money Shares > 0, then In-the-Money Shares x Weighted Average Strike Price, otherwise display 0)
= IF(1.250 > 0, 1.250 x $10.00, 0)

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a. 2.75 million. The total number of in-the-money options/warrants is calculated by adding the in-the-money shares from the tranches which have an exercise price lower than the current share price of $50.00. (1.250 million shares + 1.000 million shares + 0.500 million shares)

b. $62.5 million. The total proceeds from in-the-money options/warrants is calculated by adding the proceeds from the tranches which have an exercise price lower than the current share price of $50.00. ($12.5 million + $30.0 million + $20.0 million)

c. 1.50 million. Under the TSM, the $62.5 million of potential proceeds received by Gasparro is used to repurchase shares that are currently trading at $50.00. Therefore, the number of shares repurchased is 1.25 million ($62.5 million / $50.00) of the options. To calculate net new shares, the shares repurchased are subtracted from the total number of in-the-money options/warrants. (2.75 million shares – 1.25 million shares)

d. 100.0 million. Fully diluted shares are calculated as net new shares plus basic shares outstanding. (98.5 million shares + 1.50 million shares)

2) Calculation of equity value and enterprise value

($ in millions, except per share data; shares in millions)

Selected Market Data		
Current Price	12/20/2019	$50.00
% of 52-week High		*80.0%*
52-week High Price	7/19/2019	62.50
52-week Low Price	4/5/2019	40.00
Dividend Per Share (MRQ)		0.25
Fully Diluted Shares Outstanding		100.000
Equity Value		**$5,000.0**
Plus: Total Debt		1,850.0
Plus: Preferred Stock		-
Plus: Noncontrolling Interest		-
Less: Cash and Cash Equivalents		(100.0)
Enterprise Value		**$6,750.0**

= Equity Value + Total Debt - Cash
= $5,000.0 million + $1,850.0 million - $100.0 million

= Current Share Price x Fully Diluted Shares Outstanding
= $50.00 x 100.0 million

a. $5,000.0 million. Equity value is calculated by multiplying fully diluted shares by the current share price. (100.0 million shares x $50.00)

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b. $6,750.0 million. Enterprise value is calculated as equity value plus total debt less cash and cash equivalents. ($5,000.0 million + $1,850.0 million – $100.0 million)

3) Adjusting for one-time and non-recurring items

EBIT$_{2018}$ + EBIT$_{9/30/2019\ Current\ Stub}$ - EBIT$_{9/30/2018\ Prior\ Stub}$
= $650.0 million + $575.0 million - $500.0 million

Gross Profit$_{2018}$ + Gross Profit$_{9/30/2019\ Current\ Stub}$ - Gross Profit$_{9/30/2018\ Prior\ Stub}$
= $1,575.0 million + $1,280.0 million - $1,175.0 million

Restructuring charge

Inventory valuation charge ("write-off")

Gain on sale of non-core business ("asset sale")

($ in millions, except per share data)

Adjusted Income Statement

	Fiscal Year Ending December 31,			Prior Stub	Current Stub	LTM
	2016A	2017A	2018A	9/30/2018	9/30/2019	9/30/2019
Reported Gross Profit	$1,300.0	$1,450.0	$1,575.0	$1,175.0	$1,250.0	$1,650.0
Non-recurring Items in COGS	-	-	-	-	30.0	30.0
Adj. Gross Profit	**$1,300.0**	**$1,450.0**	**$1,575.0**	**$1,175.0**	**$1,280.0**	**$1,680.0**
% margin	*34.7%*	*34.9%*	*35.0%*	*34.8%*	*35.6%*	*35.6%*
Reported EBIT	$550.0	$620.0	$675.0	$500.0	$530.0	$705.0
Non-recurring Items in COGS	-	-	-	-	30.0	30.0
Other Non-recurring Items	-	-	(25.0)	-	15.0	(10.0)
Adjusted EBIT	**$550.0**	**$620.0**	**$650.0**	**$500.0**	**$575.0**	**$725.0**
% margin	*14.7%*	*14.9%*	*14.4%*	*14.8%*	*16.0%*	*15.3%*
Depreciation & Amortization	155.0	165.0	175.0	125.0	125.0	175.0
Adjusted EBITDA	**$705.0**	**$785.0**	**$825.0**	**$625.0**	**$700.0**	**$900.0**
% margin	*18.8%*	*18.9%*	*18.3%*	*18.5%*	*19.4%*	*19.0%*
Reported Net Income	$330.0	$386.3	$429.8	$318.8	$342.8	$453.8
Non-recurring Items in COGS	-	-	-	-	30.0	30.0
Other Non-recurring Items	-	-	(25.0)	-	15.0	(10.0)
Non-operating Non-rec. Items	-	-	-	-	-	-
Tax Adjustment	-	-	6.3	-	(11.3)	(5.0)
Adjusted Net Income	**$330.0**	**$386.3**	**$411.0**	**$318.8**	**$376.5**	**$468.8**
% margin	*8.8%*	*9.3%*	*9.1%*	*9.4%*	*10.5%*	*9.9%*
Adjusted Diluted EPS	$3.30	$3.86	$4.11	$3.19	$3.77	$4.69

= Negative adjustment for pre-tax gain on asset sale x Marginal tax rate
= - ($25.0) million x 25%

= Add-back for pre-tax inventory and restructuring charges x Marginal tax rate
= - ($30.0 million + $15.0 million) x 25%

Net Income$_{2018}$ + Net Income$_{9/30/2019\ Current\ Stub}$ - Net Income$_{9/30/2018\ Prior\ Stub}$
= $411.0 million + $376.5 million - $318.8 million

Adjusted LTM EBIT + LTM Depreciation & Amortization
= $725.0 million + $175.0 million

a. $1,680.0 million. To calculate adjusted LTM gross profit first add back the $30.0 million non-recurring product obsolescence charge to COGS for the current stub 9/30/2019 period. LTM gross profit is then calculated by

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taking the full prior fiscal year's gross profit, adding the YTD gross profit for the current year period ("current stub"), and then subtracting the YTD gross profit from the prior year ("prior stub"). ($1,575.0 million + $1,280.0 million – $1,175.0 million)

b. $725.0 million. To calculate adjusted LTM EBIT first add back the $15.0 million restructuring charge and back out the $25.0 million gain on asset sale for the current stub 9/30/2019 period and fiscal year 2018 period, respectively. Next, the LTM statistic is calculated in the same manner as shown in 3(a). ($650.0 million + $575.0 million – $500.0 million)

c. $900.0 million. To calculate adjusted LTM EBITDA add LTM deprecation and amortization to LTM EBIT. ($725.0 million + $175.0 million)

d. $468.8 million. To calculate adjusted LTM net income, first add back the full non-recurring charges to net income. Then, to make the tax adjustment, multiply the full add back amount by Gasparro's marginal tax rate. Next, the LTM statistic is calculated in the same manner as shown in 3(a). ($411.0 million + $376.5 million – $318.8 million)

4) Return on investment ratios

LTM Return on Investment Ratios	
Return on Invested Capital	*21.1%*
Return on Equity	*28.2%*
Return on Assets	*9.5%*
Implied Annual Dividend Per Share	*2.0%*

= LTM Adjusted EBIT / Average (Total $Debt_{2018}$ - $Cash_{2018}$ + Shareholders' $Equity_{2018}$, Total $Debt_{9/30/2019}$ - $Cash_{9/30/2019}$ + Shareholders' $Equity_{9/30/2019}$)
= $725.0 million / (($1,875.0 million - $75.0 million + $1,600.0 million) + ($1,850.0 million - $100.0 million + $1,725.0 million) / 2)

= LTM Adjusted Net Income / Average (Shareholders' $Equity_{2018}$, Shareholders' $Equity_{9/30/2019}$)
= $468.8 million / ($1,725.0 million + $1,600.0 million) / 2

= LTM Adjusted Net Income / Average (Total $Assets_{2018}$, Total $Assets_{9/30/2019}$)
= $468.8 million / ($4,825.0 million + $5,000.0 million) / 2

= (Quarterly Dividend x 4) / Current Share Price
= ($0.25 x 4) / $50.00

a. 21.1%. Return on invested capital is calculated as LTM adjusted EBIT divided by the average of total invested capital (sum of debt and shareholders' equity less cash). ($725.0 million / (($1,875.0 million – $75.0 million + $1,600.0 million) + ($1,850.0 million – $100.0 million + $1,725.0 million) / 2))

b. 28.2%. Return on equity is calculated as LTM adjusted net income divided by average shareholders' equity. (($468.8 million / ($1,725.0 million + $1,600.0 million) / 2)

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c. 7.9%. Return on assets is calculated as LTM adjusted net income divided by average assets. ($468.8 million / ($4,825.0 million + $5,000.0 million) / 2)

d. 2.0%. Implied Average Divided Per Share is calculated as the most recent quarterly dividend multiplied by four and divided by the current share price. (($0.25 x 4) / $50.00)

5) Credit statistics

LTM Credit Statistics	
Debt/Total Capitalization	51.7%
Total Debt/EBITDA	2.1x
Net Debt/EBITDA	1.9x
EBITDA/Interest Expense	9.0x
(EBITDA-capex)/Interest Expense	7.0x
EBIT/Interest Expense	7.3x

= Total Debt$_{9/30/2019}$ / (Total Debt$_{9/30/2019}$ + Shareholders' Equity$_{9/30/2019}$)
= $1,850.0 million / ($1,850.0 million + $1,725.0 million)

= Total Debt$_{9/30/2019}$ / LTM Adjusted EBITDA
= $1,850.0 million / $900.0 million

= (Total Debt$_{9/30/2019}$ - Cash$_{9/30/2019}$) / LTM Adjusted EBITDA
= ($1,850.0 million - $100.0 million) / $900.0 million

= LTM Adjusted EBITDA / LTM Interest Expense
= $900.0 million / $100.0 million

= (LTM Adjusted EBITDA - Capex) / LTM Interest Expense
= ($900.0 million - $205.0 million) / $100.0 million

= LTM Adjusted EBIT / LTM Interest Expense
= $725.0 million / $100.0 million

a. 51.7%. Debt-to-total capitalization is calculated as debt divided by total capitalization. ($1,850.0 million / ($1,850.0 million + $1,725.0 million))

b. 2.1x. Total debt-to-EBITDA is calculated as total debt divided by LTM adjusted EBITDA. ($1,850.0 million / $900.0 million)

c. 1.9x. Net debt-to-EBITDA is calculated as net debt (total debt less cash) divided by LTM adjusted EBITDA. (($1,850.0 million – $100.0 million) / $900.0 million)

d. 9.0x. EBITDA-to-interest expense is calculated as LTM adjusted EBITDA divided by LTM interest expense. ($900.0 million / $100.0 million)

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e. 7.0x. (EBITDA – Capex)-to- interest expense is calculated as LTM adjusted EBITDA less capex divided by LTM interest expense. (($900.0 million – $205.0 million) / $100.0 million)

f. 7.3x. EBIT-to-interest expense is calculated as LTM adjusted EBIT divided by LTM interest expense. ($725.0 million / $100.0 million)

6) Trading multiples

($ in millions, except per share data)

Trading Multiples

	LTM 9/30/2019	NFY 2019E	NFY+1 2020E	NFY+2 2021E
EV / Sales	**1.4x**	1.4x	1.3x	1.2x
Metric	$4,725.0	$5,000.0	$5,350.0	$5,625.0
EV / EBITDA	7.5x	7.1x	6.6x	6.3x
Metric	$900.0	$950.0	$1,025.0	$1,075.0
EV / EBIT	9.3x	8.8x	8.2x	7.8x
Metric	$725.0	$765.0	$825.0	$865.0
P/E	10.7x	9.8x	9.1x	8.7x
Metric	$4.69	$5.10	$5.50	$5.75
FCF Yield	*6.3%*	*7.5%*	*8.3%*	*9.1%*
Metric	$315.0	$375.0	$415.0	$455.0

= Enterprise Value / LTM Sales
= $6,750.0 million / $4,725.0 million

= Current Share Price / 2021E EPS
= $50.00 / $5.75

= Enterprise Value / 2019E EBITDA
= $6,750.0 million / $950.0 million

= Enterprise Value / 2020E EBIT
= $6,750.0 million / $825.0 million

= 2021E Free Cash Flow / Equity Value
= $455.0 million / $5,000.0 million

a. 1.4x. Enterprise value-to-LTM sales is calculated as enterprise value divided by LTM sales. ($6,750.0 million / $4,750.0 million)

b. 7.1x. Enterprise value-to-NFY EBITDA is calculated as enterprise value divided by 2019E EBITDA. ($6,750.0 million / $950.0 million)

c. 8.2x. Enterprise value-to-NFY+1 EBIT is calculated as enterprise value divided by 2020E EBIT. ($6,750.0 million / $825.0 million)

d. 8.7x. Price/NFY+2 EPS is calculated as the current share price divided by 2021E EPS. ($50.00 / $5.75)

e. 9.1%. FCF Yield (NFY+2 Free cash flow-to-equity value) is calculated as 2021E Free cash flow divided by equity value. ($455.0 million / $5,000.0 million)

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7) Growth rates

= (2020E EPS / 2018 Adjusted EPS) ^ (1 / (2020E - 2018)) - 1
= ($5.50 / $4.10) ^ (1 / 2) - 1

= 2019E FCF / 2018 FCF - 1
= $375.0 million / $300.0 million - 1

Growth Rates	Sales	EBITDA	FCF	EPS
Historical				
1-year ('17-'18)	*8.4%*	*5.1%*	*13.2%*	*6.4%*
2-year CAGR ('16-'18)	*9.5%*	*8.2%*	*14.2%*	*11.6%*
Estimated				
1-year ('18-'19E)	*11.1%*	*15.2%*	*25.0%*	*24.1%*
2-year CAGR ('18-'20E)	*9.0%*	*11.5%*	*17.6%*	*15.7%*

= 2018 Sales / 2017 Sales - 1
= $4,500.0 million / $4,150.0 million - 1

= (2018 Adjusted EBITDA / 2016 EBITDA) ^ (1 / (2018 - 2016)) - 1
= ($825.0 million / $705.0 million) ^ (1 / 2) - 1

a. 8.4%. One year historical sales growth is calculated as 2018A sales divided by 2017A sales, minus one. ($4,500 million / $4,150 million – 1)

b. 8.2%. Two year historical EBITDA CAGR is calculated using the following formula: ((2018A Adjusted EBITDA / 2016A EBITDA) ^ (1 / (2018A – 2016A)) – 1). (($825.0 million / $705.0 million) ^ (1 / 2) – 1)

c. 25.0%. One year estimated FCF growth is calculated as 2019E FCF divided by 2018A FCF, minus one. ($375.0 million / $300.0 million – 1)

d. 15.7%. Two year estimated EPS CAGR is calculated using the following formula: ((2020E EPS / 2018A Adjusted EPS) ^ (1 / (2020E – 2018A)) – 1) (($5.50 / $4.10) ^ (1 / 2) – 1)

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8) Benchmarking financial statistics and profitability ratios

= EBIT / Sales
= $624.5 million / $4,284.5 million

= EBITDA / Sales
= $1,047.0 million / $5,894.6 million

= Gross Profit / Sales
= $2,328.7 million / $6,559.6 million

($ in millions, except per share data)

	LTM Financial Statistics					LTM Profitability Margins			
Company	**Sales**	**Gross Profit**	**EBITDA**	**EBIT**	**Net Income**	**Gross Profit (%)**	**EBITDA (%)**	**EBIT (%)**	**Net Income (%)**
BuyerCo	$6,559.6	$2,328.7	$1,443.1	$1,279.1	$852.5	36%	22%	20%	13%
Sherman Co.	5,894.6	1,945.2	1,047.0	752.2	507.2	33%	18%	13%	9%
Pearl Corp.	4,284.5	1,585.3	838.7	624.5	393.4	37%	20%	15%	9%
Gasparro Corp.	4,725.0	1,680.0	900.0	725.0	468.8	36%	19%	15%	10%
Kumra Inc.	3,186.7	922.4	665.3	505.9	306.4	29%	21%	16%	10%
Mean						**34%**	**20%**	**16%**	**10%**
Median						**36%**	**20%**	**15%**	**10%**

= Average (BuyerCo EBITDA % : Kumra Inc. EBITDA %)
= Average (22% : 21%)

= Median (BuyerCo EBIT % : Kumra Inc. EBIT %)
= Median (20% : 16%)

= Net Income / Sales
= $248.4 million / $3,186.7 million

a. 35.5%. Gross profit margin is calculated as gross profit divided by sales. ($2,328.7 million / $6,559.6 million)

b. 17.8%. EBITDA margin is calculated as EBITDA divided by sales. ($1,047.0 million / $5,894.6 million)

c. 14.6%. EBIT margin is calculated as EBIT divided by sales. ($624.5 million / $4,284.5 million)

d. 9.6%. Net income margin is calculated as net income divided by sales. ($306.4 million / $3,186.7 million)

e. 19.9%. The mean EBITDA margin for the comparable companies is calculated by taking the average of the EBITDA margins for the comparable companies

f. 15.3%. The median EBIT margin for the comparable companies is calculated by taking the median of the EBIT margins for the comparable companies

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9) Benchmarking leverage and coverage ratios

= EBITDA / Interest Expense
= $665.3 million / $60.3 million

= (Total Debt - Cash) / EBITDA
= ($1,500.0 million - $868.1 million) / $838.7 million

= Total Debt / EBITDA
= $3,150.0 million / $1,047.0 million

= Total Debt / (Total Debt + Shareholders' Equity)
= $2,200.0 million / ($2,200.0 million + $2,480.0 million)

($ in millions, except per share data)

	LTM Leverage Ratios			LTM Coverage Ratios		
Company	**Debt / Tot. Cap. (%)**	**Debt / EBITDA (x)**	**Net Debt / EBITDA (x)**	**EBITDA / Int. Exp. (x)**	**EBITDA - Cpx/ Int. (x)**	**EBIT / Int. Exp. (x)**
BuyerCo	47%	1.5x	1.2x	10.1x	8.8x	9.0x
Sherman Co.	57%	3.0x	2.4x	13.8x	10.7x	9.9x
Pearl Corp.	37%	1.8x	0.8x	8.4x	7.1x	6.2x
Gasparro Corp.	52%	2.1x	1.9x	9.0x	7.0x	7.3x
Kumra Inc.	25%	1.3x	0.6x	11.0x	8.7x	8.4x
Mean	**44%**	**1.9x**	**1.4x**	**10.5x**	**8.4x**	**8.2x**
Median	**47%**	**1.8x**	**1.2x**	**10.1x**	**8.7x**	**8.4x**

= Average (BuyerCo Debt / EBITDA : Kumra Inc. Debt / EBITDA)
= Average (1.5x : 1.3x)

= Median (BuyerCo EBITDA / Int. Exp. : Kumra Inc. EBITDA / Int. Exp.)
= Median (10.1x : 11.0x)

= (EBITDA - Capex) / Interest Expense
= ($665.3 million - $143.4 million) / $60.3 million

= EBIT / Interest Expense
= $505.9 million / $60.3 million

a. 47.0%. Debt-to-total capital is calculated as total debt divided by debt plus market capitalization ($2,200.0 million / ($2,200.0 million + $2,480.0 million))

b. 3.0x. Debt-to-EBTIDA is calculated as total debt divided by EBITDA. ($3,150.0 million / $1,047.0 million)

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c. 0.8x. Net debt-to-EBITDA is calculated as total debt minus cash divided by EBTIDA. (($1,500.0 million – $868.1 million) / $838.7 million)

d. 11.0x. EBITDA-to-interest expense is calculated as EBITDA divided by interest expense. ($665.3 million / $60.3 million)

e. 8.7x. (EBITDA – Capex)-to-interest expense is calculated as EBITDA minus capital expenditures divided by interest expense. (($665.3 million – $143.4 million) / $60.3 million)

f. 8.4x. EBIT-to-interest expense is calculated as EBIT divided by interest expense. ($505.9 million / $60.3 million)

g. 1.9x. The mean Debt-to-EBITDA ratio for the comparable companies is calculated by taking the average of the Debt-to-EBITDA ratios for the comparable companies

h. 10.1x. The median EBITDA-to-interest expense ratio for the comparable companies is calculated by taking the median of the EBITDA-to-interest expense ratios for the comparable companies

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10) Comparable companies analysis

= Enterprise value / LTM EBIT
= $5,803.7 million / $624.5 million

= Enterprise value / LTM EBITDA
= $8,101.0 million / $1,047.0 million

= Enterprise value / LTM sales
= $11,600.0 million / $6,559.6 million

= Current Share Price / LTM EPS
= $52.50 / $3.33

Company	Current Share Price	Equity Value	Enterprise Value	Enterprise Value / LTM Sales	Enterprise Value / LTM EBITDA	Enterprise Value / LTM EBIT	Price / LTM EPS
BuyerCo	$70.00	$9,800.0	$11,600.0	1.8x	8.0x	9.1x	11.5x
Sherman Co.	40.00	5,600.0	8,101.0	1.4x	7.7x	10.8x	11.0x
Pearl Corp.	68.50	5,171.8	5,803.7	1.4x	6.9x	9.3x	13.1x
Gasparro Corp.	50.00	5,000.0	6,750.0	1.4x	7.5x	9.3x	10.7x
Kumra Inc.	52.50	4,851.6	5,344.6	1.7x	8.0x	10.6x	15.8x
Mean				**1.5x**	**7.6x**	**9.8x**	**12.4x**
Median				**1.4x**	**7.7x**	**9.3x**	**11.5x**

= Average (BuyerCo Enterprise value / LTM EBITDA
: Kumra Inc. Enterprise value / LTM EBITDA)
= Average (8.0x : 8.0x)

= Median (BuyerCo Price / LTM EPS
: Kumra Inc. Price / LTM EPS)
= Median (11.5x : 15.8x)

a. 1.8x. Enterprise value-to-LTM sales is calculated as enterprise value divided by LTM sales. ($11,600.0 million / $6,559.6 million)

b. 7.7x. Enterprise value-to-LTM EBITDA is calculated as enterprise value divided by LTM EBITDA. ($8,101.0 mill ion / $1,047.0 million)

c. 9.3x. Enterprise value-to-LTM EBIT is calculated as enterprise value divided by LTM EBIT. ($5,803.7 million / $624.5 million)

d. 15.8x. Price-to-LTM EPS is calculated as the current share price divided by LTM EPS. ($52.50 / $3.33)

e. 7.6x. The mean Enterprise value-to-LTM EBITDA multiple for the comparable companies is calculated by taking the average of the Enterprise value-to-LTM EBITDA multiples for the comparable companies

f. 11.5x. The median price-to-LTM EPS multiple for the comparable companies is calculated by taking the median of the price-to-LTM EPS multiples for the comparable companies.

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11) Implied valuation ranges using LTM EBITDA

= LTM EBITDA x High EBITDA Multiple Range
= $700 million x 8.0x

= LTM EBITDA x Low EBITDA Multiple Range
= $700 million x 7.0x

($ in millions, except per share data)

EBITDA	Financial Metric	Multiple Range		Implied Enterprise Value		Less: Net Debt	Implied Equity Value		Fully Diluted Shares	Implied Share Price	
LTM	$700	7.0x	– 8.0x	$4,900	– $5,600	(1,500)	$3,400	– $4,100	80	$42.50	– $51.25

= Low Implied Enterprise Value - Net Debt
= $4,900 million - $1,500 million

= High Implied Enterprise Value - Net Debt
= $5,600 million - $1,500 million

= Low Implied Equity Value / Fully Diluted Shares
= $3,400 million / 80 million

= High Implied Equity Value / Fully Diluted Shares
= $4,100 million / 80 million

a. $4,900 million. Low implied enterprise value is calculated as LTM EBITDA multiplied by the low EBITDA multiple range. ($700 million x 7.0x)

   $5,600 million, High implied enterprise value is calculated as LTM EBITDA multiplied by the high EBITDA multiple range. ($700.million x 8.0x)

b. $3,400 million. Low implied equity value is calculated as low implied enterprise value minus net debt. ($4,900 million - $1,500 million)

   $4,100 million High implied equity value is calculated as high implied enterprise value minus net debt. ($5,600.0 million - $1,500 million)

c. $42.50. Low implied share price is calculated as low implied equity value divided by fully diluted shares. ($3,400 million / 80 million)

   $51.25. High implied share price is calculated as high implied equity value divided by fully diluted shares. ($4,100 million / 80 million

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12) Implied valuation range using LTM net income

= LTM Net income x High P/E Multiple Range
= $300 million x 13.0x

= LTM Net income x Low P/E Multiple Range
= $300 million x 11.0x

($ in millions, except per share data)

Net Income	Financial Metric	Multiple Range			Implied Equity Value			Fully Diluted Shares	Implied Share Price		
LTM	$300	11.0x	–	13.0x	$3,300	–	$3,900	80	$41.25	–	$48.75

= Low Implied Equity Value / Fully Diluted Shares
= $3,300 million / 80 million

= High Implied Equity Value / Fully Diluted Shares
= $3,900 million / 80 million

a. $3,300 million. Low implied equity value is calculated as LTM net income multiplied by the low P/E multiple range. ($300 million x 11.0x)

$3,900 million. High implied equity value is calculated as LTM net income multiplied by the high P/E multiple range. ($300 million x 13.0x)

b. $41.25. Low implied share price is calculated as low implied equity value divided by fully diluted shares. ($3,300 million / 80 million shares)

$48.75. High implied share price is calculated as high implied equity value divided by fully diluted shares. ($3,900 million / 80 million shares)

13) A. The correct order is:

I. Select the Universe of Comparable Companies
II. Locate the Necessary Financial Information
III. Spread Key Statistics, Ratios, and Trading Multiples
IV. Benchmark the Comparable Companies
V. Determine Valuation

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14) C. Although all four characteristics can be used to determine the universe of comparable companies, return on investment is a financial characteristic, not a business characteristic

Business Profile
▪ Sector ▪ Products and Services ▪ Customers and End Markets ▪ Distribution Channels ▪ Geography

15) D. Although all four characteristics can be used to determine the universe of comparable companies, geography is a business characteristic, not a financial characteristic

Financial Profile
▪ Size ▪ Profitability ▪ Growth Profile ▪ Return on Investment ▪ Credit Profile

16) C. Sector, end markets and distribution channels are key business characteristics to examine when screening for comparable companies

17) B. Profitability, growth profile, and credit profile are key financial characteristics to examine when screening for comparable companies

18) A. A company's end markets refer to the broad underlying markets into which it sells its products and services. For example, a plastics manufacturer may sell into several end markets, including automotive, construction, consumer products, medical devices, and packaging. End markets need to be distinguished from customers. For example, a company may sell into the housing end market, but to retailers or suppliers as opposed to homebuilders.

19) B. Distribution channels are the mediums through which a company sells its products and services to the end user. Companies that sell primarily to the wholesale channel, for example, often have significantly different organizational

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and cost structures than those selling directly to retailers or end users. Selling to a superstore or value retailer requires a physical infrastructure, sales force, and logistics that may be unnecessary for serving the professional or wholesale channels. Some companies sell at several levels of the distribution chain, such as wholesale, retail, and direct-to-customer.

20) D. In addition to gross profit, EBITDA margin, and EBIT margin, net income margin can also be used to determine the profitability of a company.

21) B. A Schedule 13-D is required when an investor, or group of investors, acquires more than 5% of a company's shares. A Schedule 13-D does not contain relevant financial information for comparable companies.

22) B. Fully diluted shares outstanding are calculated as basic shares outstanding + "in-the-money" options and warrants + "in-the-money" convertible securities. Only "in-the-money" options, warrants and convertible securities are included in the calculation for comparable companies analysis.

23) A. The incremental shares represented by a company's "in-the-money" options and warrants are calculated in accordance with the treasury stock method (TSM). "In-the-money" convertible and equity-linked securities are calculated in accordance with the "if-converted method" or net share settlement (NSS), where appropriate.

24) A. Equity value ("market capitalization") is the value represented by a given company's basic shares outstanding plus "in-the-money" stock options warrants, and convertible securities—collectively, "fully diluted shares outstanding." Enterprise value ("total enterprise value" or "firm value") is the sum of all ownership interests in a company and claims on its assets from both debt and equity holders. It is defined as equity value + total debt + preferred stock + noncontrolling interest – cash and cash equivalents.

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= Current Share Price x Fully Diluted Shares
= $20.00 x 50.0 million

($ in millions)

Calculation of Enterprise Value	
Equity Value	$1,000.0
Plus: Total Debt	250.0
Plus: Preferred Stock	35.0
Plus: Noncontrolling Interest	15.0
Less: Cash and Cash Equivalents	(50.0)
Enterprise Value	**$1,250.0**

= Equity Value + Total Debt + Preferred Stock
+ Noncontrolling Interest - Cash and Cash Equivalents
= $1,000.0 million + $250.0 million + $35.0 million +
$15.0 million - $50.00 million

25) C. As shown below, the 20 million options are in-the-money as the exercise price of $10.00 is lower than the current share price of $25.00. This means that the holders of the options have the right to buy the company's shares at $10.00 and sell them at $25.00, thereby realizing the $15.00 differential. Under the TSM, it is assumed that the $10.00 of potential proceeds received by the company is used to repurchase shares that are currently trading at $25.00. Therefore, the number of shares repurchased is 8 million. To calculate net new shares, the 8 million shares repurchased are subtracted from the 20 million options, resulting in 12 million. These new shares are added to the company's basic shares outstanding to derive fully diluted shares of 212.0 million.

($ in millions, except per share data; shares in millions)

Calculation of Fully Diluted Shares Using the TSM	
Options Proceeds	$200.0
/ Current Share Price	$25.00
Shares Repurchased from Option Proceeds	8.0
Shares from In-the-Money Options	20.0
Less: Shares Repurchased from Option Proceeds	(8.0)
Net New Shares from Options	12.0
Plus: Basic Shares Outstanding	200.0
Fully Diluted Shares Outstanding	212.0

= Exercisable Options x Exercise Price
= 20.0 million x $10.00

= Option Proceeds / Current Share Price
= $200.0 million / $25.00

Current Share Price of $25.00 > $10.00 Exercise Price

= In-the-Money Options - Shares Repurchased
= 20.0 million - 8.0 million

= Net New Shares from Options + Basic Shares Outstanding
= 12.0 million + 200.0 million

26) C. See calculation below:

($ in millions, except per share data; shares in millions)

Calculation of Fully Diluted Shares Using the TSM	
Options Proceeds	$260.0
/ Current Share Price	$40.00
Shares Repurchased from Option Proceeds	6.5
Shares from In-the-Money Options	10.0
Less: Shares Repurchased from Option Proceeds	(6.5)
Net New Shares from Options	3.5
Plus: Basic Shares Outstanding	300.0
Fully Diluted Shares Outstanding	303.5

= Exercisable Options x Exercise Price
= 10.0 million x $26.00

= Option Proceeds / Current Share Price
= $260.0 million / $40.00

Current Share Price of $40.00 > $26.00 Exercise Price

= In-the-Money Options - Shares Repurchased
= 10.0 million - 6.5 million

= Net New Shares from Options + Basic Shares Outstanding
= 3.5 million + 300.0 million

27) D. Net debt is subtracted from enterprise value to calculate implied equity value.

28) A. The most dilutive scenario would be to use all outstanding options and warrants.

29) C. Stock options become eligible to be converted into shares of common stock once their vesting period expires ("exercisable").

30) C. As the company's current share price of $45.00 is greater than the conversion price of $30.00, the $300 million convert is in-the-money. Therefore, the convert's amount outstanding is divided by the conversion price to calculate new shares of 10 million ($300 million / $30.00). The new shares from conversion are then added to the company's basic shares outstanding of 250 million to calculate fully diluted shares outstanding of 260 million.

= Amount Outstanding / Converstion Price
= $300.0 million / $30.00

($ in millions, except per share data; shares in millions)

If-Converted Method	
Amount Outstanding	$300.0
/ Conversion Price	$30.00
Incremental Shares	**10.0**
Plus: Basic Shares Outstanding	250.0
Fully Diluted Shares Outstanding	**260.0**

= New Shares from Conversion + Basic Shares Outstanding
= 10.0 million + 250.0 million

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31) D. See calculation below:

($ in millions, except per share data; shares in millions)

Calculation of Fully Diluted Shares Using the TSM	
Options Proceeds	$150.0
/ Current Share Price	$30.00
Shares Repurchased from Option Proceeds	**5.0**
Shares from In-the-Money Options	10.0
Less: Shares Repurchased from Option Proceeds	(5.0)
Net New Shares from Options	**5.0**

= Exercisable Options x Exercise Price
= 10.0 million x $15.00

= Option Proceeds / Current Share Price
= $150.0 million / $30.00

Current Share Price of $30.00 > $15.00 Exercise Price of Options

= In-the-Money Options - Shares Repurchased
= 10.0 million - 5.0 million

If-Converted Method	
Amount Outstanding	$250.0
/ Conversion Price	$20.00
Incremental Shares	**12.5**
Plus: Net New Shares from Options	5.0
Plus: Basic Shares Outstanding	350.0
Fully Diluted Shares Outstanding	**367.5**

= Amount Outstanding / Conversion Price
= $250.0 million / $20.0

Calculated from TSM

= New Shares from Conversion
+ Net New Shares from Options
+ Basic Shares Outstanding
= 12.5 million + 5.0 million + 350.0 million

32) C. See calculation below:

($ in millions, except per share data; shares in millions)

If-Converted Method	
Amount Outstanding	$225.0
/ Conversion Price	$22.50
Incremental Shares	**10.0**

33) A. The net share settlement method ("NSS") calculation is performed by first multiplying the number of underlying shares in the convert of 10 million by the company's current share price of $30.00 to determine the implied conversion value of $300 million. The $75 million spread between the conversion value and par ($300 million − $225 million) is then divided by the current share price to determine the number of incremental shares from conversion of 2.5 million ($75 million / $30.00).

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($ in millions, except per share data; shares in millions)

Net Share Settlement	
Amount Outstanding	$225.0
/ Conversion Price	$22.50
Incremental Shares	**10.0**
x Current Share Price	$30.00
Total Conversion Value	**$300.0**
Less: Par Value of Amount Outstanding	(225.0)
Excess Over Par Value	**$75.0**
/ Current Share Price	$30.00
Incremental Shares – NSS	**2.5**

= Excess Over Par Value / Current Share Price
= $50.0 million / $20.00

= Total Conversion Value - Par Value of Amt. Out.
= $200.0 million - $150.0 million

= Incremental Shares x Current Share Price
= 10.0 million x $20.00

= Amount Outstanding / Conversion Price
= $150.0 million / $15.00

34) B. The formula for enterprise value is equity value + total debt + preferred stock + noncontrolling interest – cash.

35) A. As enterprise value is independent of capital structure, it remains constant regardless of changes in capital structure.

36) If a company issues equity and uses the proceeds to repay debt, the incremental equity value is offset by the decrease in debt on a dollar-for-dollar basis.

($ in millions)

Capital Structure	Actual 2018	Adjustments +	Adjustments -	Pro forma 2018
Equity Value	$1,200.0	200.0		$1,400.0
Plus: Total Debt	750.0		(200.0)	550.0
Plus: Preferred Stock	100.0			100.0
Plus: Minority Interest	50.0			50.0
Less: Cash and Cash Equivalents	(100.0)			(100.0)
Enterprise Value	**$2,000.0**			**$2,000.0**

37) B. The gross profit margin for Company B is 45.0% while Company A has a gross profit margin of 37.5%. The calculation for gross profit margin is shown below.

$$\text{Gross Profit Margin} = \frac{\text{Gross Profit (Sales – COGS)}}{\text{Sales}}$$

38) A. See calculation below:

	Fiscal Year Ending December 31,						
	2016A	2017A	2018A	CAGR ('16 - '18)	2019E	2020E	CAGR ('18 - '20)
Diluted EPS	$1.35	$1.60	$1.80	*15.5%*	$2.00	$2.20	*10.6%*
% growth		*18.5%*	*12.5%*		*11.1%*	*10.0%*	

= (Ending Value / Beginning Value) ^ (1 / Ending Year - Beginning Year) - 1
= ($1.80 / $1.35) ^ (1 / (2018 - 2016)) - 1

= (Ending Value / Beginning Value) ^ (1 / Ending Year - Beginning Year) - 1
= ($2.20 / $1.80) ^ (1 / (2020 - 2018)) - 1

39) C. In assessing a company's growth profile, historical and estimated future growth rates for various financial statistics (e.g., sales, EBITDA, and earnings per share (EPS)) are examined at selected intervals. EBITDA margin, which measures a company's operating profitability, is not used to measure growth.

40) B. As shown below, return on invested capital (ROIC) utilizes a pre-interest earnings statistic in the numerator, such as EBIT, and a metric that captures both debt and equity in the denominator.

$$\text{ROIC} = \frac{\text{EBIT}}{\text{Average Net Debt + Equity}}$$

41) C. Return on equity (ROE) incorporates an earnings metric net of interest expense, such as net income, in the numerator and average shareholders' equity in the denominator. The calculation for ROE is shown below.

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Average Shareholders' Equity}}$$

42) C. As shown below, return on assets (ROA) utilizes net income in the numerator and average total assets in the denominator.

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$$\text{Return on Assets} = \frac{\text{Net Income}}{\text{Average Total Assets}}$$

43) A. Debt-to-total capitalization measures a company's debt as a percentage of its total capitalization (debt + preferred stock + noncontrolling interest + equity). The formula for debt-to-total capitalization is shown below.

$$\text{Debt-to-Total Capitalization} = \frac{\text{Debt}}{\text{Debt + Preferred Stock + Noncontrolling Interest + Equity}}$$

44) A. The numerator in an interest coverage ratio can be comprised of EBITDA, (EBITDA – Capex), or EBIT, which are all financial statistics representing an operating cash flow metric. Net income does not fit this characteristic because it is net of interest expense and taxes.

$$\text{Interest Coverage Ratio} = \frac{\text{EBITDA, (EBITDA – Capex), or EBIT}}{\text{Interest Expense}}$$

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45) B. As the graphic below shows, Aaa, Aa1, and Aa2 are credit ratings assigned by Moody's.

	Moody's	S&P	Fitch	Definition
Investment Grade	**Aaa**	AAA	AAA	Highest Quality
	Aa1	AA+	AA+	
	Aa2	AA	AA	Very High Quality
	Aa3	AA-	AA-	
	A1	A+	A+	
	A2	A	A	High Quality
	A3	A-	A-	
	Baa1	BBB+	BBB+	
	Baa2	BBB	BBB	Medium Grade
	Baa3	BBB-	BBB-	
Non-Investment Grade	Ba1	BB+	BB+	
	Ba2	BB	BB	Speculative
	Ba3	BB-	BB-	
	B1	B+	B+	
	B2	B	B	Highly Speculative
	B3	B-	B-	
	Caa1	CCC+	CCC+	
	Caa2	CCC	CCC	Substantial Risk
	Caa3	CCC-	CCC-	
	Ca	CC	CC	
	C	C	C	Extremely Speculative /
	-	D	D	Default

46) D. BBB- is investment grade (see table in question #44).

47) A. The equivalent of B+ is B1 (see table in question #44).

48) D. LTM 9/30/2019 sales are calculated by taking $2,250.0 million (2018 FY Sales from 10-K), adding $1,600.0 million (2019 3Q YTD Sales from 10-Q), and then subtracting $1,450.0 million (2018 3Q YTD Sales from 10-Q).

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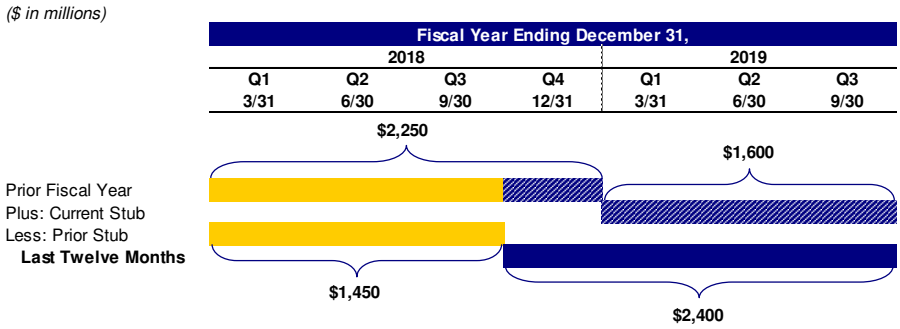
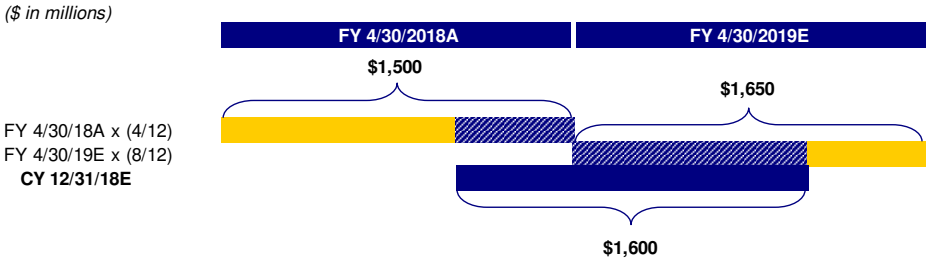


49) B. In this case, the most recent quarter is the fourth quarter of the company's fiscal year. Therefore, there is no LTM calculation as the full prior fiscal year (as reported) serves as the LTM period.

50) C. To calendarize 4/30/2018 sales, take year end 4/30/2018 sales and multiply the data by 4/12, the numerator pertaining to the month # in which the company's fiscal year ends. Next, take 4/30/2019 projected sales, and multiple the data by 8/12, the numerator pertaining to one minus the month # in which the company's fiscal year ends. The sum of these two formulas is estimated 12/31/2018 sales.

$$\text{Next Calendar Year (CY) Sales} = \frac{(\text{Month \#}) \times (\text{FYA Sales})}{12} + \frac{(12 - \text{Month \#}) \times (\text{NFY Sales})}{12}$$

Note: "Month #" refers to the month in which the company's fiscal year ends (e.g. the Month # for a company with a fiscal year ending April 30 would be 4). FYA = fiscal year actual and NFY = next fiscal year.



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51) B. See calculation below

($ in millions, except per share data)

Income Statement	Reported 2018	Adjustments +	Adjustments -	Adjusted 2018
Sales	**$1,000.0**			**$1,000.0**
Cost of Goods Sold	625.0		(5.0)	620.0
Gross Profit	**$375.0**			**$380.0**
Selling, General & Administrative	230.0			230.0
Restructuring Charges	10.0		(10.0)	-
Operating Income (EBIT)	**$135.0**			**$150.0**
Interest Expense	35.0			35.0
Pre-tax Income	**$100.0**			**$115.0**
Income Taxes @ 25%	25.0	3.8		28.8
Net Income	**$75.0**			**$86.3**
Operating Income (EBIT)	$135.0	15.0		$150.0
Depreciation & Amortization	50.0			50.0
EBITDA	**$185.0**			**$200.0**
Weighted Avg. Diluted Shares	30.0			30.0
Diluted EPS	$2.50			$2.88

Inventory write-down

= (Inventory write-down + Restructuring charge) x Marginal Tax Rate
= ($5 million + $10 million) x 25%

$15 million add-back of total non-recurring items

52) A. P/E is equal to equity value/net income.

$$\frac{\text{Share Price}}{\text{Diluted EPS}} \qquad \frac{\text{Equity Value}}{\text{Net Income}}$$

53) C. For enterprise value multiples, the denominator employs a financial statistic that flows to both debt and equity holders, such as sales, EBITDA, and EBIT. Thus, Enterprise value/net income is incorrect because net income only flows to equity holders as it is net of interest expense.

54) A. Equity value-to-EBITDA is incorrect because its numerator, equity value, corresponds to a financial statistic that flows only to equity holders, such as net income or EPS. EBITDA flows to both equity and debt holders.

55) B. The balance sheet shows the cumulative amount of noncontrolling interest.

56) B. Enterprise value-to-EBITDA and Price-to-earnings (P/E) are the two most generic and widely used valuation multiples.

57) Similar companies provide a highly relevant reference point for valuing a given target due to the fact that they share key business and financial characteristics, performance drivers, and risks.

58) One of the companies could have higher profit margins, higher levels of projected growth, or less leverage; while the other company could have experienced management turnover, missed earnings estimates, or lost a major distributor.

59) Moderate to low leverage. Such a company has a lower risk of financial distress, coupled with a greater ability to grow both organically and through acquisitions.

60) Certain sub-groups are typically more appropriate than the entire universe for framing valuation (e.g., based on business model, size, and geography). This tiering requires a sufficient number of comparable companies to justify categorization.

61) See below

10-K	Annual report
10-Q	Quarterly report
8-K	Current report
DEF14A	Proxy statement

62) See below

Enterprise value/reserves	Metals & mining
Enterprise value/EBITDAR	Retail
Enterprise value/subscriber	Media
Price/Book	Financial Institutions

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63) Benefits of using comparable companies:

- *Market-based* – information used to derive valuation for the target is based on actual public market data, thereby reflecting the market's growth and risk expectations, as well as overall sentiment
- *Relativity* – easily measurable and comparable versus other companies
- *Quick and convenient* – valuation can be determined on the basis of a few easy-to-calculate inputs
- *Current* – valuation is based on prevailing market data, which can be updated on a daily (or intraday) basis

64) Considerations when using comparable companies::

- *Market-based* – valuation that is completely market-based can be skewed during periods of irrational exuberance or bearishness
- *Absence of relevant comparables* – "pure play" comparables may be difficult to identify or even non-existent, especially if the target operates in a niche sector, in which case the valuation implied by trading comps may be less meaningful
- *Potential disconnect from cash flow* – valuation based on prevailing market conditions or expectations may have significant disconnect from the valuation implied by a company's projected cash flow generation (e.g., DCF analysis)
- *Company-specific issues* – valuation of the target is based on the valuation of other companies, which may fail to capture target-specific strengths, weaknesses, opportunities, and risks

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CHAPTER 2 ANSWERS AND RATIONALE

1) Calculation of fully diluted shares outstanding

= Net New Shares From Options + Basic Shares Outstanding
= 2.000 million + 123.00 million

= Shares from In-the-Money Options - Shares Repurchased
= 3.750 million - 1.750 million

= Total Option Proceeds / Current Share Price
= $35.0 million / $20.00

= Total In-the-Money Shares

($ in millions, except per share data)

Calculation of Fully Diluted Shares Outstanding	
Basic Shares Outstanding	123.000
Plus: Shares from In-the-Money Options	3.750
Less: Shares Repurchased from Option Proceeds	(1.750)
Net New Shares from Options	**2.000**
Plus: Shares from Convertible Securities	-
Fully Diluted Shares Outstanding	**125.000**

Options/Warrants

Tranche	Number of Shares	Exercise Price	In-the-Money Shares	Proceeds
Tranche 1	1.500	$5.00	1.500	$7.5
Tranche 2	1.250	10.00	1.250	12.5
Tranche 3	1.000	15.00	1.000	15.0
Tranche 4	-	-	-	-
Tranche 5	-	-	-	-
Total	**3.750**		**3.750**	**$35.0**

= Tranche 1 In-the-Money Shares
+ Tranche 2 In-the-Money Shares
+ Tranche 3 In-the-Money Shares
= 1.500 million + 1.250 million + 1.000 million

= IF(Weighted Average Strike Price < Current Share Price, display Number of Shares, otherwise display 0)
= IF($5.00 < $20.00, 1.500, 0)

= Tranche 1 In-the-Money Proceeds
+ Tranche 2 In-the-Money Proceeds
+ Tranche 3 In-the-Money Proceeds
= $7.5 million + $12.5 million + $15.0 million

= IF(In-the-Money Shares > 0, then In-the-Money Shares x Weighted Average Strike Price, otherwise display 0)
= IF(1.500 > 0, 1.500 x $5.00, 0)

a. 3.75 million. The total number of Rosenbaum Industries' in-the-money options/warrants is calculated by adding the in-the-money shares from the tranches that have an exercise price lower than the current share price of $20.00. (1.500 million shares + 1.250 million shares + 1.000 million shares)

b. $35.0 million. The total proceeds from in-the-money options/warrants is calculated by adding the proceeds from the tranches which have an exercise price lower than the current share price of $20.00. ($7.5 million + $12.5 million + $15.0 million)

c. 2.00 million. Under the TSM, it is assumed that the $35.0 million is used to repurchase shares that are currently trading at $20.00. Therefore, the number of shares repurchased is 2.00 million ($35.0 million / $20.00). To calculate net new shares, the shares repurchased are subtracted from the total number of in-the-money options/warrants. (3.75 million shares – 1.75 million shares)

d. 125.0 million. Fully diluted shares are calculated as net new shares plus basic shares outstanding. (123.0 million shares + 2.00 million shares)

2) Calculation of equity value and enterprise value

($ in millions, except per share data; shares in millions)

Calculation of Equity and Enterprise Value		
Offer Price per Share		
Cash Offer Price per Share		$20.00
Stock Offer Price per Share		-
Exchange Ratio	-	
Pearl Corp. Share Price	-	
Offer Price per Share		**$20.00**
Fully Diluted Shares Outstanding		125.000
Implied Equity Value		**$2,500.0**
Implied Enterprise Value		
Plus: Total Debt		1,375.0
Plus: Preferred Stock		-
Plus: Noncontrolling Interest		-
Less: Cash and Cash Equivalents		(50.0)
Implied Enterprise Value		**$3,825.0**

= Equity Value + Total Debt - Cash
= $2,500.0 million + $1,375.0 million - $50.0 million

= Offer Price per Price x Fully Diluted Shares Outstanding
= $20.00 x 125.0 million

a. $2,500.0 million. Equity value is calculated by multiplying fully diluted shares outstanding by the offer price per share price. (125.0 million shares x $20.00)

b. $3,825.0 million. Enterprise value is calculated as equity value plus total debt minus cash and cash equivalents. ($2,500.0 million + $1,375.0 million – $50.0 million)

3) Adjusting for one-time and non-recurring items

EBIT$_{2018}$ + EBIT$_{9/30/2019\ Current\ Stub}$ - EBIT$_{9/30/2018\ Prior\ Stub}$
= $300.0 million + $206.3 million - $222.8 million

Gross Profit$_{2018}$ + Gross Profit$_{9/30/2019\ Current\ Stub}$ - Gross Profit$_{9/30/2018\ Prior\ Stub}$
= $725.0 million + $543.8 million - $587.3 million

Litigation Settlement

($ in millions, except per share data)

Adjusted Income Statement

	FYE 12/31/2018	Prior Stub 9/30/2018	Current Stub 9/30/2019	LTM 9/30/2019
Reported Gross Profit	$725.0	$543.8	$587.3	$768.5
Non-recurring Items in COGS	-	-	-	-
Adjusted Gross Profit	**$725.0**	**$543.8**	**$587.3**	**$768.5**
% margin	*32.2%*	*32.2%*	*32.2%*	*32.2%*
Reported EBIT	$275.0	$206.3	$222.8	291.5
Non-recurring Items in COGS	-	-	-	-
Other Non-recurring Items	25.0	-	-	25.0
Adjusted EBIT	**$300.0**	**$206.3**	**$222.8**	**$316.5**
% margin	*13.3%*	*12.2%*	*12.2%*	*13.3%*
Depreciation & Amortization	100.0	75.0	82.0	107.0
Adjusted EBITDA	**$400.0**	**$281.3**	**$304.8**	**$423.5**
% margin	*17.8%*	*16.7%*	*16.7%*	*17.8%*
Reported Net Income	$131.3	$98.4	$110.8	143.6
Non-recurring Items in COGS	-	-	-	-
Other Non-recurring Items	25.0	-	-	25.0
Non-operating Non-rec. Items	-	-	-	-
Tax Adjustment	(6.3)	-	-	(6.3)
Adjusted Net Income	**$150.0**	**$98.4**	**$110.8**	**$162.4**
% margin	*6.7%*	*5.8%*	*6.1%*	*6.8%*
Adjusted Diluted EPS	$1.20	$0.79	$0.89	$1.30

= Negative Adjustment for Pre-tax Gain on Litigation Settlement
x Marginal Tax Rate
= - ($25 million x 25.0%)

Net Income$_{2018}$ + Net Income$_{9/30/2019\ Current\ Stub}$ - Net Income$_{9/30/2018\ Prior\ Stub}$
= $150.0 million + $98.4 million - $110.8 million

Adjusted LTM EBIT + LTM Depreciation & Amortization
= $316.5 million + $107.0 million

a. $768.5 million. LTM gross profit is calculated by taking the full prior fiscal year's gross profit, adding the YTD gross profit for the current year period ("current

stub"), and then subtracting the YTD gross profit from the prior year ("prior stub"). ($725.0 million + $543.8 million – $587.3 million)

b. $316.5 million. To calculate adjusted LTM EBIT, first add back the $25.0 million litigation settlement for the fiscal year 2018 period. Next, the LTM statistic is calculated in the same manner as shown in 3(a). ($300.0 million + $206.3 million – $222.8 million)

c. $423.5 million. To calculate adjusted LTM EBITDA add LTM deprecation and amortization to LTM EBIT. ($316.5 million + $107.0 million)

d. $162.4 million. To calculate adjusted LTM net income, first add back the full litigation settlement charge to net income. Then, to make the tax adjustment, multiply the full add back amount by Rosenbaum's marginal tax rate. Next, the LTM statistic is calculated in the same manner as shown in 3(a). ($150.0 million + $98.4 million – $110.8 million)

4) Transaction multiples

($ in millions, except per share data)

LTM Transaction Multiples	
EV/Sales	1.6x
Metric	$2,385.0
EV/EBITDA	9.0x
Metric	$423.5
EV/EBIT	12.1x
Metric	$316.5
P/E	15.4x
Metric	$1.30

= Offer Price Per Share / LTM EPS
= $20.00 / $1.30

= Enterprise Value / LTM EBIT
= $3,825.0 million / $316.5 million

= Enterprise Value / LTM EBITDA
= $3,825.0 million / $423.5 million

= Enterprise Value / LTM Sales
= $3,825.0 million / $2,385.0 million

a. 1.6x. Enterprise value-to-sales is calculated as enterprise value divided by LTM sales. ($3,825.0 million / $2,385.0 million)

b. 9.0x. Enterprise value-to-EBITDA is calculated as enterprise value divided by LTM EBITDA. ($3,825.0 million / $423.5 million)

c. 12.1x. Enterprise value-to-EBIT is calculated as enterprise value divided by LTM EBIT. ($3,825.0 million / $316.5 million)

d. 15.4x. Price-to-EPS is calculated as the offer price per share divided by LTM EPS. ($20.00 / $1.30)

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5) Premiums paid

Premiums Paid		
Transaction Announcement		**Premium**
1 Day Prior	$17.39	15.0%
Unaffected Share Price		
1 Day Prior	$14.81	35.0%
7 Days Prior	15.04	33.0%
30 Days Prior	14.60	37.0%

= Offer Price per Price / Share Price One Day Prior to Announcement - 1
= $20.00 / $14.60 - 1

= Offer Price per Price / Share Price One Day Prior to Announcement - 1
= $20.00 / $15.04 - 1

= Offer Price per Price / Share Price One Day Prior to Announcement - 1
= $20.00 / $14.81 - 1

= Offer Price per Price / Share Price One Day Prior to Announcement - 1
= $20.00 / $17.39 - 1

a. 15.0%. Premium paid one day prior to the transaction announcement is calculated as the offer price per share divided by the share price one day prior to announcement of the deal. ($20.00 / $17.39 – 1)

b. 35.0%. ($20.00 / $14.81 – 1)

c. 33.0%. ($20.00 / $15.04 – 1)

d. 37.0%. ($20.00 / $14.60 – 1)

6) Precedent transactions equity value and enterprise value calculations

($ in millions)

Equity Value and Enterprise Value			
Acquirer	**Target**	**Equity Value**	**Enterprise Value**
Pearl Corp.	Rosenbaum Industries	$2,500.0	$3,825.0
Goodson Corp.	Schneider & Co.	5,048.8	6,173.8
Domanski Capital	Ackerman Industries	8,845.0	9,995.0

= Offer Price per Share x Fully Diluted Shares
= $37.25 x 135.5 million

= Equity Value + Total Debt - Total Cash
= $8,845.0 million + $1,250.0 million - $100.0 million

a. $5,048.8 million. Equity value is calculated as the offer price per share multiplied by fully diluted shares outstanding. ($37.25 x 135.5 million shares)

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b. $9,995.0 million. Enterprise value is calculated as equity value plus total debt less total cash. ($8,845.0 million + $1,250.0 million – $100.0 million)

7) Precedent transaction multiples

= Enterprise Value / EBITDA
= $1,350.0 million / $110.0 million

= Enterprise Value / EBITDA
= $9,995.0 million / $1,181.3 million

= Enterprise Value / Sales
= $6,174.0 million / $4,359.0 million

		Enterprise Value /		
Acquirer	**Target**	**LTM Sales**	**LTM EBITDA**	**LTM EBIT**
Pearl Corp.	Rosenbaum Industries	1.6x	9.0x	12.1x
Goodson Corp.	Schneider & Co.	1.4x	8.6x	11.3x
Domanski Capital	Ackerman Industries	1.7x	8.5x	10.9x
The Hochberg Group	Whalen Inc.	1.9x	9.0x	12.3x
Mean		**1.7x**	**8.8x**	**11.6x**
Median		**1.6x**	**8.8x**	**11.7x**
High		**1.9x**	**9.0x**	**12.3x**
Low		**1.4x**	**8.5x**	**10.9x**

= Max (Rosenbaum Industries Enterprise Value / EBITDA
: Whalen Inc. Enterprise Value / EBITDA)
= Max (9.0x : 9.0x)

= Average (Rosenbaum Industries Enterprise Value / EBITDA
: Whalen Inc. Enterprise Value / EBITDA)
= Average (9.0x : 9.0x)

= Min (Rosenbaum Industries Enterprise Value / EBIT
: Whalen Inc. Enterprise Value / EBIT)
= Min (12.1x : 12.3x)

= Median (Rosenbaum Industries Enterprise Value / EBIT
: Whalen Inc. Enterprise Value / EBIT)
= Median (12.1x : 12.3x)

a. 1.4x. Enterprise value-to-sales is calculated as enterprise value divided by sales. ($6,174.0 million / $4,359.0 million)

b. 8.5x. ($9,995.0 million / $1,181.3 million)

c. 12.3x. ($1,350.0 million / $110.0 million)

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d. 8.8x. The mean enterprise value-to-EBITDA multiple for the precedent transactions is calculated by taking the average of the enterprise value/EBITDA multiples for the precedent transactions

e. 11.7x. The median enterprise value-to-EBIT multiple for the precedent transactions is calculated by taking the average of the two middle numbers of the group as there are four transactions

f. 9.0x. The highest enterprise value-to-EBITDA multiple for the precedent transactions is the maximum enterprise value/EBITDA multiple for the precedent transactions

g. 10.9x. The lowest enterprise value-to-EBIT multiple for the precedent transactions is the minimum enterprise value/EBIT multiple for the precedent transactions

8) C. With the exception of credit reports, all of the other choices are common sources for creating an initial list of comparable acquisitions. Other resources include equity & fixed income research reports and merger proxies.

9) D. All of the questions are relevant to gain a better understanding of an M&A transaction.

10) D. All of the choices are reasons strategic buyers can often pay more for a target than financial sponsors under normal market conditions.

11) A. Enterprise value-to-LTM EBITDA and offer price-to-LTM diluted EPS are the most generic and widely-used multiples in precedent transactions analysis.

12) D. Speed of execution, certainty of completion, regulatory approvals, and other structural considerations are sometimes equally as important to a seller as the purchase price.

13) D. The proxy statement contains a summary of the background and terms of the transaction, a description of the financial analysis underlying the fairness opinion(s) of the financial advisor(s), a copy of the definitive purchase/sale agreement ("definitive agreement"), and summary and pro forma financial data (if applicable, depending on the form of consideration). The target's customer list is not contained in a proxy statement.

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14) C. DEFM14A is a definitive proxy statement relating to an M&A transaction. The proxy statement contains the target's most recent basic share count, a detailed background of the merger, discussion of the premium paid, and an excerpt from the fairness opinion, among other items.

15) D. In an LBO of a public company where an "affiliate" (such as a senior company executive or significant shareholder) is part of the buyout group, the SEC requires broader disclosure of information used in the decision-making process on a Schedule 13E-3.

16) B. In a tender offer, an acquirer mails an Offer to Purchase to the target's shareholders and files a Schedule TO. The target must then file a Schedule 14D-9 within ten business days of the announcement of the tender. The Schedule 14D-9 contains a recommendation from the target's board of directors to the target's shareholders on how to respond to the tender offer.

17) D. A private acquirer does not need to file an 8-K as it is not subject to SEC disclosure requirements. For a public acquirer, an acquisition is required to be reported in an 8-K if the assets, income, or value of the target comprise 10% or greater of the acquirer's.

18) B. Purchase consideration refers to the mix of cash, stock, and/or other securities that the acquirer offers to the target's shareholders. In some cases, the form of consideration can affect the target shareholders' perception of the value embedded in the offer. For example, some shareholders may prefer cash over stock as payment due to its guaranteed value.

19) A. Scarcity value refers to a rare or highly desired asset that may be critical to an acquirer's strategic plan.

20) C. A fixed exchange ratio is most common. A fixed exchange ratio defines the number of shares of the acquirer's stock to be exchanged for each share of the target's stock. In a floating exchange ratio, the number of acquirer shares exchanged for target shares fluctuates so as to ensure a fixed value for the target's shareholders.

21) A. Synergies refer to the expected cost savings, growth opportunities, and other financial benefits that occur as a result of the combination of two businesses. On the cost side, traditional synergies include headcount reduction, consolidation of

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