

## Vol. 2, Chapter 15 – Ratio Analysis

### Problem 1: Solution

Transaction No.	Total Current Assets	Working Capital	Current Ratio
1	0	0	0
2	+	+	+
3	0	0	0
4	0	-	-
5	-	0	+
6	-	-	-
7	0	0	0
8	0	0	0
9	-	-	-
10	-	0	+

### Problem 2: Solution

Replacement reserve requirement = 6% of total revenue  
 Debt service payment = \$10,000 per month  
 Number of guest rooms = 200  
 Average Daily Rate (ADR) = \$100  
 Occupancy rate = 70%  
 Room revenue = 70% of total revenue  
 Net operating income = 15% of total revenue  
 Days in a year = 365

1. Determine the Inn's annual total revenue:

$$\text{Rooms revenue} = \text{ADR} \times \text{Occupancy} \times \text{\#of guestrooms} \times 365 = \$5,110,000$$

$$\text{Total revenue} = 5,110,000 / .7 = \underline{\underline{\$7,300,000}}$$

2. Determine the Inn's annual net operating income:

$$\text{Net operating income} = \text{total revenue} \times 15\% = \underline{\underline{\$1,095,000}}$$

3. Determine the Inn's debt service ratio for the year:

$$\frac{(\text{Net operating income} - \text{Cash for replacement reserve})}{\text{Debt service}} = \underline{\underline{5.475}}$$

### Problem 3: Solution

Revenue = \$8,000,000  
A/R = \$8,000,000  
ACP = 40 days

1.) Determine the maximum receivables balance the club can tolerate and still receive a good rating for credit and collections.

Good ACP = 40 days  
ACP = 365 / Accounts Receivable t/o  
A/R t/o = 9.125  
Avg. A/R = \$8,000,000 / 9.125  
Avg. A/R = \$876,712.33

Alternatively:

Avg. A/R = (Accounts Receivable / 365) × 40 = \$876,712.33

2.) If the Brooklyn Club is currently collecting receivables in 45 days, by how much must the receivables balance be reduced to achieve an ACP of 40 days?

ACP = 45 days  
ACP = 365 / Accounts Receivable t/o  
A/R t/o = 8.111111111  
A/R t/o = \$8,000,000 / Avg. A/R  
Avg. A/R at 45 days = \$986,301.37  
Avg. A/R at 40 days = \$876,712.33  
Amount of reduction for ACP to be 40 days = \$109,589.04

### Problem 4: Solution

ROE = 10% = Net income / equity  
Total asset t/o = 1.5 times = Total revenues / total assets  
ROS = 5% = Net income / sales  
Total assets = \$5,000,000

1. Determine total annual sales:

Total sales = Total assets × total asset t/o  
\$7,500,000

2. Determine the firm's net income:

Net income = Sales × ROS  
\$375,000

3. Determine the amount of the firm's total debt:

Total equity = Net income/ROE = \$3,750,000  
Total debt = Total assets - total equity = \$1,250,000

**Problem 5: Solution**

		<u>Solution</u>
A.		
1. Paid Occ. %		
Paid Rooms / Available Rooms	2,600 / (100×31)	<u>83.87%</u>
2. ADR		
Room Revenue / # Rooms Sold	222,720 / 2,560	<u>\$ 87.00</u>
3. RevPAR		
Paid Occ. % * ADR	83.87% × \$85	<u>\$ 71.29</u>
4. Ave. # of guests per double room sold		
Number of paid guests	4,653	
Number of guests in singles	<u>-950</u>	
Number of guests in doubles	3,703	
Number of doubles sold	<u>/ 1,610</u>	
Ave. # of guests per double	2.30	<u>2.3</u>

B.		
1. Food cost %		
COGS/Sales		
Beginning Inventory	12,000	
Purchases	160,000	
Employee Meals and Comps	-5,000	
Ending Inventory	<u>-14,000</u>	
COGS	153,000	
COGS/Sales	153,000/480,000	<u>31.87%</u>
2. Food Inventory Turnover		
COGS/ Ave. Inventory	153,000 / 13,000	<u>11.77</u> <u>times</u>

- C.
1. The change in the current ratio from 1.1 to 1.3 indicates an increase in liquidity.
  2. The change in A/R turnover from 24 to 20 reflects a decrease in liquidity because Dodgers Club is being less efficient in its collection methods.
  3. The profit margin is not a measure of liquidity.
  4. The increase in inventory turnover indicates an increase in liquidity. This is because the higher the turnover the better because it indicates that inventory is being used more quickly.

**Problem 6: Solution**

Food sales = \$4,000,000  
Food cost % = 40%  
Current ratio = 2  
Food inventory t/o = 16  
ACP = 45 days  
Year = 360 days

Complete CC's current section of its balance sheet:

Cash	\$150,000
Accounts Receivable	\$500,000 (1)
Food Inventory	<u>\$100,000</u> (2)
Total Current Assets	<u>\$750,000</u>
Accounts Payable	\$275,000
Accrued Expenses	<u>\$100,000</u>
Total Current Liabilities	<u>\$375,000</u> (3)

- (1)  $A/R\ t/o = 360 / ACP = 8$   
 $A/R\ t/o = \text{Total revenue} / \text{Avg. A/R}$   
(2)  $\text{Food inventory} = \text{Cost of food sold} / \text{Food inventory t/o}$   
(3)  $\text{Current ratio} = \text{Current assets} / \text{Current liabilities}$

**Problem 7: Solution**

<u>Balance Sheet</u>		<u>Income Statement</u>	
Cash	\$ 100,000	Room sales	\$1,500,000
Prop. & equip.	2,000,000	Food sales	500,000
		Cost of food sold	150,000
		Net income	200,000

Ratios  
Current ratio 1.4  
Food inventory turnover 12 times  
Average collection period 20 days  
Solvency ratio 2.5

Year = 365 days  
Current assets = Cash, food inventory, and A/R  
Cash = \$100,000  
Total assets = CA and P&E

1. Calculate the amount of accounts receivable:  
 $A/R\ t/o = 18.25$   
 $A/R = \$109,589.04$

**Problem 7: Solution** (continued)

2. Calculate the amount of food inventory:  
Food inventory = Cost of food used / food inventory t/o =  
 $\$12,500.00$
3. Calculate the amount of current liabilities:  
Current ratio = Current assets / current liabilities  
Current assets = \$222,089.04  
Current liabilities = Current assets/current ratio =  
 $\$158,635.03$
4. The total amount of debt:  
Total assets = \$2,222,089.04  
Total liabilities = Total assets / solvency ratio =  
 $\$888,835.62$
5. The total amount of owners' equity  
Owners' equity = Total assets - total liabilities  
 $\$1,333,253.42$

**Problem 8: Solution**

1. Total cost of food sold. First determine cost of food used by multiplying the inventory turnover ratio by the average food inventory. Then subtract employee food expense to determine the total cost of food sold. Let x = cost of food used  
 $x = 24 \times \$9,000 = \$216,000$   
 $\$216,000 - \$3,000 = \underline{\$213,000}$
2. Average lunch food service check. Determine the food service sales during lunch and divide by the number of meals served.  
 $\$60,000 \times .4 = \$24,000$   
 $\$24,000 / (100 \times 26 \times 1.5) = \underline{\$6.15}$
3. Cost of food used. Determine the cost of food used by adding the cost of employee meals to the cost of food sold.  
 $\$200 + (\$80,000 \times .34) = \underline{\$27,400}$
4. Ending food inventory. Determine the ending food inventory by using the food inventory turnover ratio.  
Cost of food used = \$30,000 + \$300 = \$30,300  
Let x = ending food inventory  
 $\$30,300 / [(\$9,000 + x) / 2] = 3.1$   
 $x = \underline{\$10,548.39}$

**Problem 9: Solution**

1. Quick Assets \$ 80,000

2. Total Sales \$1,200,000

A/R × A/R turnover = Total credit sales

Total credit sales = 50% total sales

3. Total Income after UOE

X = total income after UOE

X ÷ 1,200,000 = 30% \$ 360,000

4. Labor cost % \$400,000/\$1,200,000 = 33.33%

5. Paid Occ. % \$4,500/\$5,840 = 77.05%

2 × 30 = 60

(# rooms not available during June)

(200 × 30) - 60 = 5,940

(# rooms available for June)

6. Total asset turnover 1,200,000/1,000,000 = 1.2 times

### Problem 10: Solution

Incremental earnings:	Financing Alternatives		
	All <u>Equity</u>	All <u>Debt</u>	50% Equity 50% Debt
Earnings before interest & taxes	\$2,000,000	\$2,000,000	\$2,000,000
Less: interest expense @ 8%	0	1,600,000	800,000
Pre-tax income	2,000,000	400,000	1,200,000
Income taxes	600,000	120,000	360,000
Increase in net income	1,400,000	280,000	840,000
Prior net income	1,000,000	1,000,000	1,000,000
Total net income	2,400,000	1,280,000	1,840,000
Total shares outstanding	700,000	500,000	600,000
Earnings per share	\$3.43	\$2.56	\$3.07
EPS on base earnings	\$2.00	\$2.00	\$2.00
EPS on incremental earnings	\$1.43	\$0.56	\$1.07

### Problem 11: Solution

- Change in market price  
20X1 price ÷ \$2.40 = 11      20X1 price = \$26.40  
20X3 price ÷ \$2.60 = 13      20X3 price = \$33.80  
Net change in price: \$7.40
- Total assets  
Assume net income was declared as dividends (i.e., no retained earnings)  
  
EPS × number of shares outstanding = Net Income  
  
20X1: \$2,400,000/Total Average Assets = 12%  
Total Avg. Assets for 20X1 = \$20,000,000  
20X2: \$2,500,000/Total Average Assets = 12.5%  
Total Avg. Assets for 20X2 = \$20,000,000  
20X3: \$2,600,000/Total Average Assets = 13%  
Total Average Assets for 20X3 = \$ 20,000,000
- ROE 20X3:  
Assets = \$20,000,000  
Liabilities/Equity = 1.4  
\$20,000,000 = 1.4X + X  
\$20,000,000 = 2.4X  
X = \$8,333,333 = Equity  
ROE = Net income/Equity = \$2,600,000/\$8,333,333 = 31.2%

### Problem 12: Solution

1. Current Ratio

$$\frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{\$200,000}{\$210,000} = \underline{.95 \text{ to } 1}$$

2. Acid-Test Ratio

$$\frac{\text{Quick Assets}}{\text{Current Liabilities}} = \frac{\$195,000}{\$210,000} = \underline{.93 \text{ to } 1}$$

3. Debt-Equity Ratio

$$\frac{\text{Total Liabilities}}{\text{Total Owners' Equity}} = \frac{\$330,000}{\$310,000} = \underline{1.06 \text{ to } 1}$$

4. Number of Times Interest Earned Ratio

$$\frac{\text{EBIT}}{\text{Interest Expenses}} = \frac{\$213,000}{\$120,000} = \underline{1.78 \text{ times}}$$

5. Operating Efficiency Ratio

$$\frac{\text{Gross Operating Profit}}{\text{Total Sales}} = \frac{=\$ 375,000}{\$1,500,000} = \underline{25\%}$$

6. Profit Margin

$$\frac{\text{Net Income}}{\text{Total Revenue}} = \frac{\$ 65,100}{\$1,500,000} = \underline{4.34\%}$$

7. Return on Owners' Equity

$$\frac{\text{Net Income}}{\text{Average Owners' Equity}} = \frac{\$ 65,100}{\$277,450} = \underline{23.46\%}$$

8. Return on Total Assets

$$\frac{\text{Net Income}}{\text{Average Total Assets}} = \frac{\$ 65,100}{\$640,000} = \underline{10.17\%}$$



### Problem 13: Solution

1. Total Current Assets

$$\text{Accounts receivable turnover} = \frac{\text{Sales}}{\text{Average accounts receivable}}$$

$$20 = \frac{\$2,000,000}{\text{Average A/R}}$$

$$\text{A/R} = \$100,000$$

$$\begin{aligned}\text{Quick assets} &= \text{Cash, marketable securities, accts receivable} \\ &= \$10,000 + \$100,000 \\ &= \$110,000\end{aligned}$$

$$\begin{aligned}\text{Total current assets} &= \$110,000 + \text{nonquick assets} \\ &= \$110,000 + .25(\$110,000) \\ &= \underline{\underline{\$137,500}}\end{aligned}$$

2. Total Current Liabilities

$$\text{Current ratio} = \frac{\text{CA}}{\text{CL}}$$

$$1.5 = \frac{\$137,500}{\text{CL}}$$

$$\text{CL} = \underline{\underline{\$91,667}}$$

3. Net Income

$$\begin{aligned}\text{Net income} &= \text{sales} \times \text{profit margin} \\ &= \$2,000,000 \times .05 \\ &= \underline{\underline{\$100,000}}\end{aligned}$$

4. Asset Turnover

$$\text{Asset turnover} = \frac{\text{Sales}}{\text{Average total assets}}$$

$$\begin{aligned}\text{Total assets} &= \text{Current assets} + \text{property and equipment} \\ &= \$137,500 + \$1,500,000 \\ &= \$1,637,500\end{aligned}$$

$$\begin{aligned}\text{Asset turnover} &= \frac{\$2,000,000}{\$1,637,500} \\ &= \underline{\underline{1.22}} \text{ times}\end{aligned}$$

**Problem 13: Solution** (continued)

5. Total Owners' Equity

$$\text{ROE} = \frac{\text{Net income}}{\text{Average total owners' equity}}$$

$$.10 = \frac{\$100,000}{\text{Average total owners' equity}}$$

$$\text{Total owners' equity} = \underline{\underline{\$1,000,000}}$$

6. Long-Term Debt

$$\begin{aligned} \text{LTD} &= \text{total liability and owners' equity} - \text{owners' equity} - \\ &\quad \text{current liabilities} \\ &= \$1,637,500 - \$1,000,000 - \$91,667 \\ &= \underline{\underline{\$545,833}} \end{aligned}$$

7. Return on Assets (ROA)

$$\text{ROA} = \frac{\text{Net income}}{\text{Average total assets}}$$

$$= \frac{\$100,000}{\$1,637,500}$$

$$= \underline{\underline{6.11\%}}$$

8. Debt-Equity Ratio

$$\text{Debt-equity ratio} = \frac{\text{Debt}}{\text{Owners' equity}}$$

$$= \frac{\$637,500}{\$1,000,000}$$

$$= \underline{\underline{63.75\%}}$$

**Problem 14: Solution**

Part 1

	<u>June</u>	<u>July</u>
a. Paid occupancy percentage		
Paid = $\frac{\text{Paid Rooms Occupied}}{\text{Available Rooms}}$	$\frac{6,600}{300 \times 30}$	$\frac{6,696}{300 \times 31}$
Paid occupancy percentage =	<u>73.33%</u>	<u>72.00%</u>
b. Multiple occupancy percentage		
Multiple Occ. = $\frac{\text{Rooms Occupied by Two or More People}}{\text{Rooms Occupied by Guests}}$	$\frac{4,200}{6,600}$	$\frac{4,278}{6,696}$
Multiple occupancy percentage =	<u>63.64%</u>	<u>63.89%</u>
c. Average number of guests per double room sold		
Number of paid guests	9,900	9,910
- <u>Number guests in singles</u>	- 2,400	- 2,418
= <u>Number of guests in doubles</u>	7,500	7,492
÷ <u>Number of doubles sold</u>	÷ 4,200	÷ 4,278
= Average number of guests per double	<u>1.79</u>	<u>1.75</u>
d. Monthly ADR		
ADR = $\frac{\text{Room Revenue}}{\text{Number of Rooms Sold}}$		
=	$\frac{\$396,000}{6,600}$	$\frac{\$399,000}{6,696}$
=	<u>\$60.00</u>	<u>\$59.59</u>
e. Monthly RevPAR		
RevPAR = Paid occupancy percentage × ADR		
=	.7333 (60)	.72 (59.59)
=	<u>\$44</u>	<u>\$42.90</u>

Part 2

The discussion should focus primarily on RevPAR. Remember to consider that June has 30 days and July has 31 days.

**Problem 15: Solution**

1. Paid occupancy rate for 20X1

$$\frac{\text{Rooms Sold}}{\text{Rooms Available for Sale}} = \frac{77,800}{89,425^*} = \underline{87\%}$$

$$*250(365)(.98) = 89,425$$

2. Number of paid guests

$$\text{Rooms Sold (Average Occ. Per Room)} = 77,800 \times 1.32 = \underline{102,696}$$

3. Beginning inventory of food

$$\text{Food Inventory Turnover} = \frac{\text{Cost of Food Used}}{\text{Average Food Inventory}}$$

$$10 = \frac{\$317,000^*}{\frac{\text{Beginning Inventory} + \$35,000}{2}}$$

$$\text{Beginning Inventory} = \underline{\$28,400}$$

$$*\text{Cost of sales} + \text{consumption by employees} = \text{cost of food used}$$
$$\$312,000 + \$5,000 = \underline{\$317,000}$$

4. Food sales

$$\text{Food Sales (Food Cost \%)} = \text{Cost of Sales}$$

$$\text{Food Sales (.4)} = \$312,000$$

$$\text{Food Sales} = \underline{\$312,000}$$

$$\text{Food Sales} = \frac{\$312,000}{.4} = \underline{\$780,000}$$

5. Multiple occupancy percentage

$$\frac{\text{Rooms Occupied by Two or More People}}{\text{Total Rooms Sold}} = \frac{24,896^*}{77,800} = \underline{32\%}$$

$$*\text{number of paid guests} - \text{rooms sold} = \text{doubles sold}$$
$$102,696 - 77,800 = \underline{24,896}$$

## Problem 16: Solution

### Part 1

		<u>20X3</u>	<u>20X4</u>
a.	Average Food Service Check		
	$\frac{\text{Food sales}}{\text{Food customers served}} =$	$\frac{\$800,000}{66,667}$	$\frac{\$850,000}{65,385}$
		$= \underline{\$12.00}$	$= \underline{\$13.00}$
b.	Food Cost Percentage		
	$\frac{\text{Cost of food sold}}{\text{Food sales}} =$	$\frac{\$160,000}{\$800,000}$	$\frac{\$170,000}{\$850,000}$
		$= \underline{20\%}$	$= \underline{20\%}$
c.	Labor Cost Percentage		
	$\frac{\text{Labor costs}}{\text{Total sales}} =$	$\frac{\$210,000}{\$850,000}$	$\frac{\$225,000}{\$910,000}$
		$= \underline{24.71\%}$	$= \underline{24.73\%}$
d.	Labor Cost per Customer Served		
	$= \frac{\$210,000}{66,667}$	$= \frac{\$225,000}{65,385}$	
		$= \underline{\$3.15}$	$= \underline{\$3.44}$
e.	Number of Times Interest Earned		
	$\frac{\text{EBIT}}{\text{Interest expense}} =$	$\frac{\$190,000}{\$80,000}$	$\frac{\$196,000}{\$75,000}$
		$= \underline{2.38 \text{ times}}$	$= \underline{2.61 \text{ times}}$
f.	Operating Efficiency Ratio		
	$\frac{\text{Income before occ. costs, depreciation and interest}}{\text{Total sales}} =$	$\frac{\$310,000}{\$850,000}$	$\frac{\$321,000}{\$910,000}$
		$= \underline{36.47\%}$	$= \underline{35.27\%}$

**Problem 16: Solution** (continued)

g. Fixed Charge Coverage Ratio =

<u>EBIT + rent exp.</u>	=	<u>\$200,000</u>	<u>\$207,000</u>
Interest + rent exp.	=	\$90,000	\$86,000
	=	<u>2.22</u> times	<u>2.41</u> times

h. Profit Margin =

<u>Net income</u>	=	<u>\$80,000</u>	<u>\$86,000</u>
Total sales	=	\$850,000	\$910,000
	=	<u>9.41%</u>	<u>9.45%</u>

**Part 2**

Efficiency normally relates to the use of an organization's resources. In particular, labor is the major variable since the food cost percentage was 20% for each year. The labor cost as a percentage of total sales was .02% less during 20X3 than in 20X4. On a per-customer basis, labor cost for 20X3 was \$.29 lower than for 20X4. In spite of the greater efficiency of labor usage in 20X3 compared to 20X4, Drysdale Pizza was more profitable by \$6,000 in 20X4 than in 20X3, and the profit margin was .04% higher in 20X4 than in 20X3.

**Problem 17: Solution**

1. 20X6:  $(\$160,000 / \$110,000) = 1.45$   
20X7:  $(\$225,000 / \$115,000) = 1.96$
2. 20X6:  $(\$20,000 + \$20,000 + \$90,000) / \$110,000 = 1.18$   
20X7:  $(\$60,000 + \$25,000 + \$115,000) / \$115,000 = 1.74$
3.  $\$2,700,000 / [(\$90,000 + \$115,000) / 2] = 26.34$  times
4.  $\$330,000 / [(\$2,360,000 + \$2,525,000) / 2] = 13.51\%$
5.  $\$330,000 / [(\$1,250,000 + \$1,360,000) / 2] = 25.29\%$
6.  $\$750,000 / \$2,780,000 = 26.98\%$
7.  $\$80,000 / \$410,000 = 19.51\%$
8. 20X6:  $\$2,360,000 / \$1,110,000 = 2.13$   
20X7:  $\$2,525,000 / \$1,165,000 = 2.17$
9.  $\$700,000 / [(\$1,110,000 + \$1,165,000) / 2] = 61.54\%$
10.  $\$700,000 / [(\$115,000 + \$110,000) / 2] = 6.22$
11.  $\$330,000 / \$2,780,000 = 11.87\%$

**Problem 18: Solution**

	<u>20X1</u>	<u>20X2</u>
1. a. Current Ratio		
$\frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{\$75,000}{\$55,000} = \underline{1.36 \text{ to } 1}$		$\frac{\$137,000}{\$60,000} = \underline{2.28 \text{ to } 1}$
b. Solvency Ratio		
$\frac{\text{Total Assets}}{\text{Total Liabilities}} = \frac{\$2,365,000}{\$1,355,000} = \underline{1.75 \text{ to } 1}$		$\frac{\$2,337,000}{\$1,310,000} = \underline{1.78 \text{ to } 1}$
c. Profit Margin		
$\frac{\text{Net Income}}{\text{Total Sales}} = \frac{\$10,000}{\$1,200,000} = \underline{.83\%}$		$\frac{\$55,000}{\$1,400,000} = \underline{3.93\%}$
d. Operating Efficiency Ratio		
$\frac{\text{Gross Operating Profit}}{\text{Total Sales}} = \frac{\$200,000}{\$1,200,000} = \underline{16.67\%}$		$\frac{\$300,000}{\$1,400,000} = \underline{21.43\%}$
2. a. Fixed Assets Turnover Ratio		
$\frac{\text{Sales}}{\text{Average Fixed Assets}} = \frac{\$1,400,000}{\frac{(\$2,290,000 + \$2,200,000)}{2}} = \underline{.62 \text{ times}}$		
b. Total Assets Turnover Ratio		
$\frac{\text{Sales}}{\text{Average Total Assets}} = \frac{\$1,400,000}{\frac{(\$2,365,000 + \$2,337,000)}{2}} = \underline{.60 \text{ times}}$		
c. Accounts Receivable Turnover Ratio		
$\frac{\text{Sales}}{\text{Average Accounts Receivable}} = \frac{\$1,400,000}{\frac{(\$55,000 + \$60,000)}{2}} = \underline{24.35 \text{ times}}$		
d. Number of Days Accounts Receivable Outstanding		
$\frac{\text{Days in Year}}{\text{Accounts Receivable Turnover}} = \frac{365}{24.35} = \underline{14.99 \text{ days}}$		
e. Return on Total Assets		
$\frac{\text{Net Income}}{\text{Average Total Assets}} = \frac{\$55,000}{\$2,351,000} = \underline{2.34\%}$		
f. Return on Owners' Equity		
$\frac{\text{Net Income}}{\text{Average Owners' Equity}} = \frac{\$55,000}{\frac{(\$1,010,000 + \$1,027,000)}{2}} = \underline{5.40\%}$		

**Problem 19: Solution**

1. ROA = net income/average total assets

ROA for:

Gibson Hotel:	\$2,700,000/\$20,000,000 = 13.5%
Brock Hotel:	\$4,500,000/\$15,000,000 = 30.0%
Smith Hotel:	\$3,000,000/\$25,000,000 = 12.0%
Carey Hotel:	\$3,000,000/\$18,000,000 = 16.67%

2. ROA of proposed expansion

$$\text{ROA} = \frac{650,000}{5,000,000} = \underline{13.0\%}$$

Only the Smith Hotel with a ROA (Part 1) of 12% would be expanded when the basis for expansion is maintaining or improving a hotel's ROA, since the ROA on the expansion is only 13.0%. If the other hotels expanded, their overall ROAs would decline while the Smith Hotel's overall ROA would increase from 12% to 12.17%.

3. Residual income

	<u>Current</u>	<u>Proposed</u>	<u>Total</u>
<u>Gibson Hotel</u>			
Average total assets	\$20,000,000	\$5,000,000	\$25,000,000
Net income	\$ 2,700,000	\$ 650,000	\$ 3,350,000
Minimum required return (12%)	<u>2,400,000</u>	<u>600,000</u>	<u>3,000,000</u>
Residual income	<u>\$ 300,000</u>	<u>\$ 50,000</u>	<u>\$ 350,000</u>
<u>Brock Hotel</u>			
Average total assets	\$15,000,000	\$5,000,000	\$20,000,000
Net income	\$ 4,500,000	\$ 650,000	\$ 5,150,000
Minimum required return (12%)	<u>1,800,000</u>	<u>600,000</u>	<u>2,400,000</u>
Residual income	<u>\$ 2,700,000</u>	<u>\$ 50,000</u>	<u>\$ 2,750,000</u>
<u>Smith Hotel</u>			
Average total assets	\$25,000,000	\$5,000,000	\$30,000,000
Net income	\$ 3,000,000	\$ 650,000	\$ 3,650,000
Minimum required return (12%)	<u>3,000,000</u>	<u>600,000</u>	<u>3,600,000</u>
Residual income	<u>\$ -0-</u>	<u>\$ 50,000</u>	<u>\$ 50,000</u>
<u>Carey Hotel</u>			
Average total assets	\$18,000,000	\$5,000,000	\$23,000,000
Net income	\$ 3,000,000	\$ 650,000	\$ 3,650,000
Minimum required return (12%)	<u>2,160,000</u>	<u>600,000</u>	<u>2,760,000</u>
Residual income	<u>\$ 840,000</u>	<u>\$ 50,000</u>	<u>\$ 890,000</u>



## Problem 20: Solution

### Billy Martin Motel and Restaurant Balance Sheet

#### Assets

Current Assets	
Cash	\$ 2,000
Accounts Receivable	10,000
Inventory	<u>6,000</u>
Total Current Assets	18,000
Fixed Assets	<u>282,000</u>
Total Assets	<u>\$300,000</u>

#### Liabilities and Owners' Equity

Accounts Payable	\$ 15,000
Long-Term Debt	<u>135,000</u>
Total Liabilities	150,000
Owners' Equity	<u>150,000</u>
Total Liabilities and Owners' Equity	<u>\$300,000</u>

### Billy Martin Motel and Restaurant Income Statement

<u>Total</u>	<u>Rooms</u>		<u>Food*</u>	<u>Beverages*</u>	
Sales	\$146,000		\$96,250	\$57,750	\$300,000
Cost of Sales	-0-		38,500	12,705	51,205
Labor and Other Expense	<u>58,400</u>		<u>28,875</u>	<u>17,325</u>	<u>104,600</u>
Department Income	<u>\$ 87,600</u>		<u>28,875</u>	<u>27,720</u>	144,195
Deductions from Income					<u>100,000</u>
Gross Operating Profit			44,195		
Interest Expense					13,500
Depreciation Expense					<u>28,200</u>
Income Before Income Taxes					2,495
Taxes					<u>499</u>
Net Income					<u>\$ 1,996</u>

\*Shown separately for illustrative purposes.

**Problem 20: Solution** (continued)

Selected Calculations

Item #

5 Current Ratio (CR) = 1.2 to 1

If Current Liabilities (CL) = \$15,000  
then Current Assets (CA) = 1.2(\$15,000) = \$18,000

Cash + Accounts Receivable (AR) + Inventory = \$18,000

6 Acid-Test Ratio = .8 to 1

If CL = \$15,000  
Quick Assets (QA) = .8(\$15,000) = \$12,000

Cash + AR = \$12,000

QA - AR = Cash

\$12,000 - \$10,000 = \$2,000 Cash

If CA = \$18,000 and QA = \$12,000, then Inv. = \$6,000

7 AR Turnover = 30 times

Sales ÷ Average AR = AR Turnover

Sales ÷ \$10,000 = 30; Sales = \$300,000

15,17,  
18 Room Sales

25(.80)(365)(\$20) = \$146,000 room sales

16,19 Food and Beverage Sales

\$30,800 × 5 = \$154,000 food and beverage sales

24 Rooms--Labor and Other Expense

\$146,000(.4) = \$58,400

20 Deductions from Income

33 $\frac{1}{3}$ %(\$300,000) = \$100,000

11 Depreciation

10% (Fixed Assets Book Value) = Depreciation Expense

.1(\$282,000) = \$28,200

**Problem 20: Solution** (continued)

Item #

12 Long-Term Debt (LTD)

$$\begin{aligned} 9 \times \text{CL} &= \text{LTD} \\ 9 \times \$15,000 &= \underline{\$135,000} \end{aligned}$$

13 Interest Rate = 10%

$$\text{Interest Expense} = \$135,000(.10) = \underline{\$13,500}$$

14 Tax Rate = 10%

$$\begin{aligned} \text{Income before Income Tax (.2)} &= \text{Income Tax} \\ \$2,495(.2) &= \underline{\$499} \end{aligned}$$

26  $\frac{\text{Debt}}{\text{Equity}} = \underline{1 \text{ to } 1}$                        $\frac{\text{Debt}}{\text{Equity}} = \frac{\$150,000}{\text{Equity}} = 1$

$$\text{Equity} = \underline{\$150,000}$$

27 Return on Owners' Equity

$$\text{Net income} = .0133066 (\text{Equity})$$

$$\text{Net income} = .0133066 (150,000)$$

$$\text{Net income} = \underline{\$1,996}$$

25 Food and Beverage Sales

$$62.5\%(\$154,000) = \underline{\$96,250} \text{ food sales}$$

$$37.5\%(\$154,000) = \underline{\$57,750} \text{ beverage sales}$$

21 Cost of Food Sales

$$\$96,250(.4) = \underline{\$38,500}$$

22 Cost of Beverage Sales

$$57,750(.22) = \underline{\$12,705}$$

8 Food Inventory

$$\text{Food Inventory Turnover} = \frac{\text{Cost of Food Sales}}{\text{Average Inventory}}$$

$$9.625 = \frac{\$38,500}{\text{Aver. Inv.}}; \text{Aver. Inv.} = \underline{\$4,000}$$

**Problem 20: Solution** (continued)

Item #

9 Beverage Inventory

$$\text{Beverage Inventory Turnover} = \frac{\text{Cost of Beverage Sales}}{\text{Aver. Inv.}}$$

$$6.3525 = \frac{\$12,705}{\text{Aver. Inv.}}; \text{Aver. Inv.} = \underline{\$2,000}$$

$$10 \frac{\text{Fixed Assets (FA)}}{\text{Fixed Assets Turnover}} = \frac{\text{Total Sales}}{\text{Aver. FA}} = \frac{\$300,000}{\text{Aver. FA}} = 1 \frac{3}{47}$$

$$\text{FA} = \underline{\$282,000}$$

23 Food and Beverage Labor and Other

$$\$96,250 (.3) = \underline{\$28,875} \text{ food}$$

$$\$57,750 (.3) = \underline{\$17,325} \text{ beverage}$$