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SECTION A

FINANCIAL STATEMENT ANALYSIS

(20% of the CMA exam)

Basic Financial Statement Analysis

✓ Learning Objectives

The candidate should be able to:

- For the balance sheet and income statement prepare and analyze common-size financial statements; i.e., calculate percentage of assets and sales, respectively; also called vertical analysis.
- For the balance sheet and income statement prepare a comparative financial statement horizontal analysis; i.e., calculate trend year over year for every item on the financial statement compared to base year.
- Calculate the growth rate of individual line items on the balance sheet and income statement.

A.1.1. Basic Financial Statement Analysis

A.1.1.1. For the balance sheet and income statement prepare and analyze common-size financial statements; i.e., calculate percentage of assets and sales, respectively; also called vertical analysis

Vertical analysis presents financial statement line items as a percentage of a base. For the balance sheet, individual line items of assets, liabilities, and equity are represented as a percentage of total assets. For the income statement, individual line items of revenues, expenses and income items such as operating income, and net income are presented as a percentage of total sales.

The vertical analysis percentage of base formula:

$$\text{Percentage of base} = \frac{\text{Amount of Individual Line Item}}{\text{Base Amount}}$$

Vertical analysis, or common size financial statements, are used to compare different companies during the same period of time to assess the company's financial competitiveness. Vertical analysis can also be used to assess the company's performance against the industry or last year's common size statement. Examples of vertical analysis financial statements are presented below:

Adagio Corporation
Vertical Analysis – Income Statement

	Amount	Percentage
Sales	\$ 3,750,000	100.0%
Cost of Goods Sold	1,425,000	38.0%
Gross Profit	2,325,000	62.0%
Operating Expenses	650,000	17.3%
Income From Operations	1,675,000	44.7%
Interest Expense	50,000	1.3%
Net Income Before Income Tax	1,625,000	43.3%
Income Tax Expense	487,500	13.0%
Net Income	\$ 1,137,500	30.3%

Adagio Corporation
Vertical Analysis-Balance Sheet

	Amount	Percentage
Cash	\$ 1,628,500	27.4%
Accounts Receivable	1,125,000	18.9%
Merchandise Inventory	2,625,000	44.1%
Total Current Assets	5,378,500	90.3%
Land	200,000	3.4%
Building (net)	272,500	4.6%
Truck (net)	82,500	1.4%
Equipment (net)	20,000	0.3%
Total Noncurrent Assets	575,000	9.7%
Total Assets	\$ 5,953,500	100.0%
Accounts Payable	\$ 1,050,000	17.6%
Income Taxes Payable	487,500	8.2%
Bonds Payable	500,000	8.4%
Total Liabilities	2,037,500	34.2%
Common Stock	1,500,000	25.2%
Additional Paid-in-Capital	400,000	6.7%
Retained Earnings	2,016,000	33.9%
Total Shareholder's Equity	3,916,000	65.8%
Total Liabilities and Shareholder's Equity	\$ 5,953,500	100.0%

A.1.1.2. For the balance sheet and income statement prepare a comparative financial statement horizontal analysis; i.e., calculate trend year over year for every item on the financial statement compared to base year

Horizontal analysis presents the financial position (balance sheet) and financial performance (income statement) trend of a single company over time. Horizontal analysis allows financial statement users to assess the financial progress of a company over time. Generally, a base year is set as a reference point that will serve as the denominator for the change in amount between the comparison years.

The percentage change between periods is computed as the change in amount between two periods over the base year amount. Examples of horizontal analysis financial statements are presented below:

Adagio Corporation
Horizontal Analysis-Income Statement

	2016	2015	% Change
Sales	\$ 3,750,000	\$ 3,000,000	25.0%
Cost of Goods Sold	1,425,000	1,170,000	21.8%
Gross Profit	2,325,000	1,830,000	27.0%
Operating Expenses	650,000	525,000	23.8%
Income From Operations	1,675,000	1,305,000	28.4%
Interest Expense	50,000	50,000	0.0%
Net Income Before Income Tax	1,625,000	1,255,000	29.5%
Income Tax Expense	487,500	376,500	29.5%
Net Income	\$ 1,137,500	\$ 878,500	29.5%

In the example above, Adagio Corporation's base year is 2015 and the percentage changes for income statement line items were computed as follows:

Sales	=	$(\$3,750,000 - \$3,000,000) / \$3,000,000 = 25\%$
Cost of Goods Sold	=	$(\$1,425,000 - \$1,170,000) / \$1,170,000 = 21.8\%$
Gross Profit	=	$(\$2,325,000 - \$1,830,000) / \$1,830,000 = 27\%$
Operating Expenses	=	$(\$650,000 - \$525,000) / \$525,000 = 23.8\%$
Income from Operations	=	$(\$1,675,000 - \$1,305,000) / \$1,305,000 = 28.4\%$
Interest Expense	=	$(\$50,000 - \$50,000) / \$50,000 = 0\%$
Net Income before Income Tax	=	$(\$1,625,000 - \$1,255,000) / \$1,255,000 = 29.5\%$
Income Tax Expense	=	$(\$487,500 - \$376,500) / \$376,500 = 29.5\%$
Net Income	=	$(\$1,137,500 - \$878,500) / \$878,500 = 29.5\%$

The same computation used for the income statement will be applied for the balance sheet as represented below:

Adagio Corporation
Horizontal Analysis-Balance Sheet

	2016	2015	% Change
Cash	\$ 1,628,500	\$ 782,000	108.2%
Accounts Receivable	1,125,000	825,000	36.4%
Merchandise Inventory	2,625,000	2,040,000	28.7%
Total Current Assets	\$ 5,378,500	\$ 3,647,000	47.5%
Land	200,000	200,000	0.0%
Building (net)	272,500	300,000	-9.2%
Truck (net)	82,500	90,000	-8.3%
Equipment (net)	20,000	30,000	-33.3%
Total Noncurrent Assets	575,000	620,000	-7.3%
Total Assets	\$ 5,953,500	\$ 4,267,000	39.5%
Accounts Payable	\$1,050,000	\$ 612,000	71.6%
Income Taxes Payable	487,500	376,500	29.5%
Bonds Payable	500,000	500,000	0.0%
Total Liabilities	2,037,500	1,488,500	36.9%
Common Stock	1,500,000	1,500,000	0.0%
Additional Paid-in-Capital	400,000	400,000	0.0%
Retained Earnings	2,016,000	878,500	129.5%
Total Shareholder's Equity	3,916,000	2,778,500	40.9%
Total Liabilities and Shareholder's Equity	\$ 5,953,500	\$ 4,267,000	39.5%

A.1.1.3. Calculate the growth rate of individual line items on the balance sheet and income statement

The growth rate of individual line items on the balance sheet and income statement can be computed using the following formulas:

$$\text{Growth Rate of Sales} = \frac{\text{Change in Sales}}{\text{Base Year Sales}}$$

or

$$\text{Growth Rate of Total Assets} = \frac{\text{Ending Balance} - \text{Beginning Balance}}{\text{Beginning Balance}}$$

Comprehensive Illustration:

Plantix Corporation's sales for the current year amounted to \$5,000,000 while sales last year amounted to \$4,000,000. Total assets at the end of 2016 amounted to \$12,000,000 while the beginning balance amounted \$10,000,000.

Required:

Compute for the Plantix's (a) growth rate of sales and (b) growth rate of total assets.

Computation:

A. GROWTH RATE OF SALES

$$\begin{aligned}\text{Growth Rate of Sales} &= \frac{\text{Change in Sales}}{\text{Base Year Sales}} \\ \text{Growth Rate of Sales} &= \frac{\$5,000,000 - \$4,000,000}{\$4,000,000} \\ \text{Growth Rate of Sales} &= \frac{\$1,000,000}{\$4,000,000} \\ \text{Growth Rate of Sales} &= 25\%\end{aligned}$$

B. GROWTH RATE OF TOTAL ASSETS

$$\begin{aligned}\text{Growth Rate of Total Assets} &= \frac{\text{Ending Balance} - \text{Beginning Balance}}{\text{Beginning Balance}} \\ \text{Growth Rate of Total Assets} &= \frac{\$12,000,000 - \$10,000,000}{\$10,000,000} \\ \text{Growth Rate of Total Assets} &= \frac{\$2,000,000}{\$10,000,000} \\ \text{Growth Rate of Total Assets} &= 20\%\end{aligned}$$

A.2

Financial Ratios

Learning Objectives

The candidate should be able to:

Liquidity

- a. Calculate and interpret the current ratio, the quick (acid-test) ratio, the cash ratio, the cash flow ratio, and the net working capital ratio.
- b. Explain how changes in one or more of the elements of current assets, current liabilities, and/or unit sales can change the liquidity ratios and calculate that impact.
- c. Demonstrate an understanding of the liquidity of current liabilities.

Leverage

- d. Define Solvency.
- e. Define operating leverage and financial leverage.
- f. Calculate degree of operating leverage and degree of financial leverage.
- g. Demonstrate an understanding of the effect on the capital structure and solvency of a company with a change in the composition of debt vs. equity by calculating leverage ratios.
- h. Calculate and interpret the financial leverage ratio, and determine the effect of a given change in capital structure on this ratio.
 - (i) Calculate and interpret the following ratios: debt to equity, long-term debt to equity, and debt to total assets.
- i. Define, calculate and interpret the following ratios: fixed charge coverage (earnings to fixed charges), interest coverage (times interest earned), and cash flow to fixed charges.
- j. Discuss how capital structure decisions affect the risk profile of a firm.

Activity

- k. Calculate and interpret accounts receivable turnover, inventory turnover and accounts payable turnover.
- l. Calculate and interpret days sales outstanding in receivables, days sales in inventory, and days purchases in accounts payable.
- m. Define and calculate the operating cycle and cash cycle of a firm.
- n. Calculate and interpret total assets turnover and fixed asset turnover.

Profitability

- o. Calculate and interpret gross profit margin percentage, operating profit margin percentage, net profit margin percentage, and earnings before interest, taxes, depreciation, and amortization (EBITDA) margin percentage.
- p. Calculate and interpret return on assets (ROA) and return on equity (ROE).

Market

- q. Calculate and interpret the market/book ratio, the price/earnings ratio and price to EBITDA ratio.
- r. Calculate and interpret book value per share.
- s. Identify and explain the limitations of book value per share.
- t. Calculate and interpret basic and diluted earnings per share.
- u. Calculate and interpret earnings yield, dividend yield, dividend payout ratio and shareholder return.

General

- v. Identify the limitations of ratio analysis.
- w. Demonstrate a familiarity with the sources of financial information about public companies and industry ratio averages.
- x. Evaluate the financial strength and performance of an entity based on multiple ratios.

A.2.1. Financial Ratios

A.2.2. Liquidity Ratios

A.2.2.1. Calculate and interpret the current ratio, the quick (acid-test) ratio, the cash ratio, the cash flow ratio, and the net working capital ratio

Current Ratio

Current Ratio is the ratio of current assets over current liabilities. The current ratio is considered to be the most basic ratio of liquidity. It measures the proportion of current resources (assets) that are available to satisfy current obligations (liabilities).

Current assets are the assets of an entity that are expected to be converted into cash or consumed within one year or the operating cycle, whichever is longer. Current assets include cash, marketable securities, accounts receivable, inventory, and prepaid expenses.

Current liabilities are the liabilities of an entity that are expected to settle within one year or the operating cycle, whichever is longer. Current liabilities include accounts payable, short-term notes payable, accrued expenses, and the current portion of long-term debt.

The formula to compute the current ratio is:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Quick (Acid-Test) Ratio

Quick (Acid-Test) Ratio is the ratio of quick assets over current liabilities. The quick ratio is a more conservative liquidity ratio than the current ratio by including only liquid assets as its numerator. Inventory and prepaid expenses are not included in the computation.

The formula to compute the quick ratio is:

$$\text{Quick Ratio (Acid Test Ratio)} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

Based on IMA Ratio definitions, the quick assets consist of cash, marketable securities, and accounts receivable only. The expanded formula to compute for the quick ratio is:

$$\text{Quick Ratio (Acid Test Ratio)} = \frac{\text{Cash} + \text{Marketable Securities} + \text{Accounts Receivable}}{\text{Current Liabilities}}$$

Cash Ratio

Cash Ratio is the ratio of cash and marketable securities over current liabilities. The cash ratio is considered to be the most conservative liquidity ratio as it only considers cash and marketable securities in its numerator.

The formula to compute the cash ratio is:

$$\text{Cash Ratio} = \frac{\text{Cash} + \text{Marketable Securities}}{\text{Current Liabilities}}$$

Cash Flow Ratio

Cash Flow Ratio is the ratio of the company's net operating cash inflow over current liabilities. This ratio measures the availability of net cash provided by operating activities to settle current obligations.

The formula to compute the cash flow ratio is:

$$\text{Cash Flow Ratio} = \frac{\text{Operating Cash Flow}}{\text{Current Liabilities}}$$

Net Working Capital Ratio

Net Working Capital Ratio is the ratio of the company's working capital over total assets. It measures the level of net current resources (working capital) in relation to the level of total assets.

The formula to compute the net working capital ratio is:

$$\text{Net Working Capital Ratio} = \frac{\text{Current Assets} - \text{Current Liabilities}}{\text{Total Assets}}$$

Comprehensive Illustration:

Using the balance sheet and statement of cash flows of Solar Play Company below, compute the following liquidity ratios (rounded off to two decimal places):

- Current Ratio
- Quick Ratio (Acid-Test Ratio)
- Cash Ratio
- Cash Flow Ratio

e) Net Working Capital Ratio

Solar Play Company
Balance Sheet
As of December 31, 2016

Current Assets:		
Cash		3,887,000
Accounts Receivable		420,000
Merchandise Inventory		560,000
Prepaid Insurance		7,000
Supplies		8,000
Total Current Assets		4,882,000
Fixed Assets:		
Land		400,000
Building	600,000	
Less: Accumulated Depreciation-Building	55,000	545,000
Truck	200,000	
Less: Accumulated Depreciation-Truck	35,000	165,000
Equipment	50,000	
Less: Accumulated Depreciation-Equipment	10,000	40,000
Total Net Fixed Assets		1,150,000
Total Assets		6,032,000
Current Liabilities:		
Accounts Payable		575,000
Unearned Service Revenue		50,000
Interest Payable		75,000
Salaries Payable		20,000
Utilities Payable		2,000
Income Taxes Payable		17,100
Total Current Liabilities		739,100
Noncurrent Liabilities:		
Bonds Payable		1,000,000
Total Liabilities		1,739,100
Shareholder's Equity:		
Common Stock	3,000,000	
Additional Paid-in-Capital	800,000	
Retained Earnings	492,900	4,292,900
Total Liabilities and Shareholder's Equity		6,032,000

Solar Play Company
Statement of Cash Flows
For the Year Ended December 31, 2016

Operating Activities:		
Net Income		492,900
Add: Depreciation (noncash expenses)		100,000
Total		<u>592,900</u>
Change in Current Assets/Current Liabilities:		
Decrease(Increase) in Accounts Receivable	(420,000)	
Decrease(Increase) in Merchandise Inventory	(560,000)	
Decrease(Increase) in Prepaid Insurance	(7,000)	
Decrease(Increase) in Supplies	(8,000)	
Increase(Decrease) in Accounts Payable	575,000	
Increase(Decrease) in Unearned Service Revenue	50,000	
Increase(Decrease) in Interest Payable	75,000	
Increase(Decrease) in Salaries Payable	20,000	
Increase(Decrease) in Utilities Payable	2,000	
Increase(Decrease) in Income Taxes Payable	17,100	(255,900)
Net Cash Provided by Operating Activities		<u>337,000</u>
Investing Activities:		
Additions to Fixed Assets:		
Equipment		(50,000)
Net Cash Used in Investing Activities		<u>(50,000)</u>
Financing Activities:		
Increase(Decrease) in Bonds Payable		1,000,000
Increase(Decrease) in Common Stock		1,000,000
Increase(Decrease) in Additional Paid-in-Capital		200,000
Net Cash Provided by Financing Activities		<u>2,200,000</u>
Net Increase in Cash		2,487,000
Cash Balance, January 1, 2016		1,400,000
Cash Balance, December 31, 2016		<u><u>3,887,000</u></u>

Computations:

A. CURRENT RATIO

$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$ $\text{Current Ratio} = \frac{\$4,882,000}{\$739,100}$ $\text{Current Ratio} = 6.61$
--

This means that company is capable of paying its current liabilities 6.61 times using its current assets.

B. QUICK (OR ACID-TEST) RATIO

$$\begin{aligned} \text{Quick Ratio (Acid Test Ratio)} &= \frac{\text{Cash} + \text{Marketable Securities} + \text{Accounts Receivable}}{\text{Current Liabilities}} \\ \text{Quick Ratio (Acid Test Ratio)} &= \frac{\$3,887,000 + \$0 + \$420,000}{\$739,100} \\ \text{Quick Ratio (Acid Test Ratio)} &= 5.83 \end{aligned}$$

This denotes that the company can satisfy its short-term debt 5.83 times with its quick assets.

C. CASH RATIO

$$\begin{aligned} \text{Cash Ratio} &= \frac{\text{Cash} + \text{Marketable Securities}}{\text{Current Liabilities}} \\ \text{Cash Ratio} &= \frac{\$3,887,000 + \$0}{\$739,100} \\ \text{Cash Ratio} &= 5.26 \end{aligned}$$

This means that the company can settle its current obligations 5.26 times using its cash and cash equivalents.

D. CASH FLOW RATIO

$$\begin{aligned} \text{Cash Flow Ratio} &= \frac{\text{Operating Cash Flow}}{\text{Current Liabilities}} \\ \text{Cash Flow Ratio} &= \frac{\$337,000}{\$739,100} \\ \text{Cash Flow Ratio} &= 0.46 \end{aligned}$$

This indicates that the company's operating cash flow is 46% of current liabilities.

E. NET WORKING CAPITAL RATIO

$$\begin{aligned} \text{Net Working Capital Ratio} &= \frac{\text{Current Assets} - \text{Current Liabilities}}{\text{Total Assets}} \\ \text{Net Working Capital Ratio} &= \frac{\$4,882,000 - \$739,100}{\$6,032,000} \\ \text{Net Working Capital Ratio} &= 0.69 \end{aligned}$$

This means that the company's working capital is 69% of total assets.

Note: The current ratio, quick ratio, cash ratio, cash flow ratio and net working capital ratio will only be useful when compared to a benchmark such as the company's prior year performance, competitor's performance, industry standard and other reliable comparisons that are suitable for Solar Play Company.

A.2.2.2. Explain how changes in one or more of the elements of current assets, current liabilities, and/or unit sales can change the liquidity ratios and calculate that impact

Liquidity ratios are affected by the elements of current assets, current liabilities and/or unit sales.

Current assets, such as cash, marketable securities, accounts receivable, inventory and prepaid expenses, directly affect either some or all of the liquidity ratios.

- a) Cash affects virtually all liquidity ratios.
- b) Marketable securities affect the current ratio, quick asset ratio, cash ratio and the net working capital ratio.
- c) Accounts receivable affect the current, quick asset ratio and net working capital ratio.
- d) Inventory and prepaid expenses affect the current ratio and net working capital ratio.

Current Liabilities is the denominator of all liquidity ratios except for the Net Working Capital. Changes in current liabilities, such as accounts payable, short-term notes payable, accrued expenses, and the current portion of long-term debt, will generally affect the resulting liquidity ratio.

Unit sales have an indirect impact on liquidity ratios. When unit sales increase, inventory and accounts payable may increase to satisfy sales requirements. Also, whenever credit sales or cash sales increase, current assets, and quick assets increase.

Comprehensive Illustration:

Water Company has current assets of \$200,000 and current liabilities of \$100,000, while quick assets amount to \$125,000.

Required:

What will be the new current ratio and quick ratio if the company purchases \$100,000 worth of inventory on account assuming the company uses the perpetual method of inventory (rounded off to two decimal places)?