CHAPTER TWO

ANALYSIS OF THE STATEMENT OF CASH FLOW AND FINANCIAL RATIO ANALYSIS

"Patience is the best remedy for every trouble."
Plantus, Titus Maccius (c. 254- 184 B.C.)

"Be not afraid of going slowly; be only afraid of standing still."
Chinese Proverb

Learning Objective

The Statement of Cash Flow provides valuation analysts with valuable information about an entity's operating investment and financing cash flows. This Chapter provides readers with a review of how the same is derived. NACVA Instructors will only discuss the difference between the Cash from Operations (CFO) and the Cash Flows used for Valuation Purposes.

An understanding of the different methods used to derive a Statement of Cash Flow is presumed in this course.

IMPORTANT: The Cash Flows used for Valuation Purposes are Net Cash Flow to Invested Capital and Net Cash Flow to Equity!

CFO is not the Cash Flow used for business valuation purposes! Nevertheless it is important to understand how the same is derived. Once that is understood, it is far easier to understand the differences between various types of Cash Flows and easier to understand the cash flows used for valuation purposes.

Neither CVA nor AVA Candidates will be tested on the Derivation of the Statement of Cash Flows!

In this Chapter, financial ratios are covered, too; many ratios are based on historical data, and other ratios rely on cash flow. The ratios presented are just some of the many used/ developed and should be understood.

Candidates will be tested on the non-Cash Flow Financial Ratios, not on the ratios containing Cash Flow from Operations (CFO) or Free Cash Flow (FCF).

In Corporate Valuation Transactional Analysis (CVTA), NACVA's Day 5 of the Training Center (TC), reference is made to various types of Cash Flows. Accordingly, at this stage familiarity with these concepts is highly recommended, those practicing will need to be proficient and at ease using these financial concepts.

I. FINANCIAL RATIO (TREND) ANALYSIS SUMMARY

In general, a thorough financial analysis of any business would include a study of the following financial information:

a. A summary of both the historical and the adjusted economic/ normalized balance sheets over the period being analyzed, detailing each balance sheet line item.
b. A summary of both the historical and the economic/normalized adjusted income statements over the period being analyzed, detailing each income statement line item.
c. A summary of both the historical and the economic/normalized adjusted income statements over the period being analyzed, where each income statement line item is reported as a percentage of net sales (often referred to as common size analysis).
d. A summary of both the historical and the economic/normalized adjusted cash flows from operating activities (on the basis of operations and adjusted for owner/manager discretionary items such as compensation) over the period being analyzed.
e. A summary of the five main categories of selected financial ratios over the period being analyzed:
    1. Internal liquidity ratios
    2. Operating efficiency ratios
    3. Operating profitability ratio
    4. Business (operating) risk analysis ratios
    5. Financial risk (leverage) analysis ratios
f. The valuation analyst should then compare the aforementioned ratios for the subject company to those for other specific businesses or to an industry average.

II. COMMON-SIZE ANALYSIS

The conversion of balance sheet and income statement line items to percentages of a total is often referred to as placing the statements on a "common-size" basis. For purposes of common-size statements, balance sheet line items are presented as a percentage of total assets and income statement line items are presented as a percentage of total net sales or gross revenue.

Converting the subject company's balance sheets and income statements to a common-size basis assists the analyst by identifying internal trends. Common-size statements also facilitate comparison with other companies in the same industry. A comparison with another company's, or other companies', data if done on the basis of absolute dollar amounts, would be very confusing and inefficient without common-size analysis. Likewise, comparisons with industry averages are facilitated and made more efficient by using common-size analysis.

Because common-size financial statement analysis is based on relative terms, it removes the confusion that prevails when exact dollar values are used. It is also a fundamental step in developing ratio (trend) and comparative analyses.

III. RATIO (TREND) ANALYSIS

A. OVERVIEW

Financial ratios are measures of the relative health, or sometimes the relative sickness of a business. A physician, when evaluating a person's health, will measure the heart rate, blood

pressure and temperature; whereas, a financial analyst will take readings on a company's growth, cost control, turnover, profitability and risk. Like the physician, the financial analyst will then compare these readings with generally accepted guidelines. Ratio analysis is an effective tool to assist the analyst in answering some basic questions, such as:

1. How well is the company doing?
2. What are its strengths and weaknesses?
3. What are the relative risks to the company?

Please note that although an analysis of financial ratios will help identify a company's strengths and weaknesses, it has its limitations and will not necessarily provide the solutions or cures for the problems it identifies. For instance, off balance sheet financing techniques are not included or reflected in the balance sheet. The off- balance sheet techniques referred to here include:

1. The use of operating leases (vis-à-vis- capitalized lease)
2. Use of finance affiliates
3. Sales of receivables
4. Use of securitization
5. Take-or-pay and throughput contracts
6. Use of joint ventures
7. Guaranteeing the debt of affiliates

In addition, historical financial data has limitations since the subject firm can:

1. Record questionable revenue
2. Record revenue too soon
3. Record sham revenue
4. Record one-time gains to boost income
5. Shift expenses either to an earlier or later period
6. Under-report or improperly reduce liabilities
7. Shift revenues to the future
8. Take current charges to shift future expenses

These "tricks" are not covered in the Training Center material.

To make the most effective use of financial ratios, the ratios should be calculated and compared over a period of several years. This allows the valuation analyst to identify trends in these measurements over time. These ratios can also be compared to specific companies or to industry averages or norms in order to see how the subject company is performing relative to other businesses in the industry for the same period of time.

Once the analyst has obtained the GAAP basis and/or tax basis balance sheets and income statements and has prepared a summary of the historical economic/normalized balance sheets and income statements, then an analysis of the key financial statement ratios can be undertaken.

B. APPLICATION OF RATIO ANALYSIS

1. An Analysis of Financial Ratios is a Useful Tool for Business Valuations
   a. Integral tool in trend analysis
      1) Compares the company's own ratios to itself over time
      2) Identifies the company's strengths and weaknesses
      3) Assists in establishing appropriate capitalization rates (helps to identify risk factors particular to the subject company)
   b. Integral tool in comparative analysis:
      1) Assists in making comparisons with other companies' or industry averages
      2) Assists in selecting appropriate price/earnings ratios or price/asset multiples relative to the company's indicated performance to comparable companies or industry averages
2. Uses historical data
   a. Preferably for five years or alternatively, the length of the natural business cycle of the subject company and industry
   b. More than five years when the analyst deems appropriate
   c. Less than five years when the analyst uncovers unavailability of information, unusual fluctuations or a specific valuation purpose

> **Practice Pointer**
>
> **Management will, more often than not, provide legal counsel or the business valuation analyst with un-audited financial statements. If the valuation analyst relies on un-audited data, that fact must be expressly stated in the report as a scope limitation.**

3. Steps in Trend Analysis
   a. Obtain and analyze GAAP basis or tax basis financial data.
   b. List and prepare summaries by year for key financial statement accounts (both balance sheet and income statement items).
   c. Select, compute and compare the relevant financial ratios spread out by year for each ratio.
   d. Analyze and develop conclusions. This analysis will highlight questionable or unusual items to be discussed with management for clarification or potential adjustment.
4. Observation

   The most effective way to compare and analyze several years of financial data is to prepare a spreadsheet, either standalone or by using a valuation software program that lists the description of the financial data and the respective years. The majority of software programs list the descriptions vertically and the years (or other timing) horizontally, allowing easy side-by-side comparisons of fiscal information.

IV. KEY FINANCIAL RATIOS

The thorough valuation analyst will consider and compute five categories of ratios.

1. Internal liquidity ratios
2. Operating efficiency ratios
3. Operating profitability ratios
4. Business (operating) ratios
5. Financial risk (leverage) analysis ratios

The following section provides a summary of the five categories of financial ratios, along with descriptions of how each ratio is calculated and its relevance to financial analysis. Remember, the ratios themselves may not be entirely meaningful unless used in trend analysis or comparative analysis.

A. INTERNAL LIQUIDITY RATIOS

The internal liquidity ratios (also referred to as solvency ratios) measure a firm's ability to pay its near-term financial obligations.

1. Current Ratio

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

This ratio provides a good measure of solvency if accounts receivable and inventories are liquid

2. Quick Ratio

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

If inventories are not easily liquidated, the quick ratio provides a better indicator of the firm's financial solvency vis-à-vis the current ratio.

3. Cash Ratio

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

The cash ratio is the most conservative measure of solvency; it is used if neither accounts receivables nor inventories are liquid.

4. Turnover Ratios: Receivables turnover, inventory turnover, and payables turnover.

Receivable Turnover (# of turns)

$$\text{Receivable Turnover} = \frac{\text{Net Sales}}{\text{(Beginning A/R + Ending A/R} \div 2)}$$

This calculation finds the ratio between the net sales for the period and the average balance in accounts receivable. This is a rough indication of the average time required to convert receivables into cash. Ideally, a monthly average of receivables should be used and only sales on credit should be included in the sales figure. The interpretation of the average age of receivables depends upon a company's credit terms and the seasonable activity immediately before year–end. If a company grants 30 days credit terms to its customers,

for example, and a turnover analysis indicates average turnover of 41 days, then accounts receivable collections are lagging. If the terms were for 60 days, however, it appears collections are being made ahead of schedule. Note, if the sales volume in the last month of the year is unusually large, the average age of receivables as computed above can be misleading.

5. Inventory Turnover (# of turns)

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold}}{(\text{Beginning Inventory} + \text{Ending Inventory} \div 2)}$$

The relationship between inventory turnover and the gross profit rate may be important. A high inventory turnover and a low gross profit rate frequently go hand in hand. This, however, is merely another way of saying if the gross profit rate is low a higher volume of business is necessary to produce a satisfactory return on total assets. Although, a high inventory turnover is usually regarded as a good sign, a rate that is high in relation to that of similar firms may indicate the company is losing sales by failing to maintain an adequate stock of goods to serve its customers promptly.

High inventory turnover can indicate better liquidity or superior merchandising. Conversely, it can indicate a shortage of needed inventory for sales. Low inventory turnover can indicate poor liquidity, possible overstocking or obsolete inventory. In contrast to these negative interpretations, however, a planned inventory buildup may be occurring to avoid material shortages.

6. Payables Turnover

$$\text{Payables Turnover} = \frac{\text{Cost of Goods Sold}}{(\text{Beginning AP \& Ending AP.}) \div 2}$$

Payables turnover provides an indication of how a firm is perceived by its vendors. If the ratio is too high, the firm is too good a customer for its vendor (or it pays too quickly). If the ratio is low, then the firm may be a credit risk.

7. Cash Conversion Cycle

Cash Conversion Cycle	=	Inventory Processing Period	+	Days to Collect Receivables	–	Payable Payment Period

The cash conversion cycle measures the time between the outlay for cash and cash recovery.

B. OPERATING EFFICIENCY RATIOS

1. Net Fixed Asset Turnover (# of turns)

$$\text{Net Fixed Asset Turnover} = \frac{\text{Net Sales}}{(\text{Beginning F/A} + \text{Ending F/A}) \div 2}$$

This ratio is an indication of management's ability to effectively utilize fixed assets.

2. Total Asset Turnover (# of turns)

$$\text{Total Asset Turnover} = \frac{\text{Net Sales}}{(\text{Beginning Total Assets} + \text{Ending Total Assets}) \div 2}$$

This ratio is an indication of management's ability to effectively utilize total assets, however, it is important to note the asset turnover ratio can be affected by factors other than a firm's efficiency. A firm with newer and less depreciated assets will cause the ratio to fall relative to the firms with older or more depreciated assets.

C. OPERATING PROFITABILITY RATIOS

Operating ratios are used in the evaluation of management performance.

1. Cost of Sales/Sales (%)

$$\text{Cost of Sales} = \frac{\text{Cost of Sales}}{\text{Sales}}$$

This ratio is an indication of the subject company's operating environment and operating efficiency. For example, if the company's cost of sales/sales ratio is increasing, it may indicate competition is forcing the company to cut profit margins or it may indicate the company is unable to pass its increasing costs to its customers.

2. Gross Margin (%)

$$\text{Gross Margin} = \frac{\text{Net Sales - Cost of Sales}}{\text{Net Sales}}$$

This ratio expands on the issues found by analyzing the cost of sales ratio.

3. Operating Expenses/Sales (%)

$$\text{Operating Expenses} = \frac{\text{Operating Expenses}}{\text{Net Sales}}$$

Management generally has greater control over operating expenses than it has over revenue. This ratio is often used as a measure of management's ability to control its operating expenses.

4. Operating Margin (%)

$$\text{Operating Margin} = \frac{\text{Income from Operations}}{\text{Sales}}$$

This ratio expands on the issues found by analyzing the operating expense ratio.

5. Return on Assets (%) (ROA)

$$\text{ROA} = \frac{\text{Net Income}}{(\text{Beg. Total Assets} + \text{Ending Total Assets}) \div 2}$$

This ratio is an important test of management's ability to earn a return on funds supplied from all sources. The income figure used in computing this ratio should be **income before deducting interest expense,** since interest is a payment to creditors for funds used to acquire assets. Income before interest reflects earnings throughout the year, therefore it should be related to the average investment in assets during the year.

6. Return on Equity (%) (ROE)

$$\text{ROE} = \frac{\text{Net Income}}{(\text{Beg. Common Equity} + \text{Ending Common Equity}) \div 2}$$

Because interest and dividends paid to creditors and preferred stockholders respectively are fixed in amount, a company may earn a greater or smaller return on the common stockholders' equity than on its total assets.

Financing with fixed-return securities is often called trading on the equity. Results may be favorable or unfavorable to holders of common stock. For example, if the rate of return on total assets is **greater** than the average rate of payment to creditors and preferred stockholders, the common stockholders will **gain** from trading on the equity.

D. RISK ANALYSIS

1. BUSINESS RISK

Business risk refers to the volatility of earnings over time. There are three ratios (two of these require knowledge of basic statistics to derive) used to asses the business risk.

a. Coefficient of Variation of Operating Income (EBIT)

7. Coef. Of Var. Operating. Inc. = σ[1]EBIT/μ[2]EBIT

Valuation analysts will usually compute the coefficient of variation (C of V); data from one or more one business cycles is used to derive the data for the formula. [In day 3 (case) and day 5 (CVTA) the C of V will be allowed, too!]

b. Sales Volatility

$$\text{Coef. Of Sale Volatility} = \frac{\sigma\text{Sales}}{\mu\text{Sales}}$$

Again, sales volatility is measured in one or more business cycles.

c. Degree of Operating Leverage (DOL)

$$\text{DOL} = \frac{\%\Delta\text{EBIT}}{\%\Delta\text{Sales}}$$

DOL measures the risks of operations of the business. It is important to note that DOL is independent of the risk that is due to financial leverage.

Practice Pointer

- **Statement of Cash Flows was covered earlier in this chapter. Financial Risk Ratios make extensive use of operating cash flows (often this term is referred to as Cash Flow from Operations (CFO).**
- **Operating Cash Flow is not the same as EBITDA; EBITDA does not capture changes in working capital (inventories, receivables, etc.). In Corporate Valuation and Transactional Analysis (CVTA), offered in Day 5 of NACVA's TC CFO is often alluded to during that course.**

[1] σ – is the symbol for the standard deviation
[2] μ - the symbol for the Mean (or average). **Note**. It is important to recognize that there is a difference between the mean and median, notwithstanding that these numbers may be the same.

2. FINANCIAL RISK (LEVERAGE) RATIOS

The inclusion of debt in a firm's financial structure increases its earnings volatility in relation to sales. Financial leverage ratios should be interpreted in conjunction with a firm's operating leverage (DOL) and sales volatility.

As a general rule, valuation analysts will see that firms with high DOL and sales volatility tend to have low financial leverage ratios, while firms with low DOL and sales volatility tend to have high financial leverage ratios.

a. Long-Term Debt-to-Equity Ratio (or Debt/ Equity Ratio)

$$\text{Debt/Equity} = \frac{\text{Long-Term Debt \& Deferred Tax Liabilities}}{\text{Total Equity}}$$

This ratio is controversial. Some valuation analysts will exclude deferred tax liabilities if they believe these liabilities will grow and not be paid. Some analysts will include the effect of operating leases, especially if the lease should have been capitalized.

b. Total Debt-to-Total Capital Ratio

$$\text{Debt/Capital} = \frac{\text{Current Liabilities + Long-Term Debt}}{\text{Total Liabilities + Total Capital}}$$

This ratio measures what percentage of a firm's assets is financial with debt.

c. Interest Coverage (factor)

$$\text{Interest Coverage} = \frac{\text{Earnings Before Interest and Taxes (EBIT)}}{\text{Interest Expense}}$$

This ratio is a measure of a firm's ability to meet its interest payments. A high ratio may indicate a borrower would have little difficulty in meeting the interest obligations of a loan. This ratio also serves as an indicator of a firm's capacity to take on additional debt.

d. Operating Cash Flow Ratio (OCF Ratio or CFO Ratio)

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

This ratio measures a firm's ability to generate the resources required to meet its current liabilities.

e. Operating Cash Flow to Long- Term Debt (OCF/ LTD)

$$\text{OCF/LTD} = \frac{\text{OCF}}{\text{Book Value of Long-Term Debt + PV of Lease Obligations}}$$

This ratio measures the ability to pay debt service to total debt.

f. Operating Cash Flow to Total Debt Ratio (OCF/ TD)

$$\text{OCF/TD} = \frac{\text{OCF}}{\text{Total Long-Term Debt + Current Interest Bearing Liabilities}}$$

This ratio measures the ability to service total debt to the total amount of short-term and long-term debt.

Practice Pointer

It is important to distinguish FCF, CFO, FCFF, and FCFE (the latter two, which were defined earlier, are discussed in more detail in Chapter 4 of the FT&T, Day 3 (Case), and Day 5 (CVAT).

V. COMPARATIVE ANALYSIS

Comparative analysis uses information gleaned from the two previous sources, common-size analysis and ratio "trend" analysis. As indicated by its title, comparative analysis involves comparison of the subject company's status and performance with those of specific other companies or industry averages. Comparative analysis can involve either a comparison over a historical period of more than one year or over the latest complete 12-month period.

A. SOURCES OF INFORMATION

In many cases, specific company data for comparison is not available, and the analyst will need to use general industry information. Some of the most common sources for general industry information are:

1. Almanac of Business and Industry Ratios from Prentice Hall, Inc.
2. Annual Statement Studies from Risk Management Associates
3. Integra statistics by industry
4. IRS statistics from corporate tax returns
5. Key Business Ratios from Dun & Bradstreet, Inc.
6. Specific industry statistics from industry associations

B. QUALITY OF INFORMATION

In constructing a comparative analysis, the method of accounting for both the subject company and the comparison company or companies should be consistent. This is often very difficult to establish, unless the provider of the information adequately discloses the method of accounting for the comparison. In addition, the following considerations have become generally accepted as important checklist components to ensure that a specific company comparison is meaningful.

1. Companies must be of similar size, relative to sales volume and total assets.
2. Companies must have similar historical and current levels of profitability.
3. Companies must have similar competitive positions within the industry.
4. Companies must be in the same or similar line of business.
5. Companies must have similar historical rates of growth.
6. Companies must have similar capital structures.
7. Companies must offer a similar product line.

C. STEPS IN COMPARATIVE ANALYSIS

(ASSUME COMPARISON WITH DATA FROM INTEGRA OR RISK MANAGEMENT ASSOCIATES – RMA) (for illustrative purposes this section will rely on RMA Data; the use of RMA should not be construed as a preference of RMA over Integra)

1. Determine results of selected key financial ratios of the subject company for the latest 12-month period.
2. Determine the appropriate SIC# (Standard Industrial Classification) of the subject company.
3. Obtain RMA "Financial Statement Studies" for appropriate SIC number and prepare a worksheet that lists subject company financial ratios, RMA financial ratios, and the differences between the two. **NOTE**: RMA data is gathered from financial information submitted to banking and other financial institutions to secure credit.
4. Analyze the comparative ratios and draw conclusions relative to:
    a. Utilization of assets
    b. Profitability
    c. Leverage
    d. Liquidity
5. RMA data is gathered from financial information submitted to banking and other financial institutions to secure credit. Integra is primarily obtained from tax returns.

Financials Folder from BVMPro – showing what is available within the software. Using this software developed by valuation analysts for valuation analysts makes your task much easier.

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In addition to the foregoing chapter of Fundamentals, Techniques and Theory, there are other sources of information, which many professionals in the valuation business have read and/or added to their library. The valuation analyst, progressing through the steps in a valuation, should be generally familiar with the body of knowledge represented by this text and other publications. These can include books, papers, articles, seminars, classes and the experience of a valuation mentor or other business mentor the valuation analyst may know. Those at the top of the field continue to grow. Recommended reading includes, but is not limited to:

- Blackman, Irving L., *Valuing Your Privately Held Business, The Art & Science of Establishing Your Company/s Worth*.
- Campbell, Ian R., and Howard E. Johnson, *The Valuation of Business Interests*, Chapter 3 (Business Analysis).
- Copeland, Tom, Tim Koller, and Jack Murrin, *Valuation: Measuring and Managing the Value of Companies*.
- Damodaran, Aswath, Damodaran on Valuation, *Security Analysis for Investment and Corporate Finance*, Chapter 5 (Estimation of Growth Rates) and Chapters 10 through 12 (Ratios).
- Dun & Bradstreet, Inc. *Industry Norms and Key Business Ratios*, select by appropriate year.
- Fridson, Martin and Fernando Alvarez, *Financial Statement Analysis: A Practitioner's Guide*.
- Green, Robert, Using Correlation Analysis in Determining Proper Method to Project Earnings, *The Valuation Examiner*, 1st qtr, 1994.
- Helfert, Erich A., *Techniques of Financial Analysis*, Chapter 1, Part III (The Nature of Financial Statements), and Chapter 3 (Assessment of Business Performance – Ratio Analysis and Performance).
- Hitchner, James R., *Financial Valuation Applications and Models*, Chapter 3 (Financial Statement and Company Risk Analysis).
- Pratt, Shannon P., R. F. Reilly and R. P. Schweihs, *Valuing a Business, The Analysis and Appraisal of Closely Held Companies*, Chapter 8 (Financial Statement Analysis).
- Risk Management Associates, *Annual Statement Studies*, select by appropriate year.
- Rufus, Robert, "Financial Ratios: Use, Predictive Power and the Z-Score," *The Valuation Examiner*, May/June 2003.
- Rufus, Robert, Financial Ratios: Use, Predictive Power and the Z-Score, *The Valuation Examiner*, M/J 2003.
- Rutter, Grover, A Matter of Equity: The Old Safe-Rate Method Yard Stick for Measurement, *The Valuation Examiner*, F/M 1999.
- *Statistical Abstract of the United States*, select by appropriate year.
- Troy, Leo, *Almanac of Business and Industry Ratios*, select by appropriate year.

PARTICIPANT NOTES

BUSINESS VALUATIONS:

FUNDAMENTALS, TECHNIQUES AND THEORY (FT&T)

CHAPTER 2
REVIEW QUESTIONS

FT&T

EXAM REVIEW QUESTIONS

Chapter 2: Analysis of the Statement of Cash Flow and Financial Ratio Analysis

(Reminder: The Exam will not only test candidates on the derivation of Statement of Cash Flows; Candidates should know those financial ratios that do not refer to FCF, OCF or other Cash Flows in the Numerator)

There are no test questions for Chapter Two.