

An Introduction to the Financial Statement Analysis



CONTENTS

CONCEPT AND METHODS OF THE FINANCIAL STATEMENT ANALYSIS	3
UNDERSTANDING THE FINANCIAL STATEMENTS OF A COMPANY	6
ACTIVITY RATIO ANALYSIS	12
PROFITABILITY RATIO ANALYSIS	17
LIQUIDITY OF SHORT-TERM ASSETS AND LIQUIDITY RATIO ANALYSIS	22
LONG-TERM DEBT-PAYING ABILITY AND DEBT RATIO ANALYSIS	26
DUPONT ANALYSIS AS A METHOD OF MEASURING COMPANY'S PROFITABILITY	30
FORECASTING FINANCIAL DISTRESS WITH ALTMAN Z-SCORE MODEL	32
FINANCIAL RATING ANALYSIS	34
APPENDIX	36

CONCEPT AND METHODS OF THE FINANCIAL STATEMENT ANALYSIS

Aiming to detect changes in the company's development trends in order to make more successful economic decisions, the financial statement analysis (also referred as the financial analysis of enterprise) is the process of analyzing and reviewing firm's balance sheet (statement of financial position), income statement (profit and loss report) and other statements. It allows to estimate the company's overall performance by calculating and comparing a complex of indicators, building the trend lines and making conclusions on the business health and sustainability. The motivation for applying the financial statement analysis to the annual report of a company is different for each group of users. Creditors are normally interested in estimating the creditworthiness of borrowers, investors want to measure the revenue their potential investments can bring, and managers are willing to have the most precise information on the financial position and performance of their companies.

Despite apparent difference in motivation, all the above-mentioned users have common objectives in the financial statement analysis. They are following:

1. *Reviewing the company's performance over past periods.* Building the trend lines, calculating ratios and indicators with the use of the company's past financial report is a key to making conclusions on its possible future performance. For creditors and investors reviewing the profitability, activity and liquidity ratios from previous periods can be a base for consideration of their further cooperation with a firm, while for the company managers it may be a reason for some serious economic decisions.

2. *Assessing the current financial position.* Analyzing company's current balance sheet and income statement is the most effective way to estimate the condition of a company here and now. Reviewing firm's assets and liabilities, checking the profitability margins for the current period is necessary for all the users in terms of operative and long-term decision making.

3. *Forecasting the profitability trends.* As the main goal of every business is the generation of revenue for its owners and investors, planning the company's cash flows and using analytical methods of forecasting the profitability is highly important for every user of financial analysis. Profitability forecasts is a strong base for investors' consideration of the alternative ways of using their funds.

4. *Forecasting financial failure.* One of the most important assumptions that can be made during the analysis of the company's financial report is measuring a chance of its

possible bankruptcy. This factor is vital to a business, and thus should be under a tight control of company's management, while for investors and creditors financial distress forecasts work as a warning sign.

There are two key methods of the financial statement analysis. First includes an application of the horizontal and vertical analysis to the financial statements of a firm, second is a process of miscellaneous financial ratios calculation.

Horizontal financial statement analysis means the comparison of the information from the financial report of a company over some certain time periods. Both the financial information and the ratios derived from it can be compared. In other words, horizontal analysis (very often referred as *trend analysis*) is reviewing and comparing the dynamics of the same indicators and making conclusions on company's performance over time. As said before, this analysis method may be applied the financial statement information itself and to ratios derived from it, so the horizontal analysis may include either absolute values comparison or percentage comparison. Ratios and indicators of a company can also be compared to average values in the economic sector or values of competitors.

Vertical analysis is a process of comparison of one item to the base item. Commonly, the vertical analysis is conducted for the financial statement of a single period (unlike the horizontal analysis, which is reviewing information over at least two different periods of time, or more). Also referred as common-size analysis, vertical analysis commonly means usage of total assets or total liabilities or shareholders' equity as base figures of the proportion. Main reason for performing the vertical analysis for one single period is seeing the relative proportions of different elements of assets and sources of finance.

The second method of the financial statement analysis is ratios calculation and interpretation. Many ratios showing the relative size of one number in relation to another exist, and being able to measure them and see their dynamics over time is extremely useful in terms of understanding firm's performance and position.

Most of the ratios can be calculated from the information obtained from the company's financial statements. They can be used for analyzing trends and comparing firm's financial condition with previous periods or with other firms. Normally, financial ratios can also be a base for predicting the company's possible insolvency or bankruptcy.

However, use of financial ratios has some limitations, such as following:

- A comparison with previous periods or similar-sized companies should be made, since most ratios by themselves do not provide enough information to make conclusions;

- When available, average values should be used for calculations, since year-end values may not be representative.

All ratios used in the process of the financial statement analysis can be grouped to sets, depending on their goal. Each set allows to approach firm's performance from a different angle and in complex they provide an analyst with a full understanding of the company's financial condition.

Ratio Group	Goal	Examples
Liquidity Ratios	Measurement of the firm's short-term debt-paying ability	Current ratio Quick ratio Cash ratio Liquidity index
Activity Ratios	Measurement of the company's efficiency	Total asset turnover Accounts receivable turnover Accounts collection period Accounts payable turnover Days payable outstanding Inventory turnover
Profitability Ratios	Measurement of the company's earning ability	Net profit margin Return on equity Return on assets
Financial Sustainability Ratios	Measurement of the firm's long-term debt-paying ability and estimating bankruptcy risks	Times interest earned Debt ratio Debt to equity ratio Debt to tangible net worth ratio

Table 1. Groups of the financial statement analysis ratios

In assumption it can be stated that financial statement analysis means usage of different methods of emphasizing the comparative and relative importance of the data, presented in the financial report of a company to evaluate the company's performance and position. These methods include horizontal and vertical analysis, calculation of various ratios, studying and interpreting their values to make right conclusions on the business.

UNDERSTANDING THE FINANCIAL STATEMENTS OF A COMPANY

Most of the companies are interested in providing their existing and potential investors with actual information on its performance and financial position. This is commonly being done through a complex report on firm's activities and financial condition over the year called annual report. Usually, it is being issued to company's stockholders and creditors after the end of a fiscal year. Different regulatory organizations also are the users of the annual report analysis.

Typically company's annual report consists of the introduction section, balance sheet, profit and loss report, cash flow statement and notes to the financial statements. Sometimes it also includes some other components, such as chairperson's statement, director's report or auditors' report.

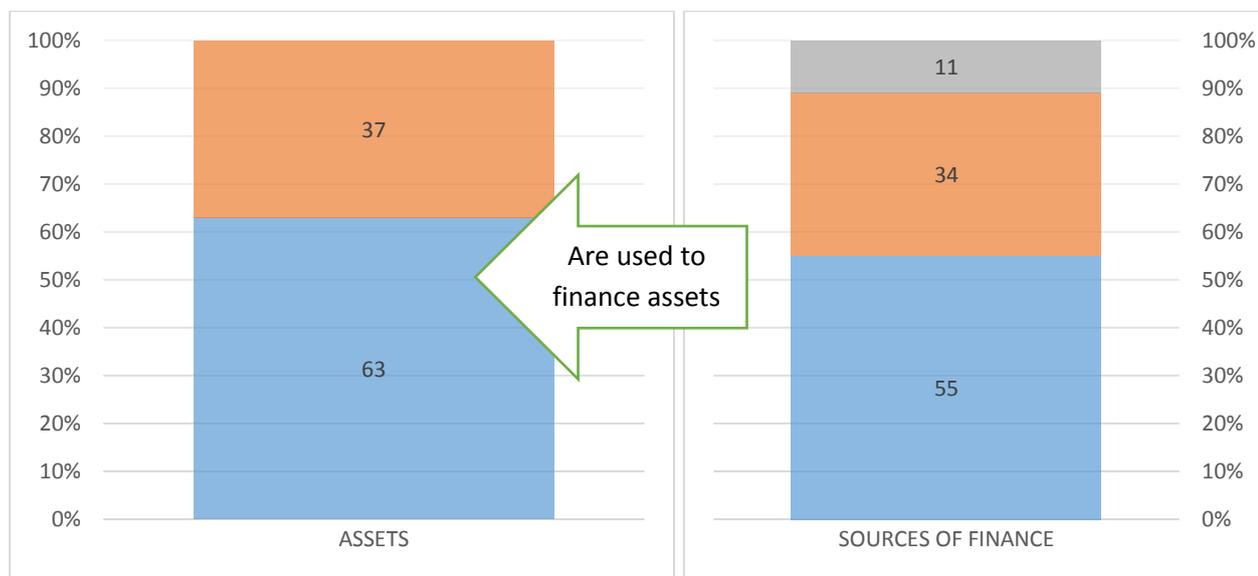


Chart 1. Assets and sources of finance

Balance sheet is one of the most important statements of a company. Also referred a statement of financial position, it contains information about company's total assets, liabilities and shareholders' equity as of the date stated. The information from the balance sheet is commonly used for performing the analysis of company's liquidity, financial sustainability and other indicators. Main information indicating firm's financial condition as of the date stated can be found in its balance sheet. It summarizes company's debts and assets, and the stockholders' equity. Actually, whole balance sheet is based on one simple equation:

$$\text{Assets} = \text{Source of Finance (Liabilities + Stockholders' Equity)}$$

As creditors' and company owners' funds are two main sources of financing company's assets, at any time firm's assets must equal the sum of its liabilities and equity.

Assets are the resources of a company, including physical resources, such as buildings, materials, equipment, etc.; and also intangible, such as trademarks, or patents. Normally, assets are categorized into current (also referred as short-term) and noncurrent (long-term).

Current are assets, which can by expectations be converted to cash within one operating cycle (or year). Often their listing in the balance sheet is being made in order of their liquidity. They include:

1. *Cash (and its equivalents)*. This is an asset with the highest liquidity. Treasury bills, bank deposits and other money market instruments are also included to this entry of the statement of financial position.

2. *Accounts Receivable*. This entry summarizes the amount of money, which a company has a right to receive for providing its customers with goods or services. The amount reflected commonly only includes the amount of money that is expected to be collected. Long overdue or uncollectible accounts are not shown in this entry of the balance sheet.

3. *Inventories*. Inventories include materials for production, work-in-progress products and ready products that the company is planning to sell in future. Supplies like pencils, envelopes, folders are also included to inventories.

4. *Marketable Securities*. This is the entry, where short-term investments with a very high level of liquidity are listed. The reason for holding marketable securities for a firm is earning a return on near-cash resources.

5. *Other current assets*. All other assets, convertible into cash within a business cycle, or a year (prepaids, etc.).

Noncurrent are assets, which take longer than an operating cycle to be converted to cash and they include:

1. *Buildings and equipment*. This type of assets is also classified, as fixed assets. They include buildings, land, machinery, constructions in progress and all the other tangible assets, which are owned by a company and being used in goods or services production process from one business cycle to another.

2. *Intangible Assets*. This is a type of noncurrent assets in company's ownership that aren't in physical form and their conversion to cash takes longer than a business cycle (or year). These assets include patents, copyrights, trademarks, licensing agreements, franchises and others.

3. *Long-Term Investments*. These are such kind of investments, as bond or preferred stock, which are made for a period over 10 years. The main difference between them and

short-term investments is liquidity level. While short-term investments are relatively easily convertible to cash, long-term investments are difficult to sell.

4. *Other noncurrent assets.* Liabilities are reflected in company's balance sheet obligations to provide goods or services, or transfer assets to other firms. Being a result of the past transactions, firm's liabilities are also divided into current liabilities and long-term liabilities.

Current liabilities are obligations due within one business cycle (or year). The liquidation of current liabilities most likely would require the use of company's current assets, or creating other current liabilities by involving some short-term loans. Following items are included:

1. *Accounts Payable.* These are accounts, which were created by the acquisition of some goods or services and should be paid by a company in the near time.

2. *Unearned Income.* Unearned income includes money received in advance of selling a good or providing a service.

3. *Other current liabilities.*

Long-term liabilities are obligations due in a period more than a year, or alternatively, more than a business cycle. Balance sheet includes such kinds of long-term liabilities, as notes payable, bonds payable, capital lease obligations, postretirement benefit obligations, etc. Normally, they are classified as liabilities relating to financing agreements and operational obligations:

1. *Financial agreements relating liabilities.* This kind of liabilities include notes payable, bonds payable, credit agreements. These obligations most commonly require making regular payments of interest.

2. *Operational obligations relating liabilities.* These are obligations, connected with the operational activity of a firm. Most common kinds of operational obligations relating liabilities are pension obligations, deferred taxes, service warranties, etc.

Stockholders' equity (also very often being referred as net worth, or shareholders' equity) is an amount, representing shareholders' interest in firm's net assets. In other words, it shows the amount of money, by which a firm is being financed through the common and preferred stock. By applying some minor changes to the basic balance sheet equation we receive a formula for stockholders' equity computation:

$$\text{Stockholders' Equity} = \text{Total Assets} - \text{Total Liabilities}$$

There are two main sources of shareholders' equity. First is the paid-in capital, which includes all the investments into company that have been made, originally at the very

beginning and additionally thereafter. Retained earnings are the second source of the shareholders' equity, and they include all the earnings, that the company has been able to accumulate through its operations.

Paid-in capital is the total amount of money that has been invested into company during the issuances of common or preferred stock. While common stock represents ownership, having the rights of voting and liquidation, preferred stock usually do not have such rights. Main important decisions on the company, including electing the board of directors, are usually being made by the holders of common stock.

Paid-in capital may also include donated capital. It includes donations from stockholders, creditors and other parties.

Retained earnings represent that part of net earnings, that aren't being distributed by a company between the investors as dividends, but are being reinvested into business again, or into debts pay off. The formula for retained earnings calculation is as follows:

$$\text{Retained Earnings} = \text{Beginning Retained Earnings} + \text{Net Income} - \text{Dividends}$$

All the necessary information for calculation is available in company's balance sheet. Negative net income (net loss) would mean negative retained earnings.

Profit and loss report (often referred as P&L report, income statement, or statement of operations) is one of the primary reports in the system of enterprise accounting, which plays an important role in the financial statement analysis. It contains summarized information about firm's revenues and expenses over the reporting period. Most common are income statements that contain the quarterly and yearly information. The goal of the statement of income is to measure the profit of a business over the reporting period by excluding the expenses of a firm from its revenues.

The general form of P&L report starts with the revenue entry, from which the operative expense, salary, depreciation expense interest expense and other expenses are being subtracted to compute the net earnings in the end. The net earnings are presented as an absolute value, and also as the division of net earnings by the number of shares outstanding (earnings per share). Both horizontal and vertical analysis can be applied to the income statement; as the P&L report most commonly contains quarterly information, the ratios calculated can be analyzed in dynamics over some time and for some certain reporting period.

Basic elements of the profit and loss report are:

1. *Revenue (Net Sales)*. This entry represents the value of goods or services a company has sold to its customers. Commonly sales are presented net of different discounts, returns, etc.

2. *Cost of Goods Sold*. This element measures the total amount of expenses, related to the product creation process, including the cost of materials, labor, etc. Costs of goods sold include direct costs and overhead costs. Direct costs (materials; parts of product purchased for its construction; items, purchased for resale; labor costs; shipping costs, etc.) are the expenses that can be actually associated with the object and its production. Overhead costs (labor costs, equipment costs, rent costs, etc.) are the expenses that are related to the business running process, but cannot be directly associated with the particular object of production.

3. *Gross Profit*. Gross profit is net revenue excluding costs of goods sold.

4. *Operating Expenses*. Operating expenses include selling and administrative expenses. Selling are the expenses, which relate to the process of generating sales by a company, including miscellaneous advertisement expenses, sales commission, etc. All the expenses connected with company's operation administration, such as salaries of the office employees, insurance, etc., refer to the administrative expenses.

5. *Operating Income*. Operating income is gross profit excluding operating expenses.

6. *Other income or expense*. This entry contains all the other income or expense values, which weren't included to any of the previous entries. It may be dividends, interest income, interest expense, net losses on derivatives, etc.

7. *Income Before Income Taxes*. Income before income taxes is operating income including (or excluding) other income or expense.

8. *Income Taxes*. This entry includes all state and local taxes, which are based on the reported profit of an enterprise.

9. *Net Income*. Net income is the amount of money remaining after taking the net sales of a business and excluding all the expenses, taxes depreciation and other costs. In other words, this entry reflects the basic goal of an enterprise functioning – its profit. It is also often referred as net profit or net earnings. Following the net income in the profit and loss report is a very important part of the company's financial report analysis.

10. *Earnings Per Share*. This entry is often included at the end of P&L report. It reflects the net profit as its division by the total number of shares outstanding. The result is the amount of net profit, earned by one share of common stock. This measurement can be useful for the risk management of a stockholder.

Another primary statement of an enterprise is the **statement of cash flows**. Since cash is being one of the most important and liquid assets, all the managers, shareholders and analysts are interested in closely following firm's cash balances. This statement reports all transactions that affect the cash flow of a firm, including the most liquid assets. All the inflows

and outflows are being separated into different groups, which relate to operating activities, investing activities and financing activities.

Cash flow statement is also a basis for different ratios calculation. For a long time analysts used mainly the information from the balance sheet and income statement for the financial ratios calculation, but during few last decades the statement of cash flow has become an object of their close attention too. Most of the financial ratios, based on the cash flow statement information, detect the ability of the operating cash flow to cover company's debt, cash dividends, etc. Most commonly calculated are operating cash flow to total debt, operating cash flow per share, operating cash flow to cash dividends ratios.

All things considered, the annual report analysis can provide its user with a complete vision of company's performance and position. By analyzing different components of firm's annual report one can make conclusions on its liquidity, financial sustainability, debt-paying ability and other characteristics.

ACTIVITY RATIO ANALYSIS

To understand, if the company's use of assets and process of running the operations are efficient or not, the activity ratio analysis is applied. Also referred as operation ratio analysis, or turnover ratio analysis, it includes calculating a set of indicators that allow making conclusions on how effectively the firm uses its inventories, accounts receivable and fixed assets.

Activity Ratio Calculation and Analysis

Total Asset Turnover

A ratio that measures the assets activity and firm's ability to generate sales through its assets is total asset turnover. To compute it the net sales have to be divided by average total assets:

$$\text{Total Asset Turnover} = \text{Net Sales} \div \text{Average Total Assets}$$

It is obvious, that the higher this ratio, the better it is for a firm because this means it can generate more sales with some certain level of assets. Total asset turnover ratio can be compared with other similar-sized companies within the industry; the comparison with different industries businesses or noticeably smaller or greater firms wouldn't be adequate.

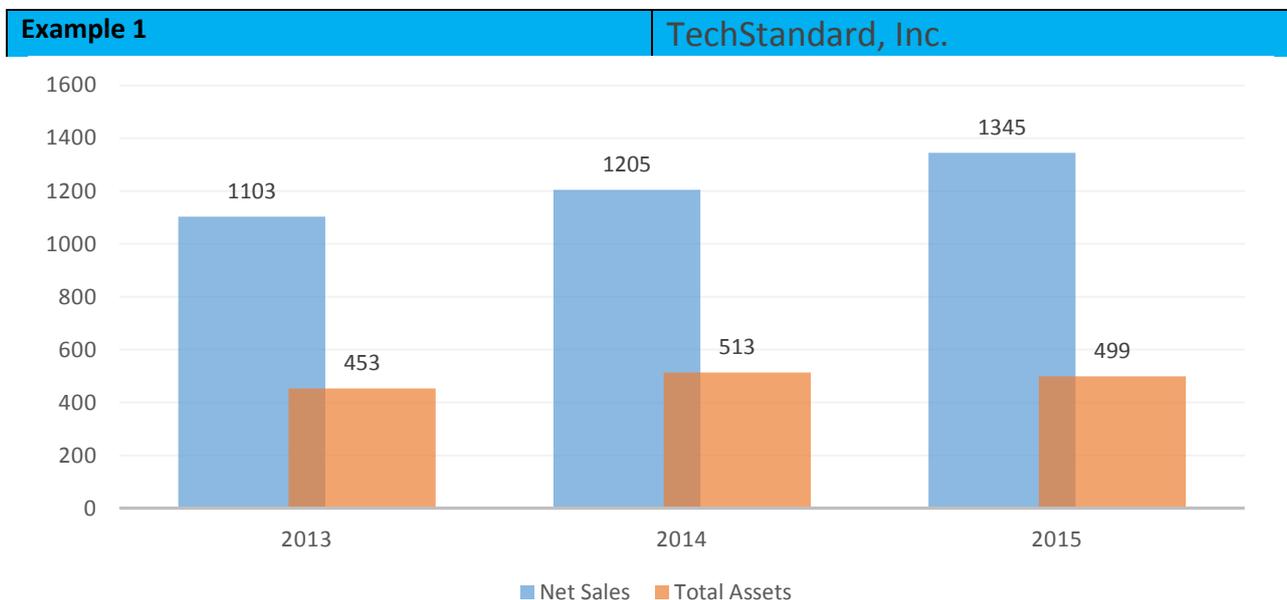


Chart 2. Financial data

The total asset turnover for 2015 equals $1345 / ((499 + 513) * 0,5) = 2,66$.

As for the year 2014 this ratio equals $1205 / ((513 + 453) * 0,5) = 2,49$.

This means that the use of assets was more intense in 2015 comparing to 2014. TechStandard produced and sold 2,66 dollars of products for every dollar of assets in 2015.

Current Asset Turnover

A ratio that measures the assets activity and firm's ability to generate sales through its assets is total asset turnover. To compute it the net sales have to be divided by average total assets:

$$\text{Current Asset Turnover} = \text{Net Sales} \div \text{Average Current Assets}$$

Bigger values for this ratios are preferable because this means the ability to generate more sales from some certain amount of current assets.

Working Capital Turnover (Sales to Working Capital)

The working capital turnover ratio, which is also being calculated while performing the liquidity analysis, has the following formula:

$$\text{Sales to Working Capital} = \text{Sales} \div \text{Average Working Capital}$$

This ratio measures the amount of cash needed to generate a certain level of sales. Considering this, high working capital most likely indicates a working capital profitable use. In other words, sales should be adequate in relation to the working capital available. However, a comparison with other similar companies or industry average should be made before drawing any conclusions.

Accounts Receivable Turnover

To measure how many times accounts receivable can be turned by a company into cash we should calculate the accounts receivable turnover ratio. This ratio indicating the liquidity of the accounts receivable can be computed as follows:

$$\text{Accounts Receivable Turnover (Times)} = \text{Net Sales} \div \text{Average Net Receivables}$$

The results of the calculations may be presented either in times per year, or in days. If measured in times per year the decreasing trend of this ratio would be negative for a company, meaning the ability to turn accounts receivable into cash has become lower. However, when measured in days, the decreasing trend of this ratio is desirable, because it would mean fewer days are needed to turn the receivables into cash. The formula for the calculation of the accounts receivable in days is slightly different:

$$\text{Accounts Receivable Turnover (Days)} = \text{Average Gross Receivables} \div (\text{Net Sales} \div 360)$$

Often referred as average collection period, the accounts receivable turnover in days can also be computed as follows:

$$\text{Average Collection Period (Accounts Receivable Turnover in Days)} = 360 \div \text{Accounts Receivable Turnover (Times)}$$

Basically, this indicator is measuring the number of days between the date credit sale has been made and the day, when the money has been received from the buyer.

Accounts Payable Turnover

This is another ratio that can be used for performing the activity analysis of a firm. In opposition to accounts receivable turnover, this ratio measures the number of times per year a company pays its debt to suppliers (creditors). It can be calculated as follows:

$$\text{Accounts Payable Turnover (Times)} = \text{Cost of Goods Sold} \div \text{Accounts Payable}$$

Higher accounts payable turnover ratio indicates the ability of a firm to pay its debt to creditors frequently and regularly. The alternative formula for this ratio is as follows:

$$\text{Accounts Payable Turnover} = \text{Purchases} \div \text{Average Accounts Payable}$$

Days Payable Outstanding

To measure the number of days that is averagely needed by a firm to pay the debt to its creditors, the days payable outstanding ratio is being computed. This can be done with use of the following formula:

$$\text{Days Payable Outstanding} = \text{Accounts Payable} \div \text{Average Daily Cost of Sales}$$

Generally, a low value of this ratio means efficient working capital usage. However, greater days payable outstanding ratio not necessarily indicates the bad position of a firm, because delaying payments to suppliers to the very last date can be made by a company regularly in order to shorten the cash converting cycle. Thus, the analysis should include reviewing the liquidity ratios too, because high days payable outstanding ratio and, at the same time, bad liquidity position of a company would indicate that it has problems paying its debt to creditors.

Inventory Turnover (Days Inventory Outstanding)

This ratio indicates how many days a firm usually needs to turn inventory into sales. The computation formula is as follows:

$$\text{Inventory Turnover (Days Inventory Outstanding)} = \text{Cost of Goods Sold} \div \text{Average Inventory}$$

Lower inventory turnover ratio would indicate that less time is needed for a company to turn the inventory to sales. Commonly, the decreasing trend of company's inventory turnover indicates its working capital improvement.

A formula for the computation of this ratio measured in days is as follows:

$$\text{Inventory Turnover in Days} = \text{Average Inventory} \div \text{Cost of Goods Sold} \div 365$$

This formula calculates a certain number of days needed for the inventory of a firm to be converted to cash. There is also an alternative formula for this ratio:

$$\text{Inventory Turnover in Days} = 360 \div \text{Inventory Turnover (Days Inventory Outstanding)}$$

Cash Turnover

The efficiency of company's usage of cash is indicated by the cash turnover ratio. It measures the amount of times that the firm's cash has been spent through over some period of time. The formula for calculating this ratio is as follows:

$$\text{Cash Turnover} = \text{Sales} \div \text{Average Cash and Cash Equivalents}$$

Normally, a high value of this ratio is considered to be better, because this would mean that the company is using its cash effectively and turning it over more frequently. However, in some cases high value ratio can indicate that the firm has insufficient funds and may soon require short-term financing. An alternative formula for this ratio also includes marketable securities to the calculation:

$$\text{Cash Turnover} = \text{Sales} \div \text{Average Cash and Cash Equivalents and Marketable Securities}$$

Operating Cycle

Operating cycle is the number of days needed by a company to turn its inventories to cash. In other words, it is a period between the date goods are acquired and the date of cash realization from sales. Normally, the operating cycle of a business lasts less than a year, however, exceptions exist. Operating cycle computation formula is as follows:

$$\text{Operating Cycle} = \text{Accounts Receivable Turnover in Days} + \text{Inventory Turnover in Days}$$

Cash Conversion Cycle

Another measurement of company's working capital use efficiency is the cash conversion cycle. It is defined as a number of days needed by a company for revenue generation from its assets. It is also often referred as net operating cycle and can be calculated with use of the following formula:

$$\text{Cash Conversion Cycle} = \text{Inventory Conversion Period} + \text{Receivables Conversion Period} - \text{Payables Conversion Period}$$

Divided into three stages, the calculation of the cash conversion cycle includes the following:

- measuring the time, needed by a firm to get materials, produce and sell the ready product;
- measuring the time, needed by a firm to collect the cash for goods sold (accounts receivable);
- measuring the time, needed by a firm to pay the debt to its suppliers.

In conclusion it can be noted that activity ratio analysis is being applied for the measurement of the company's working capital usage efficiency. Activity ratios indicate if a firm manages its inventories, cash, receivables and payables and other assets well.

PROFITABILITY RATIO ANALYSIS

Profitability means the ability of a company to earn a profit. Firm's profitability is very important both for stockholders and creditors because revenue in the form of dividends is being derived from profits, as well as profits are one source of funds for covering debts. Profitability ratio analysis is a good way to measure company's performance. Profitability ratios can be divided into two types: margins, indicating the firm's ability to transform money from sales into profits, and returns, showing the ability of a company to measure the efficiency of the firm in generating returns for its shareholders.

Profitability Ratio Calculation and Analysis

Net Profit Margin

Being a key ratio of profitability and one of the most closely followed numbers in finance, net profit margin (generally expressed as a percentage) measures net income generated by 1 dollar of sales. Calculate net profit margin as follows:

$$\text{Net Profit Margin} = \frac{\text{Net Income Before Noncontrolling Interest, Equity Income and Nonrecurring Items}}{\text{Net Sales}}$$

The higher this ratio is, the better company performs in terms of profitability. Net profit margins will vary from firm to firm due to the different causes, such as, for example, competitive forces within an industry, economic conditions and operating characteristics. This ratio may also vary for different industries. An alternative formula for calculating net profit margin is following:

$$\text{Net Profit Margin} = \frac{\text{Net earnings}}{\text{Net sales}}$$

Net profit margin can be used for the comparison of the same industry companies' profitability and to compare a company's profitability to its past performance. Company's net profit margin increase over some period means that it has become more effective at converting revenue into actual profit.

Gross Profit Margin

Another indicator of firm's profitability is gross profit margin measuring the amount of its gross profit per 1 sales dollar. Both numerator and denominator for the computation of this ratio are available in company's P&L statement:

$$\text{Gross Profit Margin} = \frac{\text{Gross Profit}}{\text{Net Sales}}$$

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