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An Introduction to the Financial Statement Analysis

CONTENTS

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.

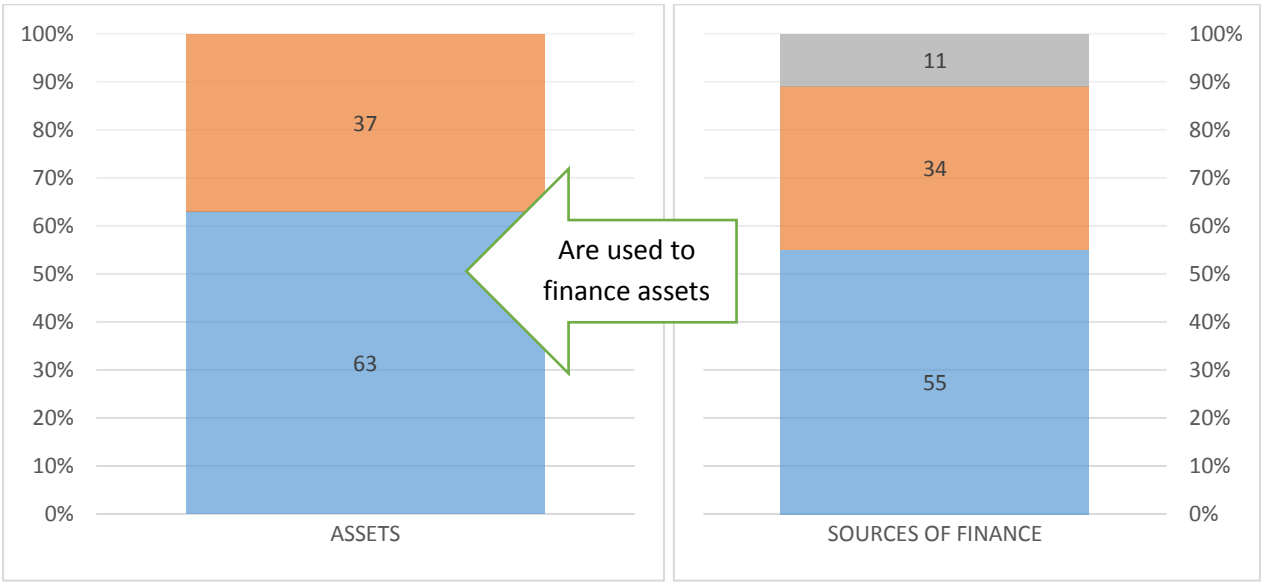

Chart 1. Assets and sources of finance

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:

Assets = 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:

Stockholders' Equity = Total Assets – 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:

Retained Earnings = Beginning Retained Earnings + Net Income – 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:

Total Asset Turnover = Net Sales ÷ 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.

Example 1	TechStandard, Inc.

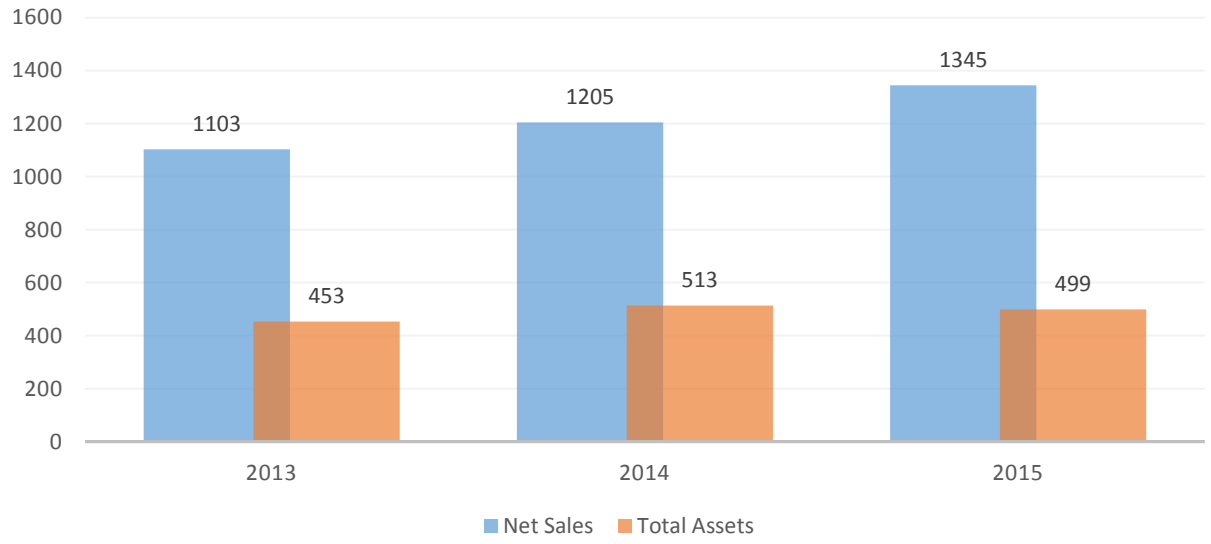

Chart 2. Financial data

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:

Current Asset Turnover = Net Sales ÷ 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:

Sales to Working Capital = Sales ÷ 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:

Accounts Receivable Turnover (Times) = Net Sales ÷ 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:

Accounts Receivable Turnover (Days) = Average Gross Receivables ÷ (Net Sales ÷ 360)

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

Average Collection Period (Accounts Receivable Turnover in Days) = 360 ÷ 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:

Accounts Payable Turnover (Times) = Cost of Goods Sold ÷ 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:

Accounts Payable Turnover = Purchases ÷ 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:

Days Payable Outstanding = Accounts Payable ÷ 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:

Inventory Turnover (Days Inventory Outstanding) = Cost of Goods Sold ÷ 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:

Inventory Turnover in Days = Average Inventory ÷ Cost of Goods Sold ÷ 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:

Inventory Turnover in Days = 360 ÷ 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:

Cash Turnover = Sales ÷ 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:

Cash Turnover = Sales ÷ 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:

Operating Cycle = Accounts Receivable Turnover in Days + 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:

Cash Conversion Cycle = Inventory Conversion Period + Receivables Conversion Period - 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:

Net Profit Margin = Net Income Before Noncontrolling Interest, Equity Income and Nonrecurring Items ÷ 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:

Net Profit Margin = Net earnings ÷ 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:

Gross Profit Margin = Gross Profit ÷ Net Sales

The difference between this ratio and the net profit margin is that gross profit margin excludes costs of goods sold from the calculation. Although the ratio may vary between industries, higher ratios are preferable.

Operating Income Margin

The operating income margin is a measure of operating income of an enterprise, generated by 1 dollar of sales. The numerator of this ratio is net sales excluding costs of goods sold and operating expenses (selling and administrative):

Operating Income Margin = (Net Sales – Costs of Goods Sold – Operating Expenses) ÷ Net Sales

Basically, the numerator defines the operating income of the company, so the following formula can also be used:

Operating Income Margin = Operating Income ÷ Net Sales

The higher this ratio is, the better. All the necessary information for the calculation can also be obtained from the income statement of an enterprise.

Return on Assets

Return on assets is a ratio indicating how well company is able to utilize its assets. During the calculation the amount of profit is compared to the amount of assets, used for this profit generation:

Return on Assets = Net Income Before Noncontrolling Interest of Earnings and Nonrecurring Items ÷ Average Total Assets

Obviously, the higher ratios are preferable for a firm. The increasing trend of this ratio would show that the company's asset use for the profit generation is reasonable, and it increases the amount of profit, generated by 1 dollar of its assets value.

Return on Operating Assets

This ratio includes only operating income and operating assets to the computation in order to focus on only revenue generating kind of assets. It can be calculated by the following formula:

Return on Operating Assets = Operating Income ÷ Average Operating Assets

Operating assets exclude those kinds of assets that aren't in direct use for the generation of revenue. The computation formula for the operation assets is as follows:

Operating Assets = Total Assets - Construction in Progress – Identifiable Intangible Assets - Net - Goodwill - Deferred Income Taxes and Other Assets

The return on operating assets ratio may be used as an indicator of a firm's effort of minimizing the assets, which are not taking part in the revenue generation process.

Return on Investment

An important thing is to understand, how efficiently investments are used in terms of earning income. Return on investment (ROI) is a ratio that measures the income earned on investments and can be computed as follows:

Return on Investment = Net Income before Noncontrolling Interest and Nonrecurring Items + Interest Expense ÷ Average (Long-Term Liabilities + Equity)

This ratio is an important evaluating factor of company's performance, since it reflects the ability of a business to provide the reward for its investors. High return on investment ratio also makes a firm attractive for potential investors, who might be interested in providing it long-term funds.

Return on Equity

Another part of the profitability ratio analysis is return on equity ratio calculation, which measures the ability of a company to generate profits from the stockholders' investments. The calculation formula for this ratio is as follows:

Return on Equity (ROE) = Net Income Before Noncontrolling Interest and Nonrecurring Items ÷ Total Equity

Having calculated the return on equity ratio one can see how much profit is generated by 1 dollar of shareholders' equity. In other words, this is a measurement of how effectively money from stockholders is being used for the profits generation. Considering this, the value of the return on equity ratio is desirable to be high, because that would mean efficient usage of investors' funds. One more formula for this ratio calculation is net profit after taxes being divided by the amount of stockholders' equity:

Return on Equity (ROE) = Net Profit After Taxes ÷ Equity

DuPont Return on Assets

DuPont analysis, named so after the DuPont Corporation, which was the first to use this formula in the 1920s, is the return on equity calculation broken into three parts. This was done to show that the return on assets depends on asset turnover and profit margin. Calculate DuPont return on assets as follows:

Net Income Before Noncontrolling Interest and Nonrecurring Items ÷ Average Total Assets = Net Income Before Noncontrolling Interest and Nonrecurring Items ÷ Net Sales × Net Sales ÷ Average Total Assets

Using this formula we can calculate firm's return on assets for different periods of time. And if we see the decrease of this ratio, the conclusion can be made on the net profit margin and total asset turnover influence on it. Another more general formula for the DuPont return on assets calculation is following:

Return on Assets (ROA) = Net Income ÷ Sales × Sales ÷ Total Assets

DuPont analysis also includes calculation of return on equity ratio through return on assets ratio and financial leverage (also known as equity multiplier). See the following formula:

Return on Equity (ROE) = Net Income ÷ Total Assets × Total Assets ÷ Equity

Net income divided by total assets is the definition of return on assets, while total assets divided by equity is the financial leverage. From this formula we can see how closely related are two of the most important measures of the shareholders' funds usage efficiency.

Example 2 | TechStandard, Inc.

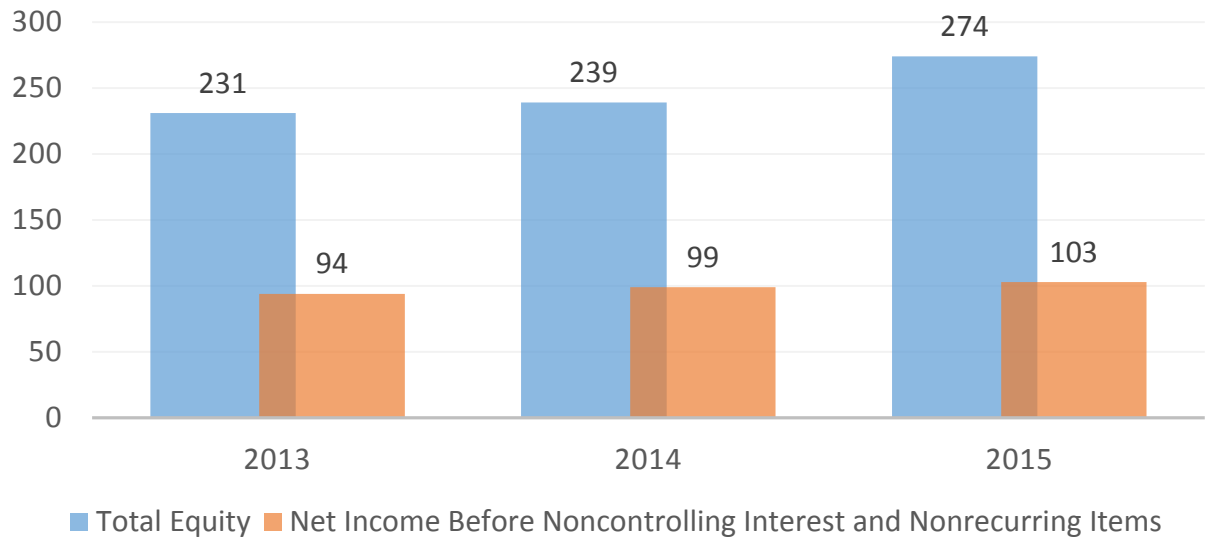

Chart 3. Financial data

The return on equity for 2015 equals $^{103}/_{((274+239)*0,5)} * 100\% = 40,16\%$.

As for the year 2014 this ratio equals $^{99}/_{((239+231)*0,5)} * 100\% = 42,13\%$.

Every dollar of shareholders' equity brought 40,16 cents of the net income in 2015. A decline in 2015 comparing to 2014 was related to the growth of the total equity.

Summarizing everything, the purpose of the profitability ratio analysis is providing the information about the ability of business to generate profit. Firm's profitability is the biggest

concern for both its owners and investors, and it can be measured by calculated two groups of ratios: margins and returns. Return on assets and return on equity are two of the most important ratios for measuring the efficiency of usage of the stockholders' costs. A complex of these ratios calculations is also known as DuPont analysis.

LIQUIDITY OF SHORT-TERM ASETS AND LIQUIDITY RATIO ANALYSIS

Since the short-term debt-paying ability is a very important indicator of the enterprise stability, the liquidity ratio analysis becomes a useful method of analyzing firm's performance. The ability to pay current obligations means there is a higher chance company can also maintain a long-term debt-paying ability and not find itself bankrupt because of not being able to meet its obligations to short-term creditors. Having systematic troubles meeting its short-term obligations means a higher risk of firm's bankruptcy, thus calculating the liquidity ratios and analyzing the results is highly important both for company owners and for potential investors.

Liquidity Ratio Calculation and Analysis

Current Ratio

The formula for the current ratio is as follows:

Current Ratio = Current Assets ÷ Current Liabilities

The current ratio indicates a firm's ability to pay its current liabilities from its current assets. This is the basic indicator of the company's liquidity. Higher numbers are better, meaning that the current assets amount of a firm is higher comparing to current liabilities and thus company has the ability to easily pay off its short-term debt. Generally the normal value for this ratio is 2 or more. However, the comparison with other similar companies should necessarily be made, because for some industries values below 2 are adequate.

Example 3	TechStandard, Inc.

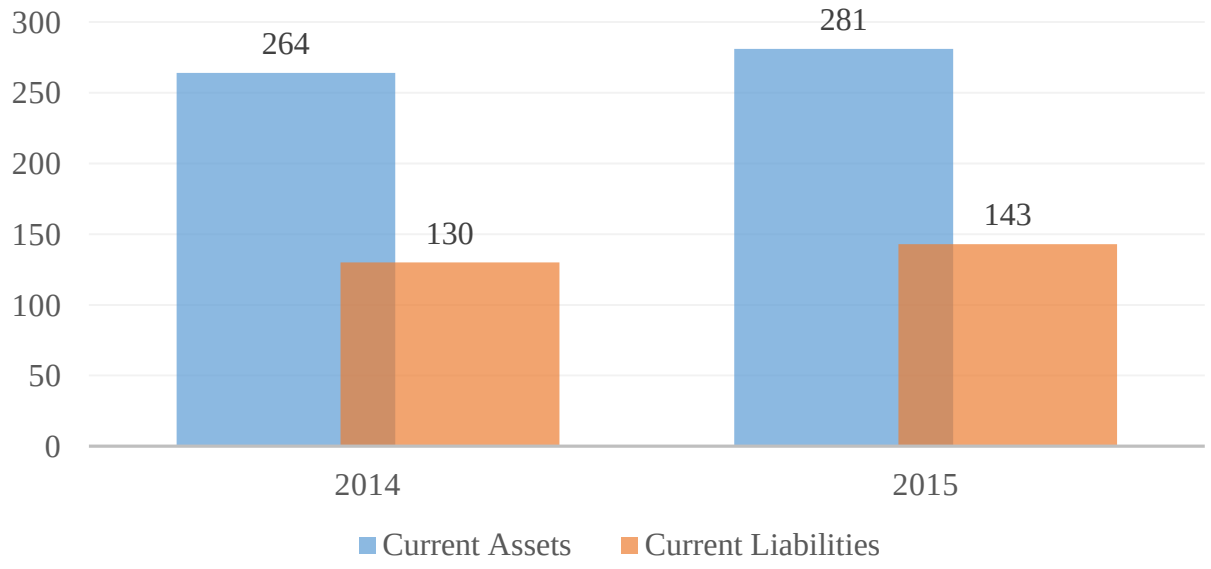

Chart 4. Financial data

The current ratio for 2015 equals $^{281}/_{143} = 1{,}97$.

As for the year 2014 this ratio equals $^{264}/_{130} = 2{,}03$.

The data shows that the company is able to meet its current obligations. For every dollar of current liabilities there is a dollar of current assets.

Quick Ratio (Acid Test Ratio)

The purpose of calculating the quick ratio (also referred as acid test ratio) is to measure how well a company can meet its short-term obligations with its most liquid assets:

Quick Ratio = (Cash Equivalents + Marketable Securities + Net Receivables) ÷ Current Liabilities

This formula can be used for the most conservative ratio calculation, when one needs to exclude items that don't represent current cash flow from current assets. The normal value for this ratio is 1, but as with current ratio, the comparison with similar companies should be made, because in some industries firms with the quick ratio below 1 still have normal liquidity.

A common alternative formula for acid test ratio is:

Quick Ratio = (Cash + Marketable Securities + Accounts and Notes Receivable) ÷ Current Liabilities

This formula provides you with an indication of the business liquidity by comparing the amount of cash, marketable securities and accounts and notes receivable to current liabilities. Should also be mentioned, that the quick ratio does not include inventory and prepaid expenses in the calculation, which is the main difference between the current ratio and the quick ratio.

Finally, another formula for calculating quick ratio exists, which is more general:

Quick Ratio = (Current assets - Inventory) ÷ Current Liabilities

The quick ratio allows to focus on quick assets (those that could be quickly converted to cash), that's why it keeps inventories out of equation. Once again, the normal value for this ratio is 1 or more, meaning that for every dollar of company's current liabilities the firm has at least 1 dollar of very liquid assets to cover those immediately, if needed.

Cash Ratio

A way of company's cash and equivalents amount estimation in terms of liquidity is the calculation of the cash ratio. That can be done using the following formula:

Cash Ratio = (Cash Equivalents + Marketable Securities) ÷ Current Liabilities

The cash ratio is the most conservative indicator of firm's liquidity, indicating its immediate liquidity. Having calculated the cash ratio one can see how well a company can pay off its current liabilities with only cash and cash equivalents. However, it is not realistic to expect the company to have enough cash and equivalents to cover all the current liabilities, because if this occurs, it means that the company's usage of cash is not efficient as cash should rather be put to work in the operations of the firm. Considering this, the detailed knowledge of the business is required to have a chance to draw a conclusion based on the cash ratio calculation. Most commonly, big values of cash ratio would mean inappropriate usage of cash by the company, while cash ratio lesser than 0.2 would mean that the firm might face an immediate problem with paying bills.

Working Capital

Company's working capital indicates its short-run solvency and financial sustainability. The calculation formula for the working capital as follows:

Working Capital = Current Assets - Current Liabilities

The working capital amount is a value that should be compared with past periods of time within the same company to determine its reasonability, while comparing the working capital amount of different companies is pointless due to the different sizes of firms. Current assets are assets that are expected to be turned into cash by a company within one year, or one business cycle. Analogically, current liabilities are liabilities that are expected to be paid by a firm within a year, or one business cycle. Financially sustainable business would be able to pay its current liabilities with its current assets.

Sales to Working Capital (Working Capital Turnover)

A part of liquidity ratio analysis is the calculation of sales to working capital (also referred as working capital turnover). The formula for doing that is as follows:

Sales to Working Capital = Sales ÷ Average Working Capital

The sales to working capital ratio indicates how much cash is needed to generate a certain level of sales. In other words, it measures dollars of sales generated by a dollar of working capital investment. That's why a low working capital turnover ratio most likely indicates that the use of the working capital is unprofitable. This means that sales are not

adequate in relation to the working capital. As with many other ratios, before drawing a conclusion based on sales to working capital ratio, one should make a comparison with other similar companies, industry averages, to compare the dynamics of this ratio comparing to the past periods. Seeing the increase of sales to working capital in dynamics over some period would witness the overall increase of liquidity of the firm.

LONG-TERM DEBT-PAYING ABILITY AND DEBT RATIO ANALYSIS

For a firm being financially sustainable means being able to carry its debt. Usually, the debt ratio analysis is being applied to a company by potential creditors to see, how creditworthy it is and analyze its willingness and ability to pay the debt. Generally, greater amount of company's debt means greater financial risk of its bankruptcy. Long-term debt paying ability of a firm can be viewed as indicated by the income statement and by the balance sheet.

Debt Ratio Calculation and Analysis

Times Interest Earned

The indicator of the firm's long-term debt paying ability from the income statement view is the times interest earned ratio. Having normal times interest earned ratio means lesser risk for a firm not to meet its interest obligation. If this ratio is being relatively high and stable over the years, a company is financially sustainable, while relatively low and fluctuating ratio would mean potential problems with paying the long-term obligations.

Times Interest Earned = Recurring Earnings, Excluding Interest Expense, Tax Expense, Equity Earnings, and Noncontrolling Interest ÷ Interest Expense, Including Capitalized Interest

As seen from the formula, times interest earned ratio measures the amount of income that can be used to cover interest expenses in the future. In opposition to percentage this ratio is expressed in numbers, and it measures how many times a firm could cover the interest expense with its income, so larger ratios are considered more desirable than smaller ones. Another formula for times interest earned calculation is as follows:

Times Interest Earned = EBIT ÷ Interest Expense

Earnings Before Interest and Taxes (EBIT) is also referred as operating profit and it measures firm's profit that excludes interest and income tax expenses. Considering this, times interest earned ratio can also be calculated as follows:

Times Interest Earned = Operating profit ÷ Interest expense

Debt Ratio

The debt ratio is an indicator of firm's long-term debt-paying ability. It is a ratio of firm's total liabilities to its total assets. Use the following formula to calculate the debt ratio:

Debt Ratio = (Total Liabilities ÷ Total Assets) = (Total Assets - Total Equity) ÷ Total Assets

The debt ratio shows how well creditors are protected in case of company's insolvency by indicating the percentage of firm's assets financed by creditors. Issuing the additional long-term debt is inappropriate for a company if its already existing creditors are not well protected. In terms of financial sustainability of a business lower ratios are more favorable. Another ratio that allows to measure firm's long-term debt paying ability is long-term debt ratio:

Long-Term Debt Ratio = Long-Term Debt ÷ Total Assets

As seen from the formula, this ratio measures the percentage of a company's total assets financed with long-term debt, including loans and financial obligations that last more than one year. This ratio comparison made for different periods of time would show whether a company is becoming more or less dependent on debt to run a business.

The Long-Term Debt to Total Capitalization Ratio

The long-term debt to total capitalization ratio is a ratio showing the financial leverage of a firm by dividing the long-term debt by the amount of capital available:

The Long-Term Debt to Total Capitalization Ratio = Long-Term Debt ÷ (Long-Term Debt + Preferred Equity + Common Equity)

This ratio is fully comparable between different companies. That's why it is useful for investors, who can measure their risks with different firms by comparing their long-term debt to total capitalization ratios and identifying the amount of financial leverage, utilized by these firms. The decrease of the long-term debt to total capitalization ratio over time would indicate the lessening long-term debt load of the company as compared to the total capitalization, leaving a larger percentage of the total capitalization to the total stockholder's equity, and vice versa.

Debt to Equity Ratio

Another ratio helping the creditors understand how well they are protected in case of firm's insolvency is the debt to equity ratio. It's a ratio that compares the total debt with the total shareholders' equity:

Debt to Equity Ratio = Total Liabilities ÷ Shareholders' Equity

If a company's debt to equity ratio is high, it has been financing its growth with debt. This is being done to generate more earnings than it would have been without this outside financing. In terms of long-term debt-paying ability the lower this ratio is, the better. Normal values for the debt to equity ratio are different for different industries. Close to this indicator is long-term debt to equity, comparing only long-term debt with the stockholders' equity:

Long-Term Debt to Equity = The Long-Term Debt ÷ (Preferred Equity + Common Equity)

The higher the long-term debt to equity ratio is, the greater a company's leverage is. Most commonly higher long-term debt to equity ratio of a firm would mean more risk for the investor.

Example 4	TechStandard, Inc.

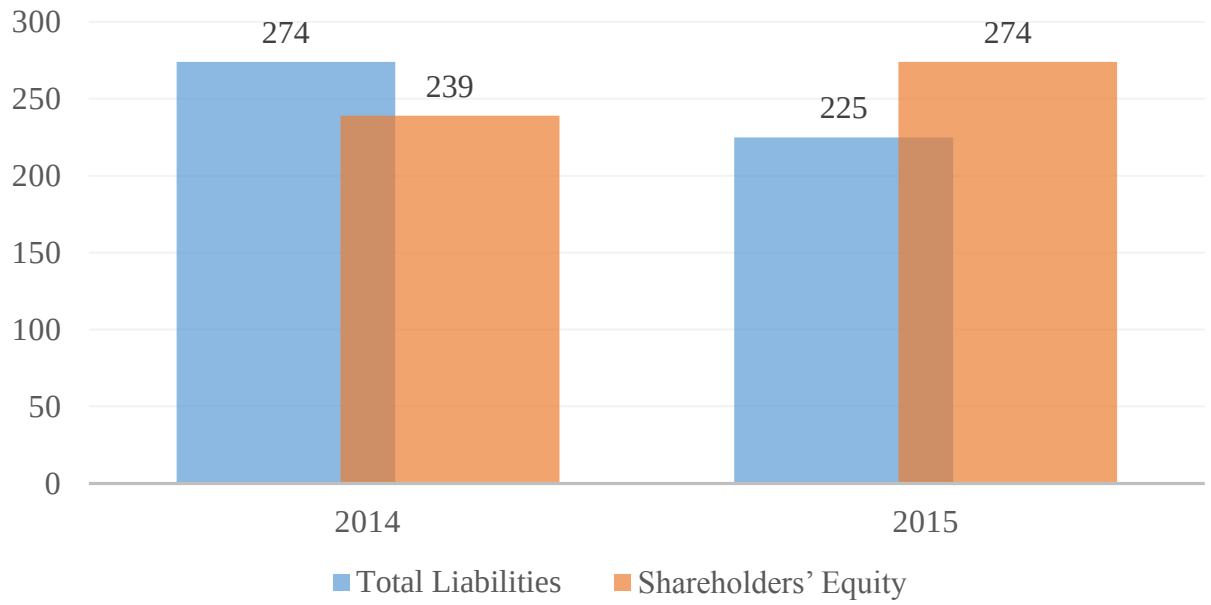

Chart 5. Financial data

The debt to equity ratio for 2015 equals $^{225}/_{274} = 0{,}82$.

As for the year 2014 this ratio equals $^{274}/_{239} = 1{,}15$.

Current Debt to Equity Ratio shows that creditors are protected in case of firm's insolvency. For every 82 cents of creditors' money there is one dollar of shareholders' equity.

Debt to Tangible Net Worth Ratio

More conservative measure for a firm's long-term debt-paying ability is the debt to tangible net worth ratio. It indicates creditors' protection level in case of firm's insolvency by comparing its total liabilities with shareholders' equity excluding intangible assets, such as trademarks, patents, copyrights, etc.:

Debt to Tangible Net Worth Ratio = Total Liabilities ÷ (Shareholders' Equity - Intangible Assets)

Debt to tangible net worth ratio is a measure of the physical worth of a firm, not including any value derived from intangible assets. As with the debt ratio and the debt to equity ratio, from the perspective of long-term debt-paying ability having lower ratio is preferable for a firm.

Overall, applying the debt ratio analysis to the company's financial statement is a good way for an investor to estimate firm's performance and measure the risk. Calculation of debt ratios would clarify the ability of a firm to carry its debt in the long run.

DUPONT ANALYSIS AS A METHOD OF MEASURING COMPANY'S PROFITABILITY

The ability of an enterprise to earn the profit is called profitability, and this is the main objective of the business. Company's profitability measurement is an object of interest of its creditors, investors, managers. The most usual tool of this measurement is the profitability ratio analysis, performance of which means numerous business ratios calculation and interpretation in order to make conclusions on firm's profit generation ability. DuPont analysis is an element of the profitability ratio analysis, which is often being applied to firm's financial statement in order to measure its profitability through a few key ratios: return on assets, return on equity, net profit margin, total asset turnover and financial leverage.

Principles and interpretation of DuPont analysis

Return on assets, net profit margin and total assets turnover are among the most commonly used ratios in the firm's earning ability estimation process. Separately these ratios measure firm's profitability and activity from different views. The DuPont company was the first to break the calculation of the return on assets ratio in two separate parts: calculation of the net profit margin and the total asset turnover. Doing this they developed their own formula, which demonstrated the correlation between these three ratios. This formula looks as follows:

Net Income Before Noncontrolling Interest and Nonrecurring Items ÷ Average Total Assets = Net Income Before Noncontrolling Interest and Nonrecurring Items ÷ Net Sales × Net Sales ÷ Average Total Assets

The main goal of such decomposition is to reveal the basic factors of efficiency. For example, slow asset turnover may witness the influence of firm's bad asset management on the total return on assets, and thus notify the company's management to make some decisions on improvement. In other words, DuPont return on assets can be described with the following formula:

Return on Assets (ROA) = Net Income ÷ Sales × Sales ÷ Total Assets

As mentioned before, DuPont interpretation is also available for the return on equity formula, and it looks as follows:

Return on Equity (ROE) = Net Income ÷ Sales × Sales ÷ Total Equity

Same as with DuPont return on assets, this formula shows the processes that influence firm's return on equity, and the efficiency of use of funds, invested in a firm by its owners. Another way to calculate DuPont return on equity is as follows:

Return on Equity (ROE) = Net Profit Margin × Total Asset Turnover × Equity Multiplier

In a situation, when two companies have the same return on equity ratio, investors should use the DuPont approach and deconstruct the calculation to details. Having higher net profit margin and better asset turnover is preferable, even if the equity multiplier is lower, because this would indicate good management level of a company, and the capital structure is easily changeable.

More detailed formula for the DuPont return on equity calculation looks as follows:

Return on Equity (ROE) = Net Income ÷ Sales × Sales ÷ Assets × Assets ÷ Equity

Take a look at the following example to understand the reasons of splitting the calculation of the return on assets into parts:

	Return on Assets =	Net Profit Margin x	Total Asset Turnover
Company A			
Year 1	5% =	2% x	2,5
Year 2	4% =	2% x	2,0
Company B			
Year 1	5% =	2% x	2,5
Year 2	4% =	1,6% x	2,5

Table 2. DuPont profitability analysis on the example of two companies

This table shows the information about two companies with a similar declining trend of return on assets. It declined from 5% in year 1 to 4% in year 2 for both of them. However, key reasons of the decline were different. Company A slowed down the turnover of its assets, and Company B reduced its net profit margin. Both processes have led to the same result.

Considering everything mentioned, we can assume that DuPont analysis is a form of calculation of common business ratios, where profitability ratios, such as return on equity and return on assets are being interpreted through other ratios. This is being done to estimate the reasons of changes in profitability, measure the effect of company's management on it and make appropriate business decisions.

FORECASTING FINANCIAL DISTRESS WITH ALTMAN Z-SCORE MODEL

Named after its inventor Edward I. Altman, the Z-score model for predicting bankruptcy (also referred as a model for financial distress prediction, or simply bankruptcy test) is a special model, applying which the analyst would be able to predict firm's bankruptcy within a period of two years. It is often used for company's default possibility measurement and for estimating its financial distress status.

Z-score Formula Estimation

The elements of the Altman Z-score formula computation are five business ratios, which are commonly used during the financial statement analysis performance. They are being marked as X1, X2, X3, X4 and X5. Z-score is a result of these ratios being weighted by coefficients and summed up. The coefficients were developed after application of the analysis to some firms, which have declared becoming bankrupts.

The formula for Z-score computation looks as follows:

$$Z = 1{,}2X1 + 1{,}4X2 + 3{,}3X3 + 0{,}6X4 + 0{,}1X5$$

Let's have a closer look at its components:

X1 = Working Capital ÷ Total Assets. The working capital to total assets is a ratio, which is usually being computed as a part of the firm's liquidity ratio analysis. The ratio should only be compared between similar-sized companies, working in the same industry. There is no recommended value for this ratio, however, negative working capital to total assets ratio would indicate problems with paying short-term debts.

X2 = Retained Earnings ÷ Total Assets. This is the ratio of two elements of the balance sheet of a firm, indicating firm's profitability and leverage. It measures the part of assets, which has been financed by the retention of earnings instead of short-term and long-term debts.

X3 = Earnings Before Interest and Taxes ÷ Total Assets. Also referred as return on total assets, this is a key ratio in Altman formula, and it reflects the efficiency of company's assets usage in order to generate earnings before paying the contract obligations and taxes.

X4 = Market Value of Equity ÷ Book Value of Total Debt. This ratio measures the possible decline in value of firm's assets before its insolvency in case the liabilities exceed assets.

X5 = Sales ÷ Total Assets. This is a commonly used ratio during the activity analysis of a firm, called total asset turnover. It measures the ability of a firm to generate sales through its assets.

Z-score is a value, received after summing up all the variables from the equation.

Understanding the Results of Z-Score Analysis

Having computed the Z-score for a firm, the analyst can make a conclusion on its bankruptcy risks, based on the value calculated. There are special zones for Z-score values, depending on which the financial distress risk may either be high, or low:

- Z-score higher than 2.99 is considered to be in a safe zone;

- Z-score between 1.81 and 2.99 is considered to be in a gray zone;

- Z-score lower than 1.81 is considered to be in a distress zone.

All things considered, Altman Z-score financial distress prediction model is a useful tool for company's financial health estimation. Based on common financial ratios this formula is a fast way to predict either the possible bankruptcy of a firm, or to confirm its stable financial position.

FINANCIAL RATING ANALYSIS

Very often different users of the financial analysis of a company, such as creditors, investors, firm's managers, regulatory organizations, are in need of getting a brief and clear summary of its financial condition. With numerous ratios calculation we can only get the understanding of some specific spheres of company's activity and performance. Considering this we have developed a special rating system for the company's financial condition estimation exclusively for finstanon.com. Its methodology includes calculation of the firm's most important indicators, and depending on their values, definition of the summary financial rating of a company.

Financial Rating Estimation

The process of estimating the financial rating of a company includes calculation of ten important business ratios, also commonly used during the financial statement analysis performance. These indicators are:

1. *Net Profit Margin.* Key ratio of the profitability analysis of a firm, measuring the amount of net income, generated by 1 dollar of sales. Information, necessary for the calculation can be obtained from the profit and loss statement of a company.

2. *Return on Assets.* Ratio, measuring the efficiency of the company's resources utilization process, comparing the amount of profit to total assets. Also a part of the profitability ratio analysis.

3.*Debt to Equity Ratio.* Being a part of the debt ratio analysis, this ratio indicates the level of protection of company's creditors in case firm becomes insolvent. In other words, it indicates if the company has been financing its growth through increasing its debt.

4. *Current Ratio.* Being a part of the liquidity ratio analysis, this ratio measures the ability of a firm to pay its liabilities from its assets. Information for the calculation can be found in firm's balance sheet.

5. *Net Sales Change.* A change in company's net sales expressed as an absolute value.

6. *Operating Income Margin.* A part of the profitability ratio analysis measuring the operating income, generated by 1 dollar of sales.

7. *Equity Change.* An absolute value expression of a change in company's equity.

8. *Quick Ratio.* Also referred as acid test ratio, it measures how well a company can meet its short-term obligations with its most liquid assets. An important part of the liquidity ratio analysis.

9. *Debt Ratio.* A ratio that indicates firm's long-term debt-paying ability by comparing its total liabilities to total assets. It measures the protection level of company's creditors in case of its insolvency.

10. *Times Interest Earned.* A ratio that measures the amount of income, available for covering interest expenses in the future.

After all of these ratios calculations, they are being compared to the normative values. Depending on this comparison results, each of the ratios gets 1, 0 or -1 estimation. They are being weighted by coefficients, carefully selected for each ratio according to its importance and influence, and summed up. The final result of the calculation is the financial rating of a company. The final conclusion on company's financial condition is being made depending on the value of this financial rating, and the estimation grade is as follows:

Score from (inclusive)	to	Sign	Current financial condition
1	0,8	AAA	Excellent
0,8	0,6	AA	Very Good
0,6	0,4	A	Good
0,4	0,2	BBB	Positive
0,2	0	BB	Normal
0	-0,2	B	Satisfactory
-0,2	-0,4	CCC	Unsatisfactory
-0,4	-0,6	CC	Adverse
-0,6	-0,8	C	Bad
-0,8	-1	D	Critical

Table 3. Estimation grade for the financial condition of the company according to finstanon.com

The financial rating system is useful for all users of financial analysis, who are in need of brief and clear estimation of firm's financial condition. Based on the most common and important business ratios, the calculation of the financial rating of a company is a process, giving us an opportunity to confirm good or bad financial condition of a firm by computing a weighted score and analyzing it.

APPENDIX

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e-GO! Library

AS SEEN ON TV

THE BEST BOOKS IN YOUR POCKET!

Jam-pack your Kindle, iPad, Android, Nook, or any device, full of amazing books with your own e-GO! Library. At your leisure pick your favorite titles from a wide array of categories for all tastes. Total speed, convenience & mobility are yours. Your e-GO! Library is an innovative way “to have & hold” a fresh and plentiful supply of great titles. It’s seemingly endless entertainment without the need for the internet or downloading! All in a preloaded, USB memory flash drive which puts a thousand of today's best books in your pocket!

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- ✓ **PERFECT** for Travel
- ✓ **FUN** for the Whole Family
- ✓ **MAKES** a Great Gift

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