

Tableau Task Guideline (CS Only)

The data analytics which you will complete using the Tableau software with fundamental knowledge of company financial statement analysis. The purpose of financial statements is to provide financial information to decision makers, including our CS investors. Investors can use the information contained in financial statements to better understand company performance so they can make better investment decisions.

I will introduce you the DuPont Method (often known as DuPont Analysis, DuPont Model) for this work.

For this case, please ensure you have the following (1) first understand and leverage the ratios involved in the DuPont Method and (2) use the DuPont Method to perform data analytics and data visualization analysis.

For this work package, please implement an analytics model by comparing our target client companies within given sectors using the accounting ratios from the DuPont method. **Your work is very important for us to develop an investment portfolio for our Investment Banking Division capital market investor.**

Before you start, you will need to form an understanding of a few financial ratios, which will help you to develop the right questions about the companies you are analyzing. In Part 2 you will load the data into Tableau, perform tests to verify that you have loaded it correctly, analyze the data, finally, you will develop a recommendation for investor, and finally, leverage the power of data visualization to present the data so that it can be easily interpreted and understood by your investor.

TableauProject

Part 1 Understand Ratios

What is DuPont Analysis

DuPont start from a company called E. I. du Pont de Nemours and Company, and it is the oldest stock in the current Dow Jones Industrial Index. Started in July 1802, the company originally focused on producing gunpowder. Present, this company makes chemicals from food ingredients, dietary supplements to pharmaceuticals and fabrics.

In addition to developing chemicals, the company has been a pioneer with respect to management financial accounting systems. The company developed the original accounting ratio of **return on equity** (ROE) and then in 1912, Donaldson Brown decomposed ROE into additional ratios. **ROE measures a company's profitability as a percentage of shareholder's equity (i.e., how profitable a company can be using shareholders' investments.)** If ROE is unsatisfactory, the DuPont analysis can identify the aspect of the business that is underperforming.

DuPont used this formula for managing its business. In 1914 DuPont invested in General Motors (GM), and using the same basic management accounting formulas, led that company to become the world's largest automobile company. In 1957, DuPont divested its ownership in General Motors because of antitrust laws. After having been highly useful for both General Motors and DuPont, the basic DuPont Method has been extended and used by many to understand investing and managing businesses.

The DuPont Method has evolved into the following formula:

Return on Equity = Profit margin ratio * asset turnover ratio * financial leverage ratio

This can be written as follows:

$$\frac{\text{Net Income}}{\text{Shareholders' Equity}} = \frac{\text{Net Income}}{\text{Sales}} * \frac{\text{Sales}}{\text{Total Assets}} * \frac{\text{Total Assets}}{\text{Shareholders' Equity}}$$

Financial Ratios often used in CS IBD team

Return on equity: This represents the amount of net income that is generated for each dollar of shareholder's equity. It can be interpreted as the amount of net income generated for each dollar of value that a shareholder owns of the company. This number can be either negative or positive.

Profit margin ratio: This represents the amount of net income that is generated for each dollar of sales. It can be interpreted as the percentage of each dollar of sales that the company retains as earnings. Since net income can be negative, this ratio can be either negative or positive.

Asset turnover ratio: This represents the amount of sales that is generated for each dollar of assets the company owns. This is often interpreted as the efficiency of the company—how many sales it can generate given the assets it owns. Except in very unusual circumstances, this ratio is positive.

Financial leverage ratio: This represents the amount of assets that is financed by shareholders, as opposed to debt holders. Except in very unusual circumstances, this ratio is positive.

Data

You are first required to download the financial statement data for approximately 10 companies for each of six different sector groups (total sample size of almost 60 companies) for fiscal years 2015-2018. Please note, these companies are all publicly traded on the NASDAQ stock exchange.

Below is some key item you should understand from financial statement.

- ▶ Industry: One of six industry groupings as defined by Nasdaq.com.¹ Industries included in the sample are capital goods, consumer services, finance, public utilities, technology, and transportation.
- ▶ Name: The name of the company for each line of data.
- ▶ Net income: The bottom line number on the income statement. This is the final net income number of the company for the fiscal year.
- ▶ Total Sales: The top line number on the income statement. This represents total revenues (less a few items that you can ignore for this case) earned by the company in the fiscal year.
- ▶ Ticker: The code used to identify each company on the NASDAQ stock exchange. Each company has their own unique ticker symbol.
- ▶ Total assets: The total assets of a company at the end of the fiscal year. This number appears on the balance sheet.
- ▶ Total shareholder equity: The total shareholder equity of a company at the end of the fiscal year. This number appears on the balance sheet and also can be called stockholder's equity.
- ▶ Year: The fiscal year being reported on the financial statements. For example, a year of 2015, means the balance sheet of the company is as of the last day of their fiscal year in 2015.

¹ See <http://www.nasdaq.com/screening/companies-by-industry.aspx> for industry groupings.

Tableau Case Implementing the DuPont Method Part 2 - Creating and Reporting Analytics

Extract, transform and load the data (the ETL process)

Please extract all the company that I requested-and download financial statement from company site or from credible sources and loaded into the Excel file. And import the data loaded into Tableau.

Step 1 – Load the Source Data

Create a folder for your Tableau work on your computer or USB drive.

Import the data into Tableau. (Please note: when loading the data into Tableau, you need data from both the **income statement** and the **balance sheet** tabs. Make sure that you link the income and balance sheet data correctly by matching the data on both ticker symbol and year.)

Name your Tableau file Tableau<last name><first name> Save it in the Tableau folder you created.

Once you upload the data into tableau, please provide a quick summary for the following question. (Word Doc)

1. What are the combined total assets of all companies for all years?
2. How many different companies are listed in the dataset?
3. How many different companies are there in each industry?
4. What are the total sales for each industry in 2017 & 2018 (do not round your answers)?

Apply appropriate data analytic techniques

You will be required to do some transformation to analyze the data (e.g., you will need to compute the ratios involved in the DuPont Method).

Step 2 - Create Calculated Fields

Create calculated fields for the following 4 ratios.

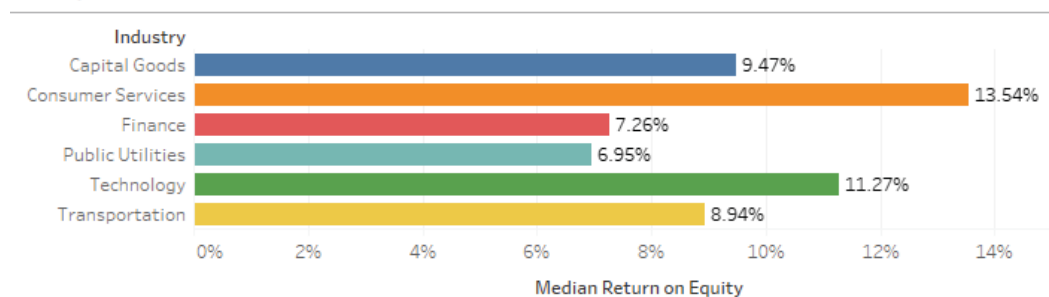
- return on equity,
- profit margin ratio,
- asset turnover ratio,
- financial leverage ratio.

The formulas and field names are explain in the Part I. Background. (No Tableau sheets are created when calculating fields.)

Step 3 - Questions about Industries

Label your Tableau sheets P3-Q1, P3-Q2, etc. Your visualizations should look like the one below:

P3-Q1



1. What is the median return on equity for each industry?
2. What is the median profit margin ratio for each industry?
3. What is the median asset turnover ratio for each industry?
4. What is the median financial leverage ratio for each industry?
5. Create a dashboard using three of the visualizations you just created in questions 1-4 above.

Step 4 - Questions about companies

Please draft a proposal to the investor on which individual company stock to purchase. Please consider the the ratios you calculated when you suggest which company stock.

You need to create at least three additional visualizations to help your investor and label them P4-Q1, P4-Q2, etc. I will suggested some visualizations below, but feel free to create your own. You must use these two visualizations in your report to your investor.

- What companies have the best ROE within each industry for 2018? (Hint: For this analysis, each company needs to be grouped within its industry and ordered by rank so that the highest return on equity appears on the top. A horizontal bar chart works well to display this information.)
- You can create similar analysis as the one above for the other ratios.
- What company had the most sales over the three-year period and what was the total amount of those sales? (Hint: For this analysis, total sales needs to be summed for each company and ordered by rank so that the highest grossing company appears on the top. A horizontal bar chart works well to display this information.)

- Perform a similar analysis as the one above for total profit over the three year period or for just 2015.
- Which companies have a negative median profit margin in 2018 by industry?
- You can create similar analysis as the one for negative profit margin for the other ratios.

Report results of data analytic techniques

Step 5 - Report to Investor

You need to present your findings and give your opinion to your investor on which individual company stock to purchase.

You need to create a Tableau Story containing at least four visualizations (story points) from this work supporting your opinion. Name the tab "Draft Investment Recommendation Version 1.0".

(Please don't stress over the opinion part. I will do a second review before submitting to our investor.)

Step 6 - Submit your Work

Save your Tableau file as a Tableau Package.

File>Save As>

Choose "Tableau Packaged Workbook" from the "Save as Type" drop down menu.

