DuPont Case[[1]](#footnote-1) - Updated

ACCY 575, Spring 2018

# Background and Overview

In this case, you will compare the financial performance of companies in different industries. To facilitate comparisons across industries, you will use return on equity (ROE), a normalized measure of performance. Using the DuPont method, you will decompose ROE into return on operating assets and return from financing activities and use these disaggregated measures in your comparisons.

Much of your analysis will be graphical. You will use the software package Tableau, an increasingly popular tool for data analysis and visualization.

The objectives of this case are:

* Use ROE and related ratios to compare companies of different sizes and industries.
* Learn Tableau.
* Extract, transform and load the data into Tableau.
* Explore the data and extract insights.
* Explain the data and tell a story using visualization.

# Deliverables

This case has an individual portion and a group portion. Each has separate deliverables.

## Individual Deliverables (50% of grade)

1. A Tableau file containing the visualizations you will create for the questions in parts 2 and 3.
2. If you have already done the memo, feel free to submit it alongside your Tableau file. However, I would prefer that you submit a single Tableau file with your individual work. I strongly recommend you use captions in each worksheet or dashboard to annotate your work.

You may consult with other students (and I encourage you to do so). However, your individual deliverable must be your own work.

## Group Deliverables (50% of grade)

1. A memo containing the answers to the questions in parts 4 and 5.
2. A Tableau file containing a “dashboard” for parts 4 and 5.
3. Each group will present their dashboard in class on Feb 13.

# Case Requirements

## Part 1 (Individual): Learn Tableau

This case is designed to help you learn and use Tableau, a common tool for data visualization. Thus, you are required to use Tableau to transform and visualize your data.[[2]](#footnote-2)

If you have never used Tableau, you may wish to read or watch some tutorials. Some potentially helpful resources are listed below. Everybody learns differently, so do not feel compelled to use these resources.

* Official Tableau training videos: <http://www.tableau.com/learn/training>. Of the videos at this site, you may find the following particularly useful:
  + Getting Started: <http://www.tableau.com/learn/tutorials/on-demand/getting-started>
  + Understanding The Tableau Interface: <http://www.tableau.com/learn/tutorials/on-demand/tableau-interface>
  + Getting Started with Data: <http://www.tableau.com/learn/tutorials/on-demand/getting-started-data>
* Official Tableau tutorials: <https://onlinehelp.tableau.com/current/guides/get-started-tutorial/en-us/get-started-tutorial-home.html>
* A website with a Tableau tutorial (no videos): <https://www.tutorialspoint.com/tableau/tableau_get_started.htm>

## Part 2 (Individual): Extract, Transform and Load the Data (The ETL Process)

### Data Description

There is a single Excel file with 2 tabs, *DuPont Data.xlsx*. This Excel file contains financial statement data for approximately 30 companies in six industry groups (total sample size of about 180 companies) for fiscal years 2013 – 2015. All companies are all publicly traded on the NASDAQ stock exchange and range in size from some of the largest to the smallest in their respective industry groupings. You need not use all of the data items. The most useful items are discussed here:

* Name: The name of the company for each line of data.
* Ticker: The code used to identify each company on the NASDAQ stock exchange.Net income
* Industry: One of six industry groupings as defined by Nasdaq.com, including capital goods, consumer services, finance, public utilities, technology, and transportation.
* Year: The fiscal year being reported on the financial statements.
* Net revenue (Sales): Total revenues (less a few items that you can ignore for this case) earned by the company in the fiscal year. This is also referred to as total sales.
* Total assets: The total assets of a company at the end of the fiscal year.
* Total shareholder equity (Stockholder’s Equity): The total shareholder equity of a company at the end of the fiscal year.

### Extraction and Transformation

The data for this case was extracted from company financial statements posted online from credible sources. The extraction of the data from the online sources was performed for you and the data has been loaded into an Excel file. Though Excel can be inefficient and is not useful for large data sets, it is still used by many companies that you will encounter. Thus, you can expect to receive data in this format from clients. You can assume that the web scraper accurately and completely extracted the information and loaded it into Excel. While most of the transformation work has been done for you, you will need to do some additional transformation (e.g., you will need to compute the ratios involved in the DuPont Method).

### Loading the Data

Load the data into Tableau. You will need data from the income statement and balance sheet tabs. Therefore, you must link the income and balance sheet data correctly in Tableau. There will be 516 rows visible if you link the data correctly.

### Part 2 Questions

Please answer the following questions in Tableau. These questions will help you ensure that you loaded the data correctly. You may wish to check your answers in Python.

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 2013?
5. What company had the most sales over the three-year period and what was the total amount of those sales?

## Part 3 (Individual): Apply Appropriate Data Analytic Techniques

You are now ready to analyze the data. For each question below, please do the following:

* Identify the type of the analysis to perform.
* Identify which data elements are needed to perform the analysis.
* Create the analysis using Tableau. Include one tab for each question in your Tableau file.
* Include your answers to these questions in your memo.

### Part 3, Question 1

In fiscal year 2015, determine which industries exhibit the highest and lowest values of the following performance indicators. Alternatively, rank the industries along these performance indicators. To limit the effect of outliers, use the **median** industry performance when computing these values.

* Return on equity
* Profit margin
* Asset turnover
* Financial leverage



Use one or more Tableau graphics to answer these questions.

### Part 3, Question 2

For each industry, compute the median ROE in 2013 and 2015. Which industry exhibited the greatest improvement in ROE? Explain this increase. Why do you think this industry exhibited the highest increase? Use the ratios from the DuPont method to support your argument. Provide a graphic that illustrates your results.

### Part 3, Question 3

Assume you want to invest in one of the industries included in the dataset (i.e., buy stock in all companies in one industry). Which industries do you think will offer the highest and lowest return on equity in 2016? For each industry, plot ROE by year, and superimpose a trend line. Does removing outliers change your opinion?

Provide one or more graphics that support your arguments.

### Part 3, Question 4

In each industry, list the company with the highest ROE in 2015. Provide a graphic that shows all companies in each industry sorted by 2015 ROE. What observations do you make about differences in ROE for the different companies?

### Part 3, Question 5

Companies that have negative profit margins but are increasing their asset turnover ratio are “accelerating into a brick wall” (i.e., they are getting better at losing money). Which three companies in 2015 are the worst? In other words, of all companies with negative profit margin in 2015, list the three with the highest asset turnover.

Provide one or more graphics that illustrate your results.

### Part 3, Question 6

Create a dashboard that allows you to evaluate how a company’s ratios change between 2014 and 2015. The dashboard should show the ratios for 2014 and 2015, the percentage change from one year to the next, and the percentage change for the company’s industry. Choose three different companies and discuss what you learn about the company based on these metrics. The three companies do not have to be in the same industry.

## Part 4 (Group): Planning Your Analyses

Investors and management are important stakeholders of companies. Choose one of these stakeholder groups. You will assume the perspective of that a stakeholder in this part and the next.

Think about the goals, incentives, and motivations of the stakeholder group you chose. Specifically, how are they rewarded and punished? How do they make or lose money? Next, think about ways to use the available data, and the DuPont method, to help them achieve their goals.

### Part 4, Question 1

List five questions to ask the data (see data description below). For each question, discuss possible ways of answering it and why the answer would be important to your stakeholders.

The length of your response to part 4 should be no more than 2 pages.

## Part 5 (Group): Interpret and Share the Results

You have thought about what questions would be relevant, loaded and transformed the data, and answered some interesting questions. Now it is time to tell a story about this data. Create a visual dashboard or graphic that answers one or more of the questions you posed in part 4. When considering your visualization, make sure to think about what type of visualization will provide the clearest and most compelling format for stakeholders to understand what you want to convey. Include this visualization in your Tableau file.

Additionally, provide a concise, written analysis explaining your visualization and its findings in your group memo.

1. This case is adapted from “Analytics mindset case studies – DuPont”, © 2016 Ernst & Young Foundation (US). All Rights Reserved. SCORE No. 02050-161 US [↑](#footnote-ref-1)
2. You must do all your analysis in Tableau. You may check your work in Python, but you may not manipulate or visualize data in Excel. [↑](#footnote-ref-2)