# The DuPont Analysis and its Efficacy across Different Companies and Industries

FE582 - Data Visualization

## Objective

Determine the relevancy and efficacy of the DuPont analysis for gauging company performance. The analysis will compare different companies, industries, and sectors.

## Abstract

Return on equity is one of the key ratios used by companies to measure how well a company uses its investments to generate earnings growth. Return on equity in its simplest form is net income divided by the total equity of the firm. However, many analysts consider this measurement to be an overly simplistic measurement of ROE and have extended the formula to allow analysts to better capture the causes of changes in ROE [1].

On the surface, the higher the return on equity, the better the company is using their investments to generate growth. However, this is not always true and by extending the return on equity formula analysts are able to determine if the higher return on equity is due to positive results from the company or are a red flag.

In the 1920s, the DuPont Corporation created the DuPont analysis for return on equity to provide a closer look into the company's profitability. The DuPont formula breaks out return on equity into the following equation:

$$ROE = \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Shareholder Equity}}$$

Rather than relying on solely (Net Income / Shareholder Equity), the DuPont formula separates the equation into the following:

- Profit Margin (Net Income / Sales)
- Asset Turnover (Sales / Total Assets)
- Equity Multiplier (Total Assets / Shareholder Equity)

Each of these ratios can tell us different things about the company and there will be different expected ratios for different industries. For our proposal, we will actually use the extended DuPont ROE, which will include Tax Burden (Net Income / EBT) and Interest Burden (EBT/EBIT):

$$ROE = \frac{\text{Net Income}}{\text{Average Total Equity}} = \frac{\text{Net Income}}{\text{Pretax Income}} \times \frac{\text{Pretax Income}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Average Total Assets}} \times \frac{\text{Average Total Assets}}{\text{Average Total Equity}}$$

The extended DuPont formula will allow us to determine if companies are increasing their return on equity by adding leverage (increasing debt), by decreasing their tax rate, or by increasing their margins and profitability.

## Research Questions

Some potential research questions include:

1. How does the DuPont formula hold up against companies from different industries and sectors?

2. How can DuPont analysis be incorporated into an investment strategy

3. Are some factors of the DuPont analysis more relevant than others, especially when considering the industry?

## Domain

We currently plan to look at DuPont analysis across nine sectors, and the five different industries in the financial sector:

### Nine Sectors:

- Consumer discretionary: Michael Kors Holdings Ltd

- Consumer staple: Dr Pepper Snapple Group

- Energy: Targa Resources Corp

- Financials: JPMorgan Chase & Co

- Health Care: AAC Holdings Inc

- Industrials: Southwest Airlines Co

- IT: Facebook Inc

- Material: Alon USA Partners LP

- Utilities: Public Service Enterprise Group Inc

## Financial sector across industries:

Banking Industry:
- JPMorgan Chase & Co
- Bank of America Corp

Capital Markets Industry:
- Goldman Sachs Group Inc
- Moody's Corp

Consumer Finance Industry:
- Citigroup Inc
- Banco Santander SA

Insurance Industry:
- Aon PLC
- MetLife Inc

Real Estate Investment Trusts Industry:
- Public Storage
- American Tower Corp

## Data Sources and Technology

There are several data sources that will provide the data needed to conduct our analysis. Resources include financial statements provided by the SEC [2], aggregated financials calculated by the NASDAQ [3], Yahoo Finance [4] and also the financial ratios provided by Wharton's Research [5]. The technology used for the analysis will be a combination of Python and R. Our current plan is to do the data scraping and cleaning in Python then perform the analysis and algorithms in R.

## References:

(1) https://en.wikipedia.org/wiki/DuPont_analysis

(2) https://www.sec.gov/dera/data/financial-statement-data-sets.html

(3) http://www.nasdaq.com/quotes/company-financials.aspx

(4) https://finance.yahoo.com

(5) https://wrds-web.wharton.upenn.edu