Dupont Analysis

Table of Contents

- **Introduction**

DuPont analysis is a useful technique used to decompose the different drivers of ROE (return on equity). There are three major parts the derive ROE: Return on sales (ROS), Asset Turnover ratio (AT), and Financial Leverage (FL).

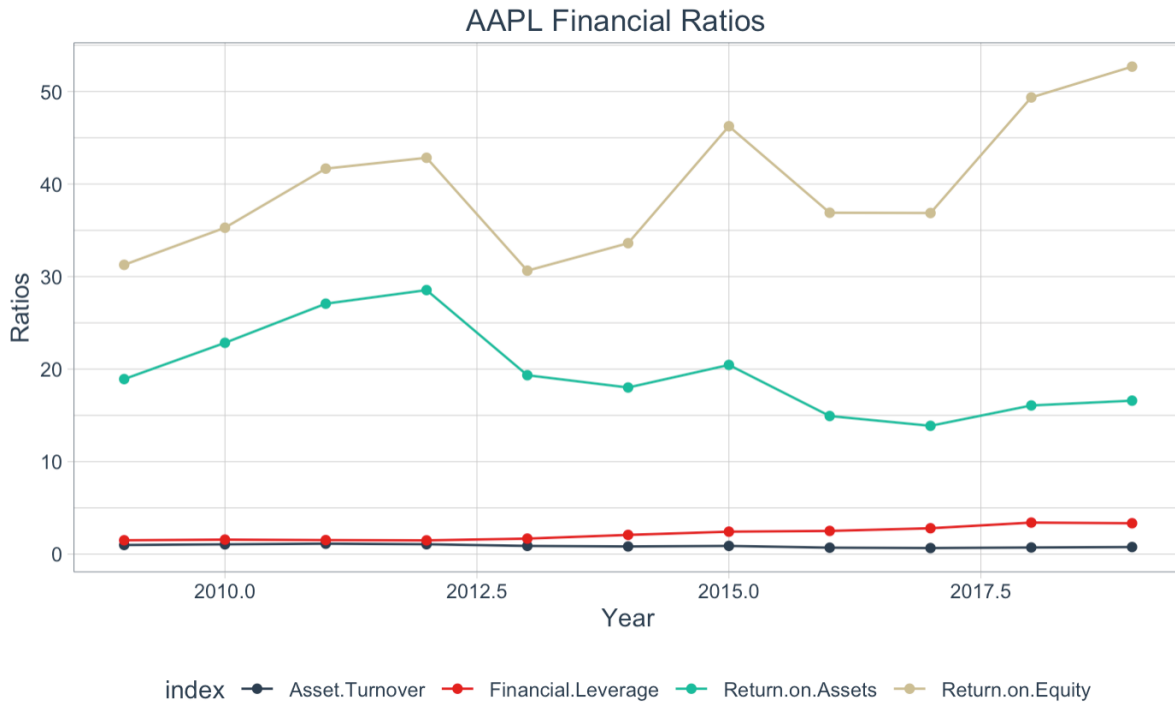**Dupont Analysis = ROS × AT × FL = ROA × FL**

$$ROS = \frac{NetIncome}{Sales(Revenue)}$$

$$AT = \frac{Sales}{TotalAssets}$$

$$FL = \frac{TotalAssets}{TotalEquity}$$

ROE is a measure of how well a company's management creates value for its shareholders. A higher ROE indicates that it's a better company. ROA is the indicator of a company's success, which is composed of ROS and AT. ROS is a ratio used to measure how much profit is making out of each sale where AT is a ratio describes how much product sold out of total assets owned. If a company has both high ROS and AT means that the company has a good efficiency. Leverage is which is the indicator of how many assets on average each equity shares.

- **AAPL Stock Analysis**

AAPL Financial Ratios

index ● Asset.Turnover ● Financial.Leverage ● Return.on.Assets ● Return.on.Equity

As we can see, in the past decade from 2009 to 2019, there were fairly small continuous increasing in Leverage and Asset Turnover nearly didn't change. Since there was no significant change in AT; ROA fell or increased while ROS was fallen or increased. And therefore, ROE fell or increased as ROS and Leverage fell or increased. From the data we have, the ROA of AALP has been increasing from 2009 to 2012 and had a big drop in 2012. Since then, the ROA had been decreasing in general. Therefore, ROS decreased from 2012 to 2019 since there was no change for AT.

ROE & ROS & LV

ratios

Company —●— Financial.Leverage..Average.   —●— Net.Margin   —●— Return.on.Equity..
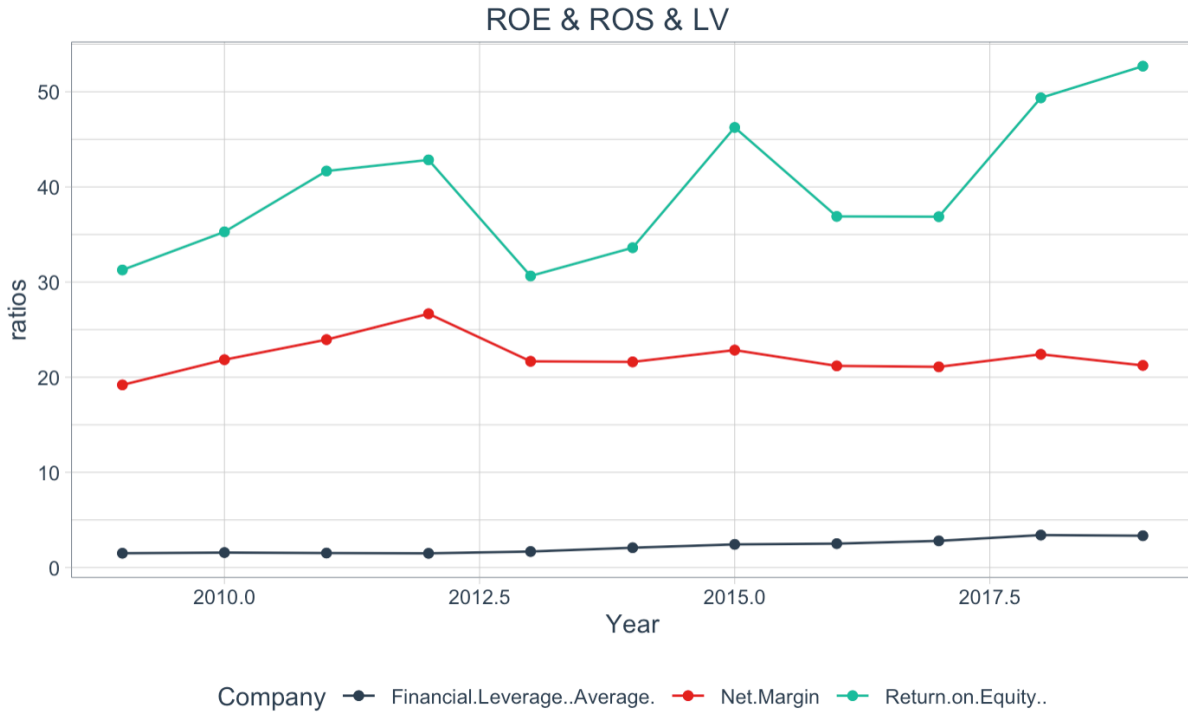
As can be seen from the graph, from 2009 to 2019, there was no significant increase or decrease for net margin (ROS); net margin appeared a stable trend that varies between 26% and 20%. From the ROE graph, we can conclude that the increase in leverage is the main factor for boosting ROE. The increase of one percent of leverage generated a nearly 10% increase of ROE.

- **Selecting Peer Stocks**

Selecting the data of aaple company and figure out which subsector Apple company belongs to.

```r
AAPL <- sp500 %>%
  filter(Symbol == "AAPL")
AAPL
```

Symbol <fctr>	Security <fctr>	SEC.filings <fctr>	GICS.Sector <fctr>	GICS.Sub.Industry <fctr>
AAPL	Apple Inc.	reports	Information Technology	Technology Hardware, Storage & Peripherals

1 row | 1–5 of 9 columns

Figure out which which company belongs to the same sector and sub industry as the Apple company.

```r
AAPL_peer_stocks <- sp500 %>%
  filter(GICS.Sub.Industry == "Technology Hardware, Storage & Peripherals") %>%
  filter(GICS.Sector == "Information Technology")
AAPL_peer_stocks
```

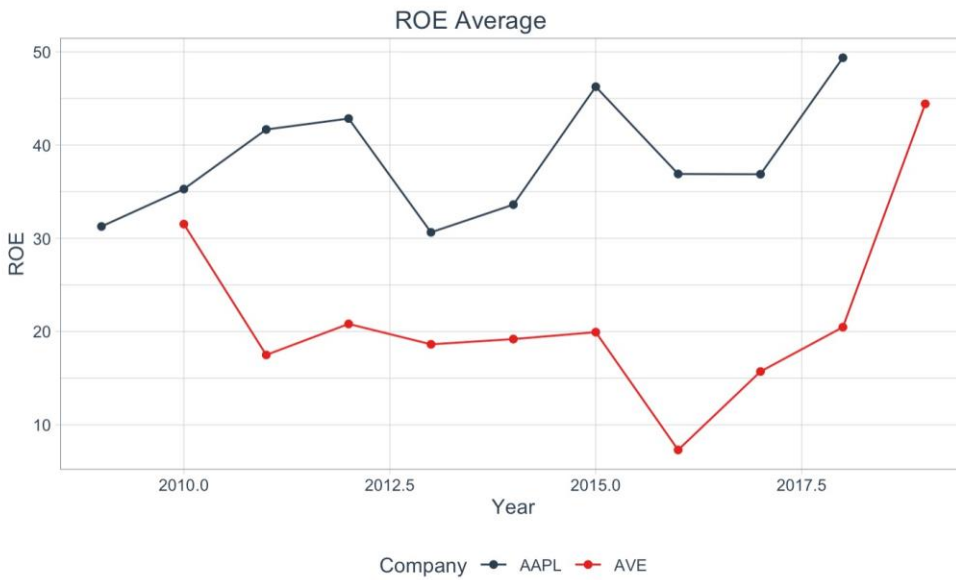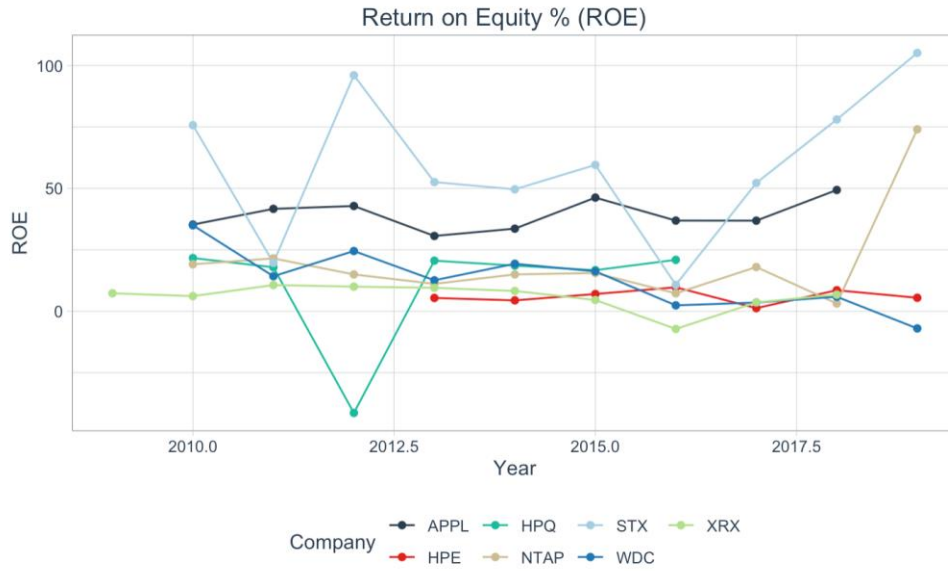| Symbol <fctr>	Security <fctr>	SEC.filings <fctr>	GICS.Sector <fctr>
AAPL	Apple Inc.	reports	Information Technology
HPE	Hewlett Packard Enterprise	reports	Information Technology
HPQ	HP Inc.	reports	Information Technology
NTAP	NetApp	reports	Information Technology
STX	Seagate Technology	reports	Information Technology
WDC	Western Digital	reports	Information Technology
XRX	Xerox	reports	Information Technology

- **Comparing with Peer Stocks**

- When comparing stocks together, there are a number of important factors to consider. According to the Buffettology book, the most important two factors that must be considered at the start are the **marginal profit** (profitability or efficiency) and **inventory turnover.** From the inventory turnover graph, we can tell that AAPL has the absolute advantage in this area comparing to other stocks. As having a high profitability and inventory turnover, this will make sure that AAPL would survive from the bad-news phenomenon. To have a measurement of profitability, gross **margin, operating margin, pretax margin, and net profit margin** all take account.
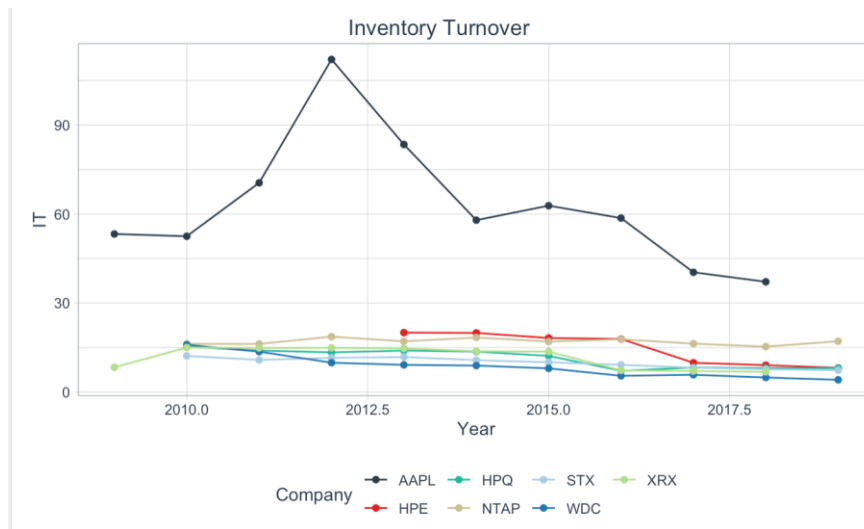

- Inventory turnover is a ratio showing how many times a company has sold and replaced inventory during a given period. We can see the AAPL has the most IT in all the past 10 years and the ratio was much higher than its comparators. This high ratio implies either strong sales or insufficient inventory. This fits in the rule of Buffet that the company can survive when in a bad atmosphere.

Return on Equity % (ROE)

Company: APPL, HPQ, STX, XRX, HPE, NTAP, WDC

## ROE Average

Company: AAPL, AVE

- ROE tells a company's financial performance, it could be considered as the return on net assets to tell a company's efficiency in making a profit. A good ROE for a company is equal to or just above the average for the peer groups. We can see that in the past decade, the ROE of AAPL

was much higher than average, this demonstrates that AAPL was the most efficient company among its competing companies in using the company's assets to create profits.
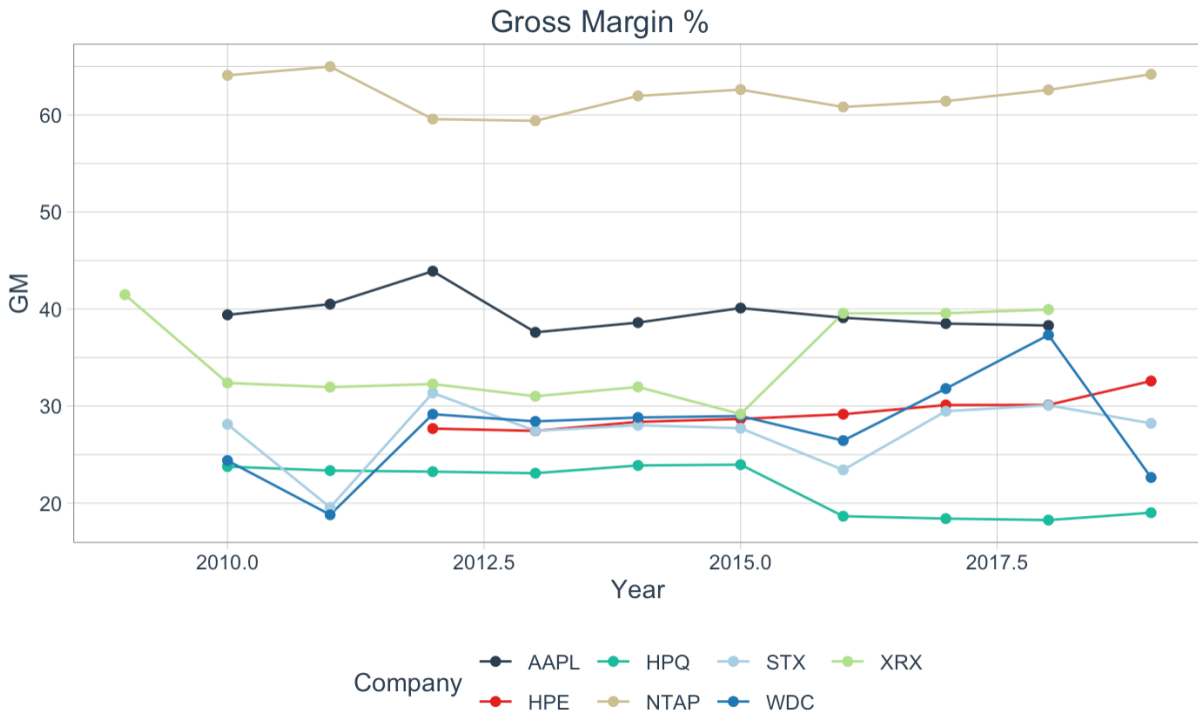

Gross Margin %

• The Gross profit margin tells how good a company is at creating a product or providing a service compared to its competitors. We can see from the GM graph, NTAP had the highest gross among these companies which means that NTAP was more efficient in making a profit. AAPL had a high and relatively stable ratio in this as well, meaning that these two companies had an efficient and mature business model. Also, when all other things equal, they sold products at a premium in the market. On the other hand HPQ, WDC, STX had a low or unstable ratio in gross margin, to make the company more successful, they need to improve this.
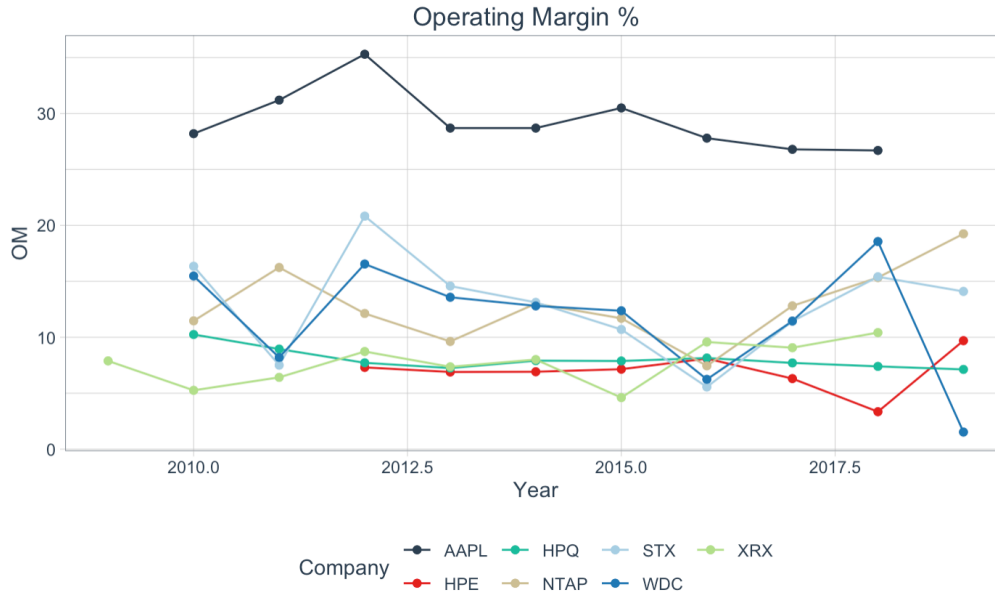
Operating Margin %

- Operating margin shows how much profit is earned for each dollar of sales, it is also an important indicator of the company's efficiency. A good operating margin for a company, in general, is positive and increasing. We can see that AAPL had an absolute advantage in this area, this indicates AAPL highly profitable.


Return on Assets % (ROA)
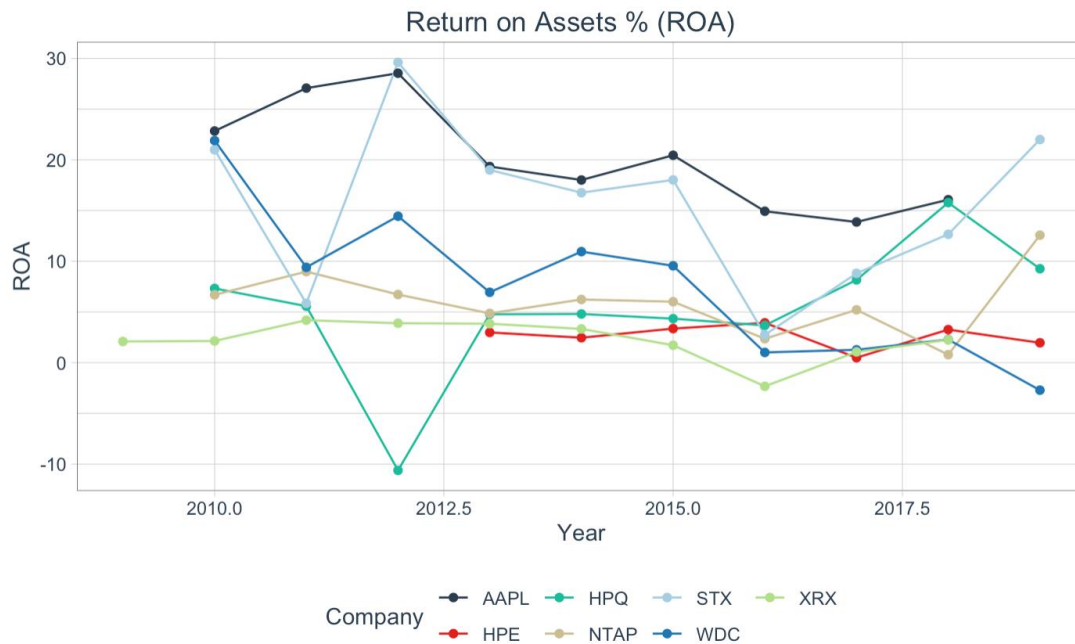
• The main difference between ROA and ROE is that the company takes on financial leverage. We can see AAPL's been in a decreasing trend in the past 10 tears. However, AAPL has the highest ROA on average comparing to others. This illustrates that AAPL makes good use of its total assets.

Financial Leverage
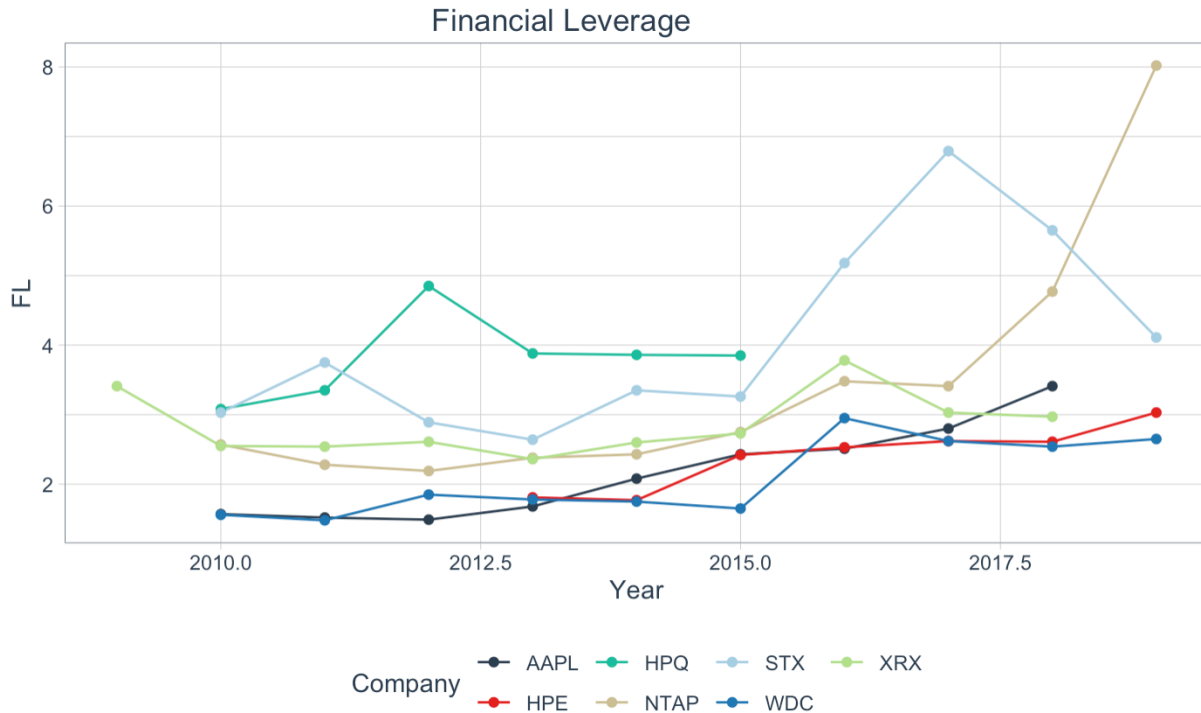
• A high amount of financial leverage increases the risk of failure. In general AAPL was in the group which had a lower FL ratio. This makes sure that AAPL doesn't have much difficulty to pay back the debts, which decreased the risk of going bankrupt.
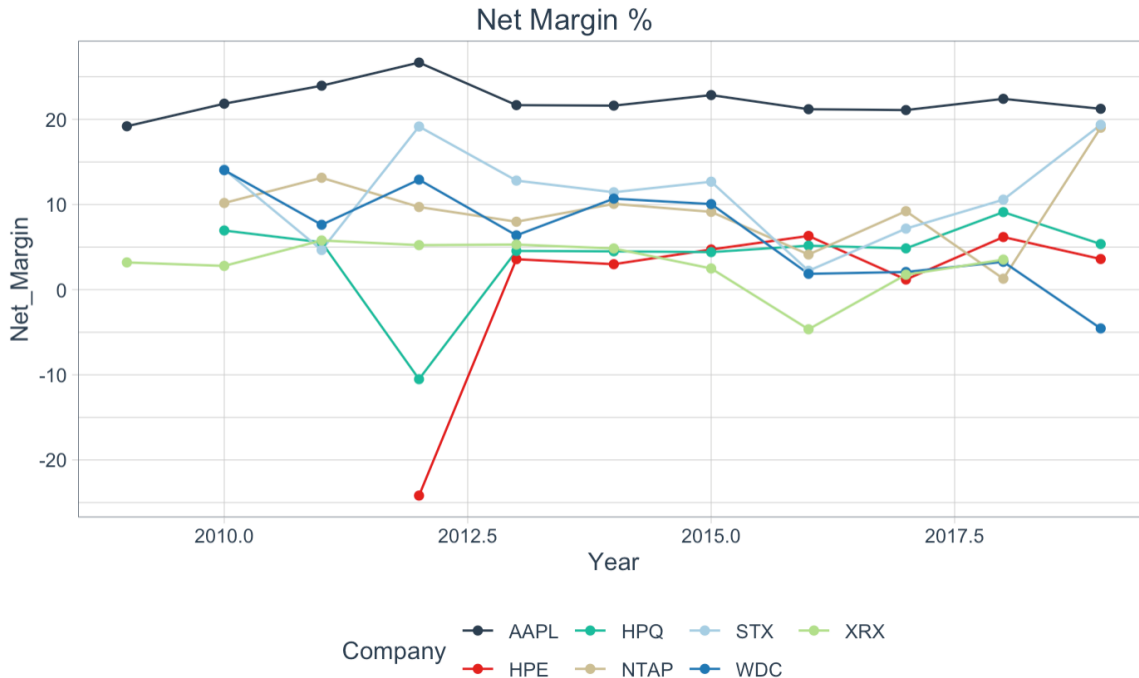
Net Margin %

• The net profit margin tells how much of each dollar in revenue collected by a company translates into profit. It is the most important indicator to tell a company's financial health and allow us to company the profitability of one company to its peer companies. The NM graph above shows clearly that AAPL has been using brilliant practices in earning profit out of sales comparing to others.
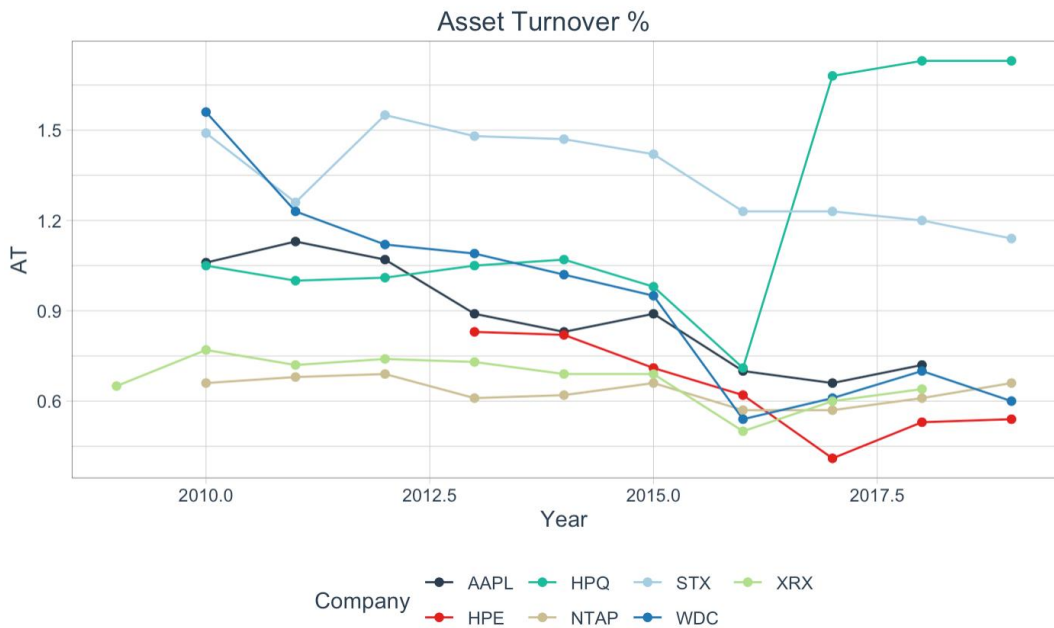
Asset Turnover %

• Asset turnover is the ratio of total sales or revenue to average assets. AAPL did not appear an advantage when comparing with its peer companies, which means that it was not effectively enough using its assets to generate sales.