# Midterm Data Translation Challenge

## Introduction Briefly explain the project's objectives and methodology.

The main objective of this analysis is to gain insights into the financial health and performance of Apple Inc. and Kroger Co. The data utilized in this analysis is sourced from the EDGAR database. Data retrieved from EDGAR has been processed to ensure alignment in the timeframe and set of data used between the two companies. In this analysis, we will be using Form 10-K which provides an annual report and comprehensive summary of a company’s financial performance. To ensure data quality of this analysis, any duplication records have been removed, and only the latest filed data is used. Five key financial ratios -- Current ratio, D/E, ROE, Asset Turnover Ratio, and Net Profit Margin have been strategically selected to cover crucial aspects and offer valuable insights for potential investment opportunities. I hope that this analysis provides you with comprehensive financial insights that help guide investment decisions and aid in the allocation of $1 million for further in-depth analysis.

## Data Retrieval Describe the companies selected and the EDGAR API data retrieval process.

In this analysis, we will evaluate the financial standing of both Apple Inc. and Kroger Co. Below is a brief overview of these two companies.

Apple Inc. is a multinational technology company founded by Steve Jobs, Steve Wozniak, and Ronald Wayne in 1976. Its headquarters are in Cupertino, California, within Silicon Valley. The company is currently led by CEO Mr. Timothy D. Cook and the current number of employees is approximately 161,000. Apple Inc. is classified as a Consumer Electronics industry. According to Forbes, Apple has achieved remarkable success, becoming the first company to reach a net worth of $3 Trillion (Smith, 2022). Apple Inc is primarily recognized for its icon iPhone, but its scope extends across design, development, and sale of consumer electronics, computer software, and online services including products such as iPad, Mac, Apple Watch, and various services such as Apple Arcade, Apple Fitness+, Apple Music, and more. In 2022, Apple’s revenue reached an impressive US$394.3 billion, the highest revenue generated among technology companies. As of March 2023, it was the world’s largest company by market capitalization (Apple Inc., 2024).

Kroger Co. is a retail company founded by Bernard Kroger in 1883. Its headquarters are located in Cincinnati, Ohio. It is under the leadership of the current CEO, Mr. William Rodney McMullen. Kroger operates an extensive network of 2,719 grocery retail stores spread across 35 states in the United States, including the District of Columbia. The store formats include multi-department stores, combo stores, marketplace stores, and price-impact warehouse stores. Additionally, it also has 33 manufacturing plants, 1,642 supermarket fuel centers, 2,254 pharmacies, 225 The Little Clinic in-store medical clinics, and 127 jewelry stores. Its workforce is approximately 465,000 employees in 2022. Kroger stands as one of the largest American-owned private employers in the United States and is ranked #17 on the Fortune 500 rankings of the largest United States corporations by total revenue. In 2022, Kroger generated US$137.888 billion in revenue. (Kroger, 2024). Furthermore, Kroger Co. has a VGM Score of A, indicating it may be undervalued and presenting a potential investment opportunity. (The Kroger Co. - Sell)

#### EDGAR API Data Retrieval Process

Data used in this analysis is sourced from the SEC EDGAR database through the "data.sec.gov" platform, which hosts RESTful APIs in JSON-formatted. The User-Agent specified in the request headers for this connection is “sberg@seattleu.edu”. The initial API call was made to retrieve all companies data from <https://www.sec.gov/files/company_tickers.json>. Using the obtained tickers, I then retrieved the Central Index Keys (cik\_str) to retrieve the filling history from the company facts for both Appl Inc (0000320193) and Kroker Co. (0000056873) through API connection to [https://data.sec.gov/api/xbrl/companyfacts/CIK##########.json](https://data.sec.gov/api/xbrl/companyfacts/CIK#######).

For each file obtained from SEC EDGAR database, data structure and the content were examined. Univariate visualization and summary statistics were used to understand the data relationship, identify trends, check for patterns or anomalies, and assess the need for data cleanup. Any duplicated data found were removed. For this analysis, our focus will be on data extracted from the 10-K Form, and the data between 2017-2023. The following is a list of filling files retrieved for this analysis.

* **RevenueFromContractWithCustomerExcludingAssessedTax**: This data provides revenue information.
* **Assets**: This data provides the total assets as of the balance sheet.
* **AssetsCurrent**: This data provides current assets as of the balance sheet.
* **Liabilities**: This data provides sum of the carrying amounts as of the balance sheet date of all liabilities that are recognized.
* **LiabilitiesCurrent:** This data provides total obligations incurred as part of normal operations that are expected to be paid during the following twelve months or within one business cycle.
* **StockholdersEquity:** This data provides total of all stockholders' equity.
* **NetIncomeLoss**: This data provided the portion of profit or loss for the period.

#### Financial Ratios - Present the calculated financial ratios for each company.

**Apple Inc.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Current Ratio** | **D/E** | **ROE** | **Asset Turnover Ratio** | **Equity Ratio** |
| 2017 | 1.276 | 1.800 | 0.361 |  | 0.357 |
| 2018 | 1.133 | 2.413 | 0.556 | 0.717 | 0.293 |
| 2019 | 1.540 | 2.741 | 0.611 | 0.739 | 0.267 |
| 2020 | 1.364 | 3.957 | 0.879 | 0.829 | 0.202 |
| 2021 | 1.075 | 4.564 | 1.501 | 1.084 | 0.180 |
| 2022 | 0.879 | 5.962 | 1.970 | 1.121 | 0.144 |
| 2023 | 0.988 | 4.673 | 1.561 | 1.087 | 0.176 |

**Kroger Co.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Current Ratio** | **D/E** | **ROE** | **Asset Turnover Ratio** | **Equity Ratio** |
| 2017 | 0.804 | 4.448 | 0.295 |  | 0.183 |
| 2018 | 0.783 | 4.371 | 0.275 | 7.207 | 0.186 |
| 2019 | 0.757 | 3.840 | 0.394 | 6.909 | 0.207 |
| 2020 | 0.765 | 4.264 | 0.193 | 6.585 | 0.190 |
| 2021 | 0.814 | 4.084 | 0.270 | 7.790 | 0.197 |
| 2022 | 0.746 | 4.196 | 0.175 | 8.068 | 0.193 |
| 2023 | 0.735 | 3.944 | 0.223 | 7.766 | 0.202 |

#### Data Analysis and Visualizations- Discuss your observations and insights from the ratio analysis.

**Current Ratio** = Current Assets / Current Liabilities

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Apple’s current ratio shows a downward trend. Until 2022, Apple appears to be able to maintain their current ratio above 1 indicates that they had sufficient liquid assets to cover for short-term debt and other payables. However, the subsequent decline and the drop below 1 after 2022 that I observed coupled with my earlier analysis on their current assets and current liability, raise several concerns. These concerns encompass Apple’s ability to meet short-term obligations with their existing liquid assets, concern on the short-term solvency risk, the concern on their negative working capital which impact their ability to fund the day-to-day operations, and the implications for operational efficiency in managing their current assets and current liabilities.

**Debt-to-Equity Ratio (D/E)** = Total liabilities / Total shareholders' Equity

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According to the above graph, I observed a steady increase in Apple’s Debt-to-Equity ratio between 2013 to the end of 2022. This suggests that Apple is in a risky financial position, with their liabilities increasing in every dollar of shareholders’ equity. This trend could be interpreted as Apple having a less stable capital structure or a reduction in solvency, indicating an increasing reliance on external liability relative to equity. When coupled this analysis with my earlier observations of their total liabilities and shareholders’ equity, they signal an increase of their financial risk as their proportion of financing coming from external sources. The reduction in solvency raises concerns about their ability to cover their obligations from their equity. In summary, the analysis from D/E ratio deepens my concerns about Apple’s overall financial health and stability.

**Equity Ratio** = Shareholder's Equity / Total Assets

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**Return on Equity Ratio (ROE)** = Net Income / Shareholder Equity

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Apple’s Return on Equity remained relatively flat between 2009 to the end of 2017. Subsequently, there was an uptick, and a significantly increased in their ROE from around 2018 to the end of 2022. This indicated that Apple performed very well during these four years, as the increase in ROE demonstrates the ability of Apple in efficiently turn shareholder equity into net income and effectively use their equity capital to generate profits. However, the drop after 2022 signal risk in Apple’s financial health. We need to continue monitoring their financial status to assess whether this trend will persist, look for a signal of potential sustained decline, and whether Apple can reverse the trend and increase their ROE in the following year.

**Asset Turnover Ratio** = Total Revenue / (Beginning Assets + Ending Assets)/2)

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## Conclusion Summarize your findings and any recommendations or insights you have gained.

# References

*Apple Inc.* (2024, January 29). Retrieved from Wikipedia: https://en.wikipedia.org/wiki/Apple\_Inc.

Smith, Z. S. (2022, January 3). *Apple Becomes 1st Company Worth $3 Trillion—Greater Than The GDP Of The UK*. Retrieved from Forbes: https://www.forbes.com/sites/zacharysmith/2022/01/03/apple-becomes-1st-company-worth-3-trillion-greater-than-the-gdp-of-the-uk/?sh=5f84055603fc