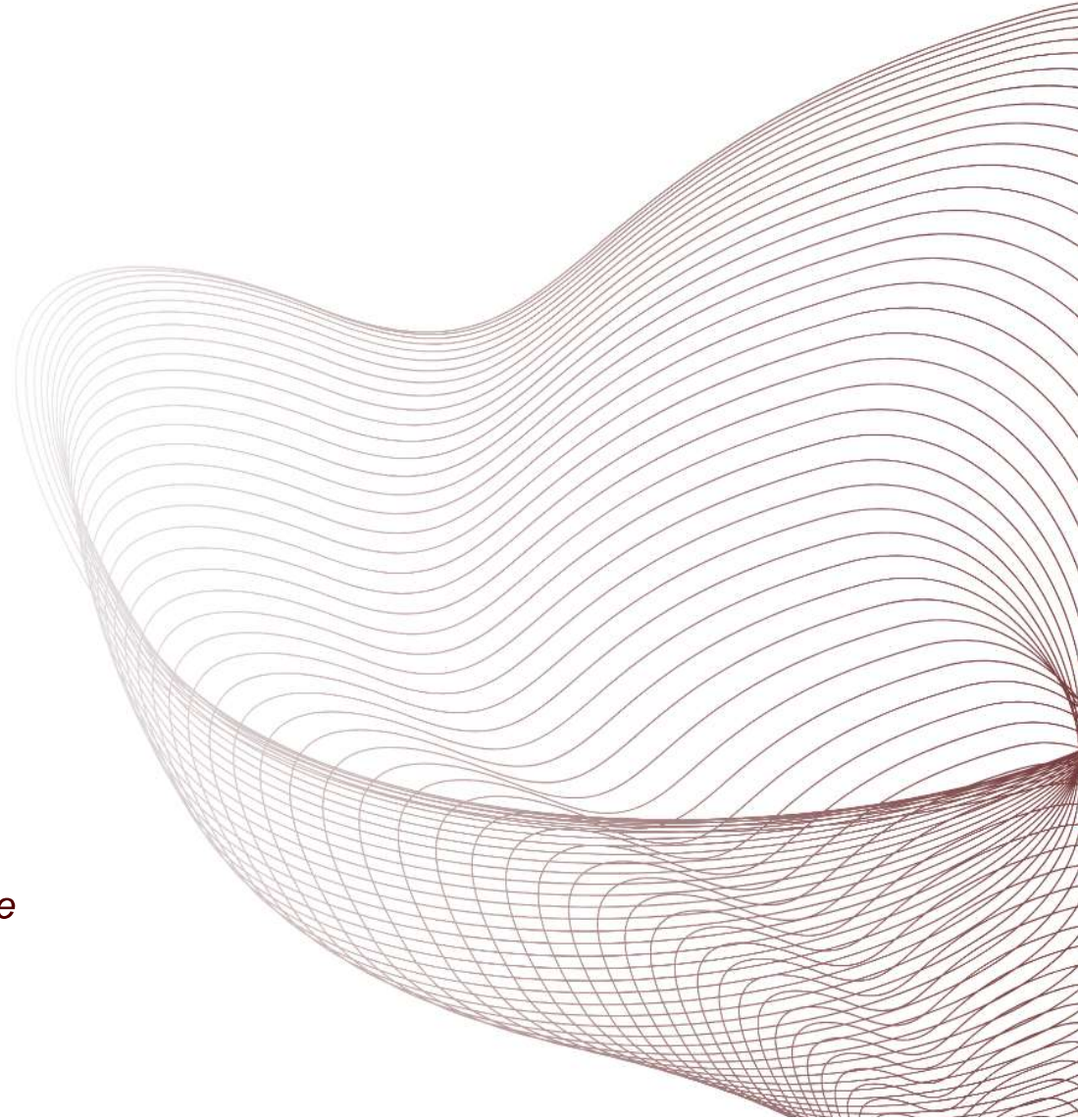


Financial Metrics And Ratios

October 23, 2023

Talk to your neighbor: What do you think is the average length of an annual report (10k)?



What do financial metrics tell us?

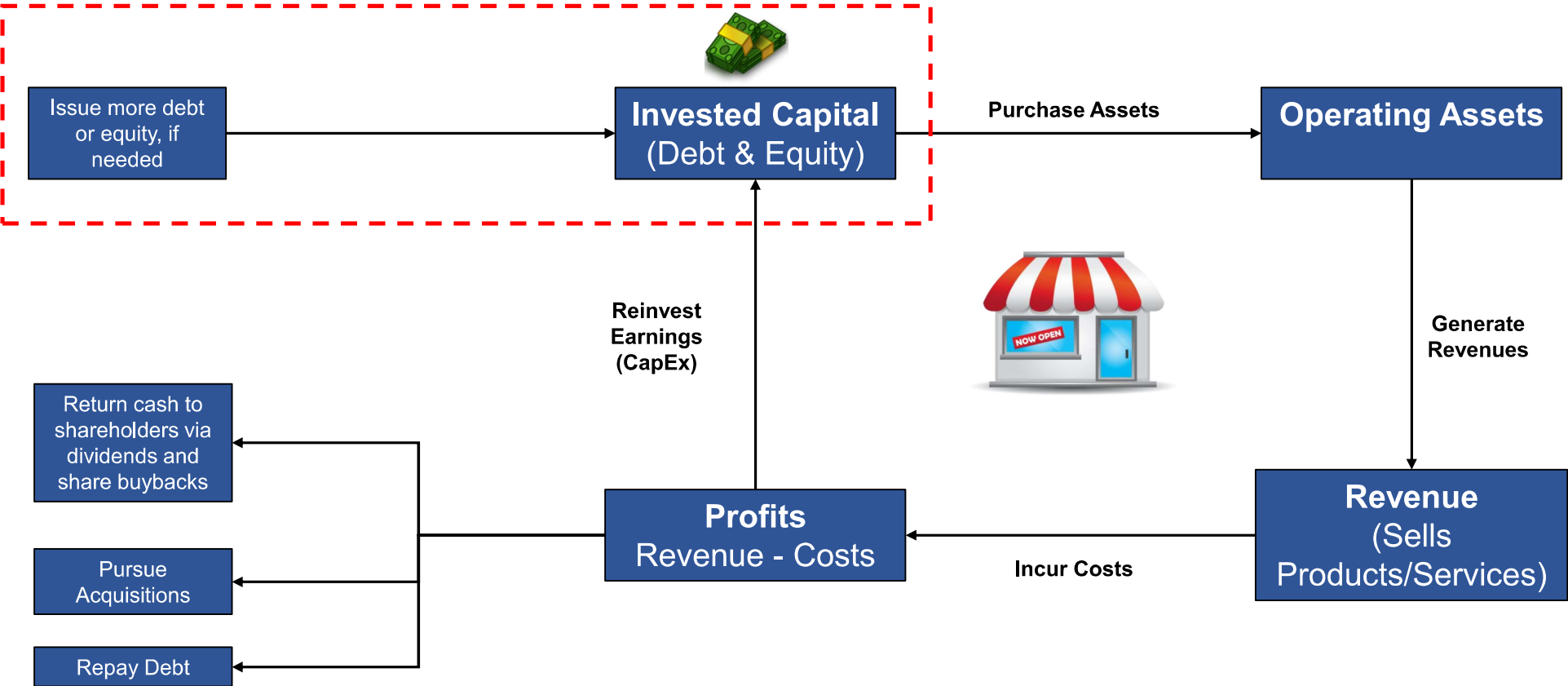
It is **impossible** to understand a business without understanding the information embedded in financial statements.

Ratios & metrics help us **extract** the data in financial statements and turn them into information that we can use to make educated investment decisions.

Financial metrics help us answer questions like:

- Is the business growing? Shrinking?
- How profitable is the business, if at all?
- How capital intensive is the business?
- How much debt is the business using, and is it a healthy amount?
- Is the company able to meet short-term debt obligations?
- Is the company creating or destroying value?
- Is this a good business or a bad business?







How does a business work?



What does capital mean in finance?



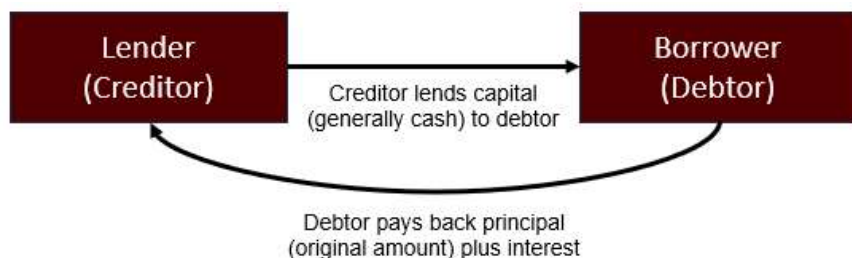
- Businesses need capital to operate... capital is not free, i.e., it has a cost, and different types of capital “cost” different amounts. Cost is measured as a percentage.

| | | |
|---|--|--|
| <p>Prof. Guyton: Mortgage</p>  | <p>35%</p> <p>Walter White: Mortgage</p>  | <p>Mr. Blackburne, AIC SAW Director: Credit Card Loan</p>  |
| <p>US Govt.</p>  | <p>Apple</p>  | <p>15% Phase 1 Biotech Startup</p>  |

Which one has highest risk? Return?

- As an investor (someone who owns capital), I can invest in a wide range of assets with different risk levels
- When investing in a company, my **opportunity cost of capital** is the return I could get on the next best investment of the same level of risk. Therefore, my “required rate of return” is equal to the opportunity cost of capital. The opportunity cost of capital for the investors is the cost of capital for the business.

What are the two types of capital?



$$\text{Cost of Debt} = \text{Interest Rate} * (1 - \text{Tax Rate})$$

$$\text{Cost of Equity} = \text{Risk Free Rate} + \text{Beta} * (\text{Expected Market Return} - \text{Risk Free Rate})$$

Debt

- Contractual obligation to repay the principal (the amount loaned) plus interest.
- Debt holders are **LEGALLY REQUIRED** to pay interest payments.
- The pre-tax cost of debt is interest expense divided by the principal.
 - To find the after-tax cost of debt, we multiply the pre-tax cost of debt times (1-Tax Rate).
 - This is because interest is tax deductible, it comes before tax on the income statement.

Equity

- **No contractual obligation** to pay dividends.
- There is nothing on the income statement that shows a cost of equity.
- The cost of equity is more “theoretical” and is calculated using asset pricing models.
- Asset pricing models try to determine the level of risk an investment entails to determine the corresponding required rate of return.
- Risk is generally considered the volatility and correlation of an asset, relative to the broader market (this is widely debated)

How do you find the cost of Debt + Equity

Debt

Yield to Maturity (YTM) on Company Bonds

| Maturity Date | Issuer | Security Type |
|---------------|--|----------------------|
| Aug-08-2025 | The Sherwin-Williams Company (NYSE:SHW) | Corporate Debentures |

| Seniority | Coupon | Offer Date |
|------------------|--------|-------------|
| Senior Unsecured | 4.250 | Aug-08-2022 |

| Amt. Outstdg. (\$mm) | Current Price | Current YTM | S&P Rating |
|----------------------|---------------|-------------|------------|
| 400.00 | 97.080 | 5.988 | BBB |

This is a market rate!

This is the return that investors believe they should receive for taking on the associated risk. (Required Rate of Return)

Equity

Capital Asset Pricing Model (CAPM)

Cost of Equity = Risk Free Rate + Beta * (Exp. Market Return – Risk Free Rate)

The CAPM model finds the required rate of return for an asset given its risk level.

The model uses the risk-free rate and adjusts the return based on the additional risk taken above the overall market risk.

Risk is defined as Beta

$$\beta_i = \frac{\text{Cov}(r_i, r_m)}{\text{Var}(r_m)}$$

β_i = market beta of asset i

Cov = covariance

Var = variance

r_m = average expected rate of return on the market

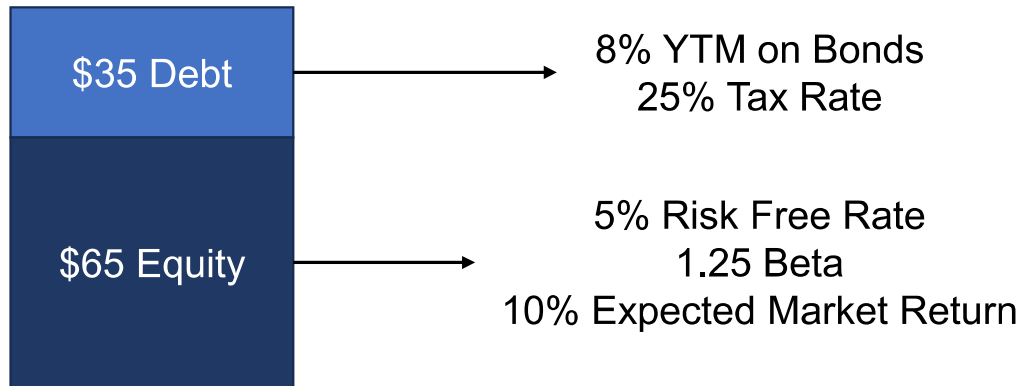
r_i = expected return on an asset i

Weighted Average Cost of Capital

- To determine the overall cost of capital for a business, we need to find the “Weighted Average Cost of Capital” (WACC).
- This uses the weighting of debt and equity the company has (the amount of each as a percentage of total capital) and averages the cost of both together.

$$\text{WACC} = (\% \text{ Weight of Equity} * \text{Cost of Equity}) + (\% \text{ Weight of Debt} * \text{After-Tax Cost of Debt})$$

Example



$$\text{Cost of Debt: } 8\% * (1 - .25) = 6.00\%$$
$$\text{Weight of Debt: } 35 / (35 + 65) = 35\%$$

$$\text{Cost of Equity: } 5\% + 1.25 * (10\% - 5\%) = 11.25\%$$
$$\text{Weight of Equity: } 65 / (35 + 65) = 65\%$$

$$\text{WACC: } (6\% * 35\%) + (11.25\% * 65\%) = \mathbf{9.14\%}$$

Solvency/Liquidity

EBITDA = Earnings Before Interest, Taxes, Depreciation and Amortization
EBIT = Earnings Before Interest and Taxes

Does the business have too much debt?

Will the business be able to meet its interest obligations?

Will the business be able to meet its short-term debt obligations?

Solvency: Ability to meet long-term debt obligations and continue to operate into the future.

Interest Coverage

How many times over could the business pay its interest obligations?

$EBIT / \text{Int Expense}$

Debt / EBITDA

How capable is the company to pay off debt obligations with the cash the business is bringing in?

$\text{Total Debt} / EBITDA$

Debt Ratio

What percentage of the company's capital is debt?

$\text{Debt} / \text{Total capital}$

Liquidity: Ability to meet short-term debt obligations and convert short-term assets to cash quickly.

Current Ratio

Can the company cover all its short-term obligations with current assets?

$\text{Current Assets} / \text{Current Liabilities}$

Quick Ratio

Can the company cover all its ST obligations with current assets, excluding inventory?

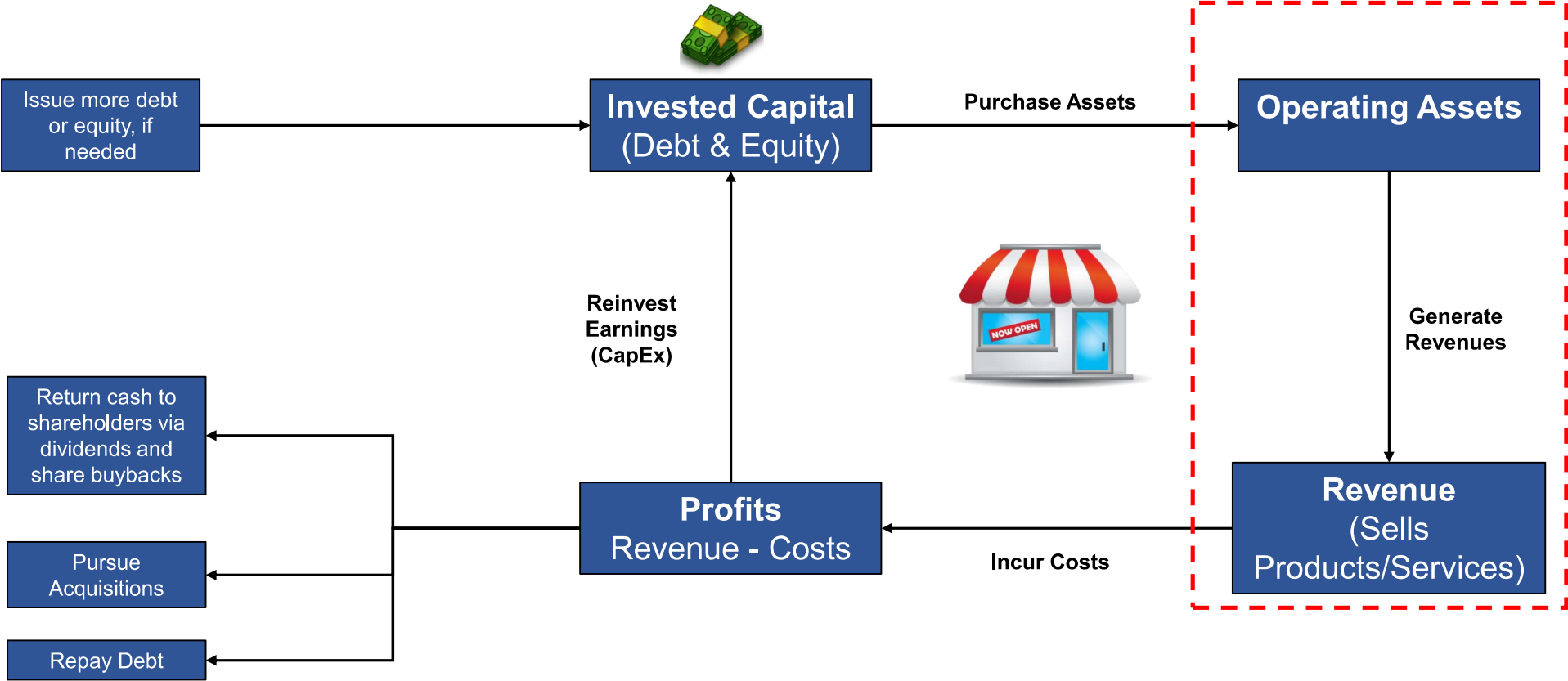
$(\text{Current Assets} - \text{Inventory}) / \text{Current Liabilities}$

Cash Conv. Cycle

How long does it take for companies to convert newly purchased inventory into cash?

$\text{Days Inv. Outs.} + \text{Days Sales Outs.} - \text{Days Pay. Outs.}$

How does a business work?



Operating Asset Turnover

How efficiently are assets being used to generate revenue?
How capital intensive is the business?

$$\text{Asset Turnover} = \text{Revenue} / \text{Average Operating Assets}$$

Asset turnover tells you how many dollars are generated for each dollar of operating assets the business has.



Revenue: 24,140M
Average Op. Assets: 65,942M

Asset Turnover: 0.37x

Union Pacific generates \$0.37 of revenue for every \$1 of assets it owns.



Revenue: 630,794M
Average Op. Assets: 251,160M

Asset Turnover: 2.51x

Walmart generates \$2.51 of revenue for every \$1 of assets it owns.

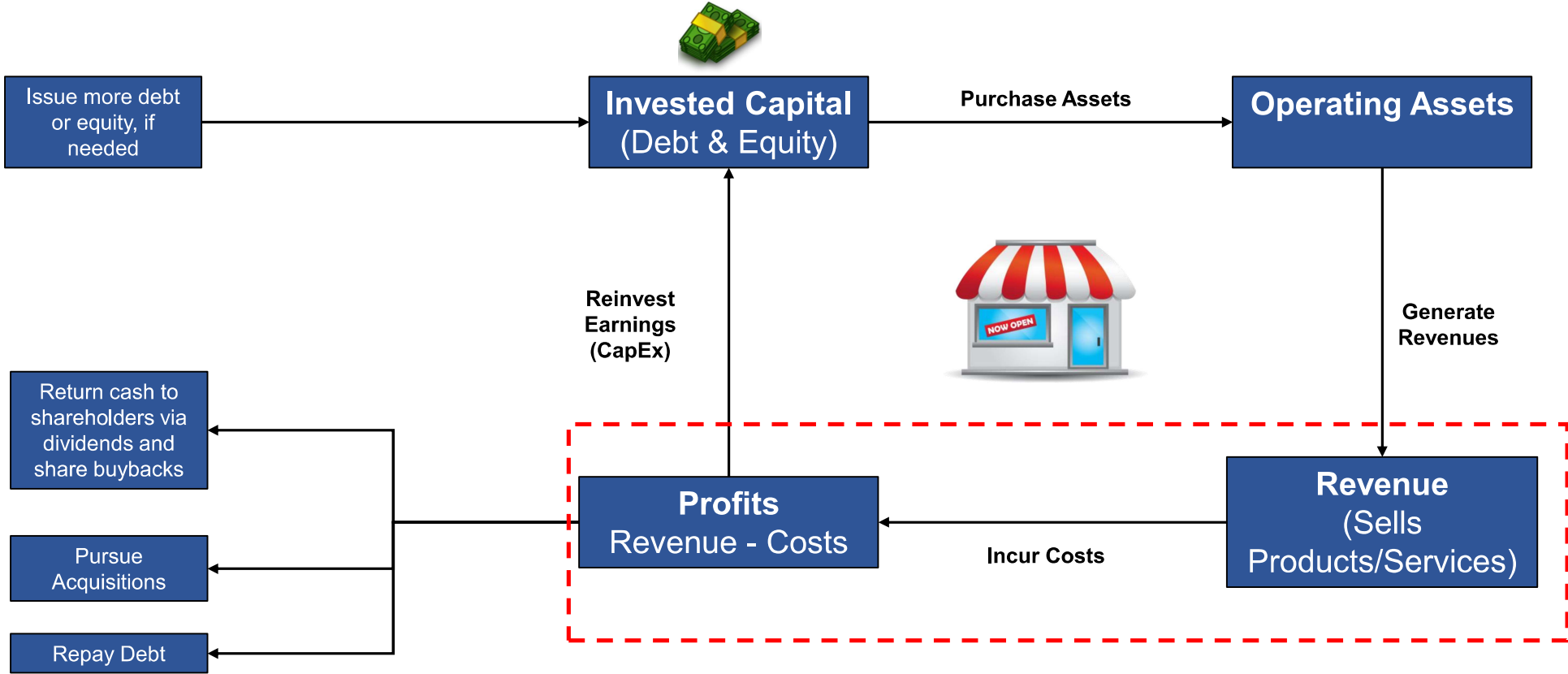


Revenue: 383,933M
Average Op. Assets: 335,674M

Asset Turnover: 1.14x

Apple generates \$1.14 of revenue for every \$1 of assets it owns.

How does a business work?



Operating Metrics (Income Statement)

| | | | | | | |
|---------|---|---|-------------------------------------|-----------------------------|-----------------------------|-----------------------------|
| Revenue | Cost of Goods Sold | Cost of Goods Sold | Cost of Goods Sold | Cost of Goods Sold | Cost of Goods Sold | |
| | Gross Profit | SG&A Exp. R&D Exp. | SG&A Exp. R&D Exp. | SG&A Exp. R&D Exp. | SG&A Exp. R&D Exp. | |
| | | Earnings Before Interest, Taxes, Depreciation and Amortization EBITDA | Depreciation & Amortization | Depreciation & Amortization | Depreciation & Amortization | Depreciation & Amortization |
| | Earnings Before Interest Taxes EBIT | | Interest Expense | Interest Expense | Interest Expense | Interest Expense |
| | | | Earnings Before Taxes EBT | Tax Expense | Tax Expense | Tax Expense |
| | Net Income | Net Income | | Net Income | Net Income | Net Income |

Margins

How efficiently is the business able to convert revenue into different types of “profit”?

| | | | | | |
|---------|--|--|--|--|---|
| Revenue | Cost of Goods Sold | Cost of Goods Sold | Cost of Goods Sold | Cost of Goods Sold | Cost of Goods Sold |
| | Gross Profit | SG&A Exp. R&D Exp. | SG&A Exp. R&D Exp. | SG&A Exp. R&D Exp. | SG&A Exp. R&D Exp. |
| | | Earnings Before Interest, Taxes, Depreciation and Amortization EBITDA | Depreciation & Amortization | Depreciation & Amortization | Depreciation & Amortization |
| | Earnings Before Interest Taxes EBIT | | Interest Expense | Interest Expense | Interest Expense |
| | | Earnings Before Taxes EBT | Tax Expense | Tax Expense | Tax Expense |
| | Net Income | | Net Income | Net Income | Net Income |
| | Gross Margin How much profit is the business able to generate directly from the sale of products/ services? Gross Profit / Revenue | EBITDA Margin How much operating profits before non-cash expenses can the company generate? EBITDA / Revenue | EBIT Margin How much operating profits before can the company generate? EBIT / Revenue | EBT Margin How much operating profits before non-cash expenses can the company generate? EBT / Revenue | Net Income Margin How much profits available to equity holders can the company generate? Net Income / Revenue |

CapIQ Margins Example



Compare margins over time

| For the Fiscal Period Ending | 12 months Sep-29-2018 | 12 months Sep-28-2019 | 12 months Sep-26-2020 | 12 months Sep-25-2021 | 12 months Sep-24-2022 | 12 months Jul-01-2023 |
|---------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Margin Analysis | | | | | | |
| Gross Margin % | 38.3% | 37.8% | 38.2% | 41.8% | 43.3% | 43.4% |
| SG&A Margin % | 6.3% | 7.0% | 7.3% | 6.0% | 6.4% | 6.6% |
| EBITDA Margin % | 30.8% | 29.4% | 28.2% | 32.9% | 33.1% | 32.3% |
| EBITA Margin % | 26.7% | 24.6% | 24.1% | 29.8% | 30.3% | 29.2% |
| EBIT Margin % | 26.7% | 24.6% | 24.1% | 29.8% | 30.3% | 29.2% |
| Earnings from Cont. Ops Margin % | 22.4% | 21.2% | 20.9% | 25.9% | 25.3% | 24.7% |
| Net Income Margin % | 22.4% | 21.2% | 20.9% | 25.9% | 25.3% | 24.7% |
| Net Income Avail. for Common Margin % | 22.4% | 21.2% | 20.9% | 25.9% | 25.3% | 24.7% |
| Normalized Net Income Margin % | 17.2% | 15.8% | 15.3% | 18.7% | 18.9% | 18.1% |
| Levered Free Cash Flow Margin % | 17.9% | 16.5% | 22.0% | 20.0% | 22.9% | 23.6% |
| Unlevered Free Cash Flow Margin % | 18.6% | 17.4% | 22.7% | 20.5% | 23.3% | 24.2% |

| Company Name | LTM Gross Margin % | LTM EBITDA Margin % | LTM EBIT Margin % | LTM Net Income Margin % |
|---|-----------------------|------------------------|----------------------|----------------------------|
| Alphabet Inc. (NasdaqGS:GOOGL) | 55.6% | 31.6% | 26.4% | 21.05% |
| Dell Technologies Inc. (NYSE:DELL) | 23.4% | 8.8% | 5.5% | 2.03% |
| HP Inc. (NYSE:HPQ) | 20.6% | 9.2% | 7.6% | 4.27% |
| NVIDIA Corporation (NasdaqGS:NVDA) | 64.6% | 37.9% | 33.0% | 31.60% |
| Hewlett Packard Enterprise Company (NYSE:HPE) | 34.6% | 17.7% | 9.0% | 3.64% |
| Samsung Electronics Co., Ltd. (KOSE:A005930) | 32.0% | 19.9% | 6.1% | 13.13% |
| NetApp, Inc. (NasdaqGS:NTAP) | 67.1% | 21.0% | 17.6% | 19.49% |
| QUALCOMM Incorporated (NasdaqGS:QCOM) | 56.3% | 34.3% | 29.5% | 22.33% |
| Western Digital Corporation (NasdaqGS:WDC) | 15.3% | (2.1%) | (8.8%) | (13.85%) |
| Sonim Technologies, Inc. (NasdaqCM:SONM) | 16.3% | 2.3% | (0.7%) | (1.97%) |
| Apple Inc. (NasdaqGS:AAPL) | 43.4% | 32.3% | 29.2% | 24.68% |

Compare margins to other companies

CapIQ Growth Example



How fast is the business growing/shrinking revenue, profits, assets, etc.?

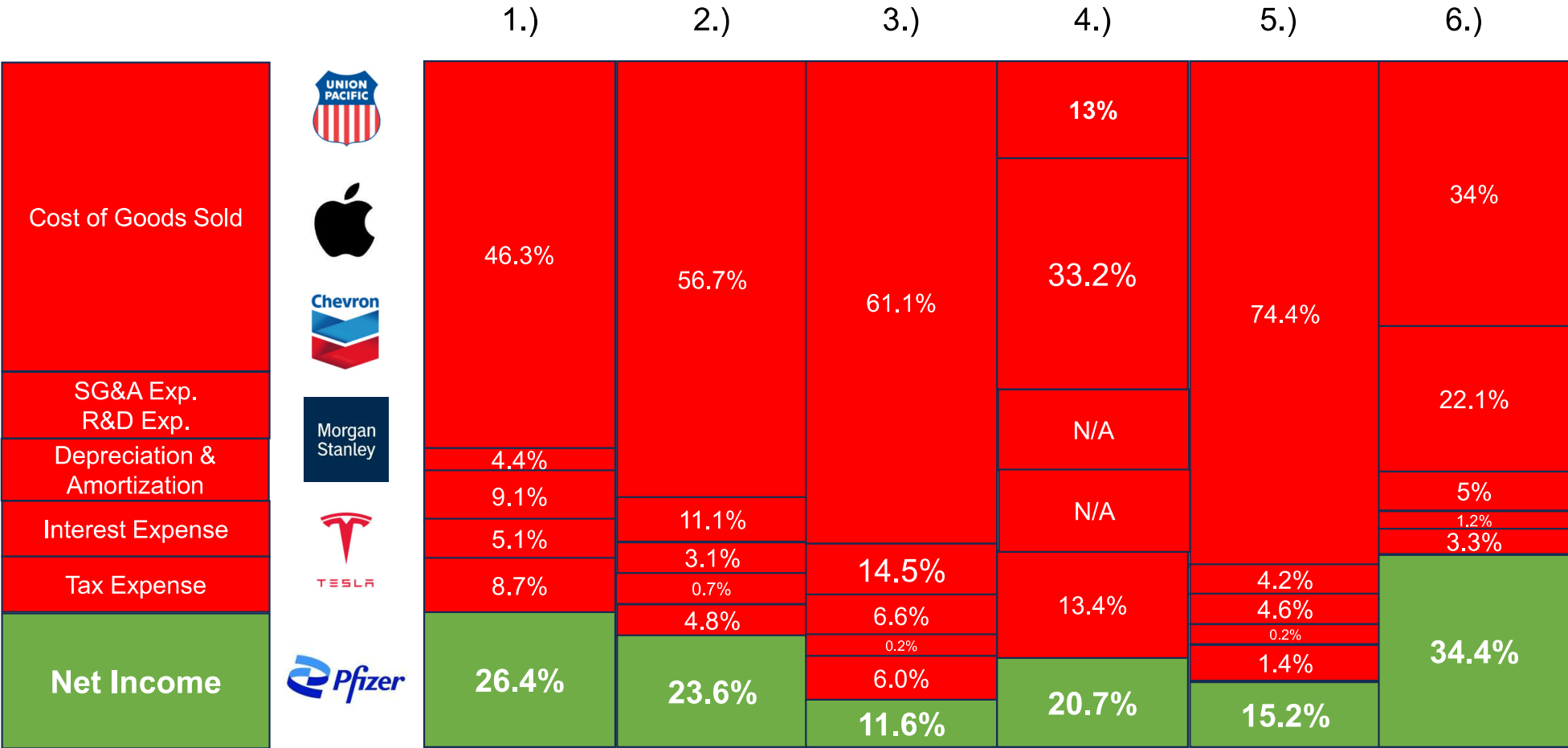
Growth over time

| For the Fiscal Period Ending | 12 months Sep-29-2018 | 12 months Sep-28-2019 | 12 months Sep-26-2020 | 12 months Sep-25-2021 | 12 months Sep-24-2022 | 12 months Jul-01-2023 |
|-------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Growth Over Prior Year | | | | | | |
| Total Revenue | 15.9% | (2.0%) | 5.5% | 33.3% | 7.8% | (0.9%) |
| Gross Profit | 15.5% | (3.4%) | 6.7% | 45.6% | 11.7% | (0.6%) |
| EBITDA | 14.4% | (6.5%) | 1.1% | 55.5% | 8.6% | (4.3%) |
| EBITA | 15.6% | (9.8%) | 3.7% | 64.4% | 9.6% | (5.2%) |
| EBIT | 15.6% | (9.8%) | 3.7% | 64.4% | 9.6% | (5.2%) |
| Earnings from Cont. Ops. | 23.1% | (7.2%) | 3.9% | 64.9% | 5.4% | (4.9%) |
| Net Income | 23.1% | (7.2%) | 3.9% | 64.9% | 5.4% | (4.9%) |
| Normalized Net Income | 13.8% | (9.8%) | 2.1% | 62.8% | 9.1% | (5.4%) |
| Diluted EPS before Extra | 29.4% | (0.3%) | 10.4% | 71.0% | 8.9% | (1.5%) |
| Accounts Receivable | 29.7% | (1.1%) | (29.7%) | 63.0% | 7.3% | (10.3%) |
| Inventory | (18.5%) | 3.8% | (1.1%) | 62.0% | (24.8%) | 35.3% |
| Net PP&E | 22.3% | (9.5%) | 21.3% | 9.2% | 6.1% | 8.0% |
| Total Assets | (2.6%) | (7.4%) | (4.3%) | 8.4% | 0.5% | (0.4%) |
| Tangible Book Value | (20.1%) | (15.5%) | (27.8%) | (3.4%) | (19.7%) | 3.7% |
| Common Equity | (20.1%) | (15.5%) | (27.8%) | (3.4%) | (19.7%) | 3.7% |
| Cash from Ops. | 20.6% | (10.4%) | 16.3% | 29.0% | 17.4% | (4.4%) |
| Capital Expenditures | 6.9% | (21.2%) | (30.4%) | 51.7% | (3.4%) | 13.6% |
| Levered Free Cash Flow | 19.8% | (9.6%) | 40.7% | 21.4% | 23.1% | 8.8% |
| Unlevered Free Cash Flow | 20.5% | (8.8%) | 37.7% | 20.5% | 22.8% | 9.3% |
| Dividend per Share | 13.3% | 10.3% | 6.0% | 6.9% | 5.9% | 4.5% |

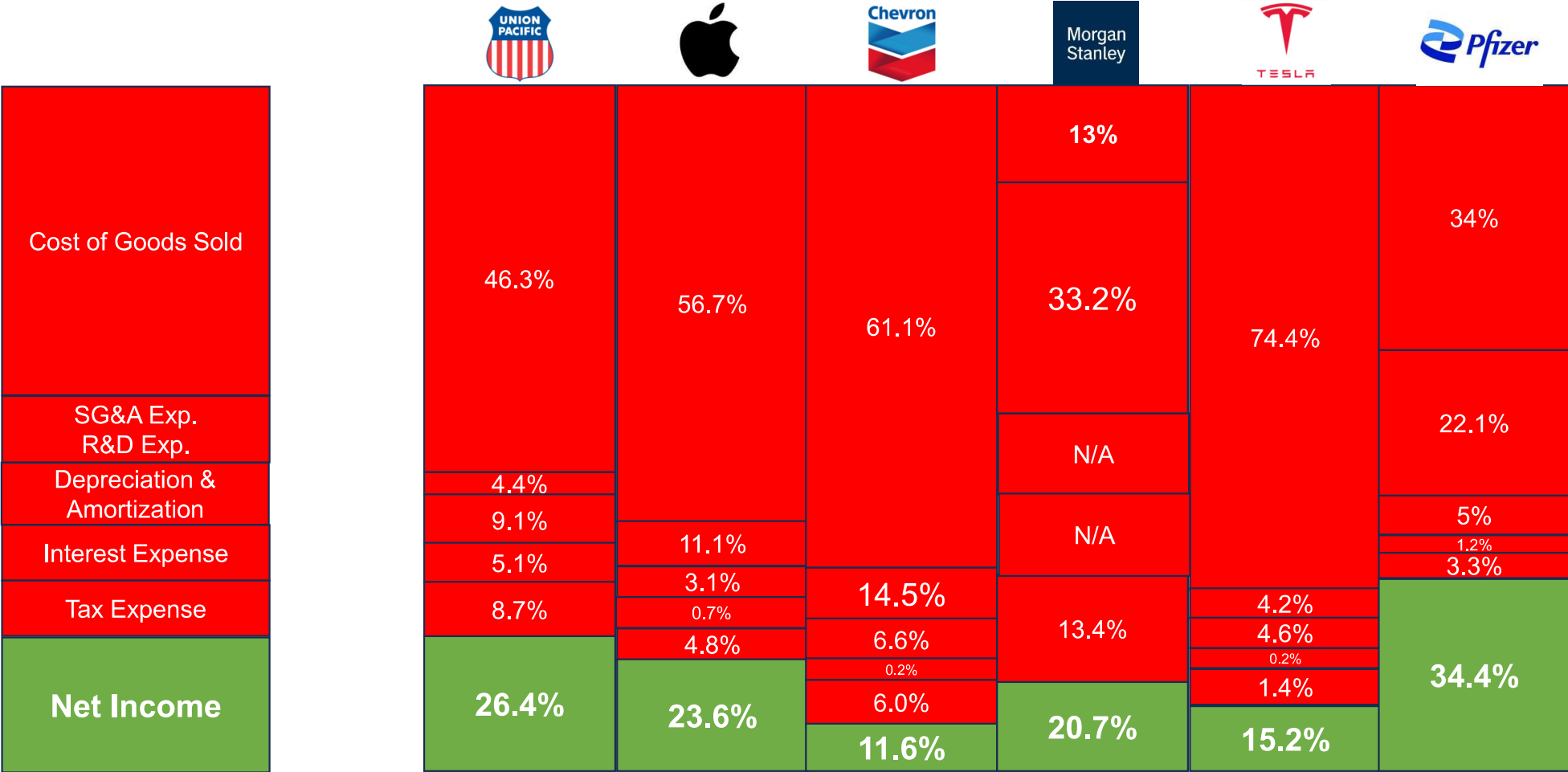
| Company Name | LTM Total Revenues, 1 Yr Growth % | LTM EBITDA, 1 Yr Growth % | LTM EBIT, 1 Yr Growth % | LTM Net Income, 1 Yr Growth % |
|---|--------------------------------------|------------------------------|----------------------------|----------------------------------|
| Alphabet Inc. (NasdaqGS:GOOGL) | 4.10% | (5.69%) | (7.18%) | (15.36%) |
| Dell Technologies Inc. (NYSE:DELL) | (12.47%) | (6.40%) | (5.30%) | (64.92%) |
| HP Inc. (NYSE:HPQ) | (15.53%) | (17.46%) | (21.42%) | (62.63%) |
| NVIDIA Corporation (NasdaqGS:NVDA) | 9.90% | 15.91% | 15.35% | 33.39% |
| Hewlett Packard Enterprise Company (NYSE:HPE) | 5.99% | 12.63% | 23.81% | (71.03%) |
| Samsung Electronics Co., Ltd. (KOSE:A005930) | (11.30%) | (43.19%) | (71.56%) | (20.52%) |
| NetApp, Inc. (NasdaqGS:NTAP) | (3.87%) | (5.37%) | (9.69%) | 27.40% |
| QUALCOMM Incorporated (NasdaqGS:QCOM) | (8.44%) | (15.95%) | (18.87%) | (33.01%) |
| Western Digital Corporation (NasdaqGS:WDC) | (34.45%) | - | - | - |
| Sonim Technologies, Inc. (NasdaqCM:SONM) | 74.95% | - | - | - |
| Apple Inc. (NasdaqGS:AAPL) | (0.93%) | (4.32%) | (5.16%) | (4.89%) |

Growth relative to other companies

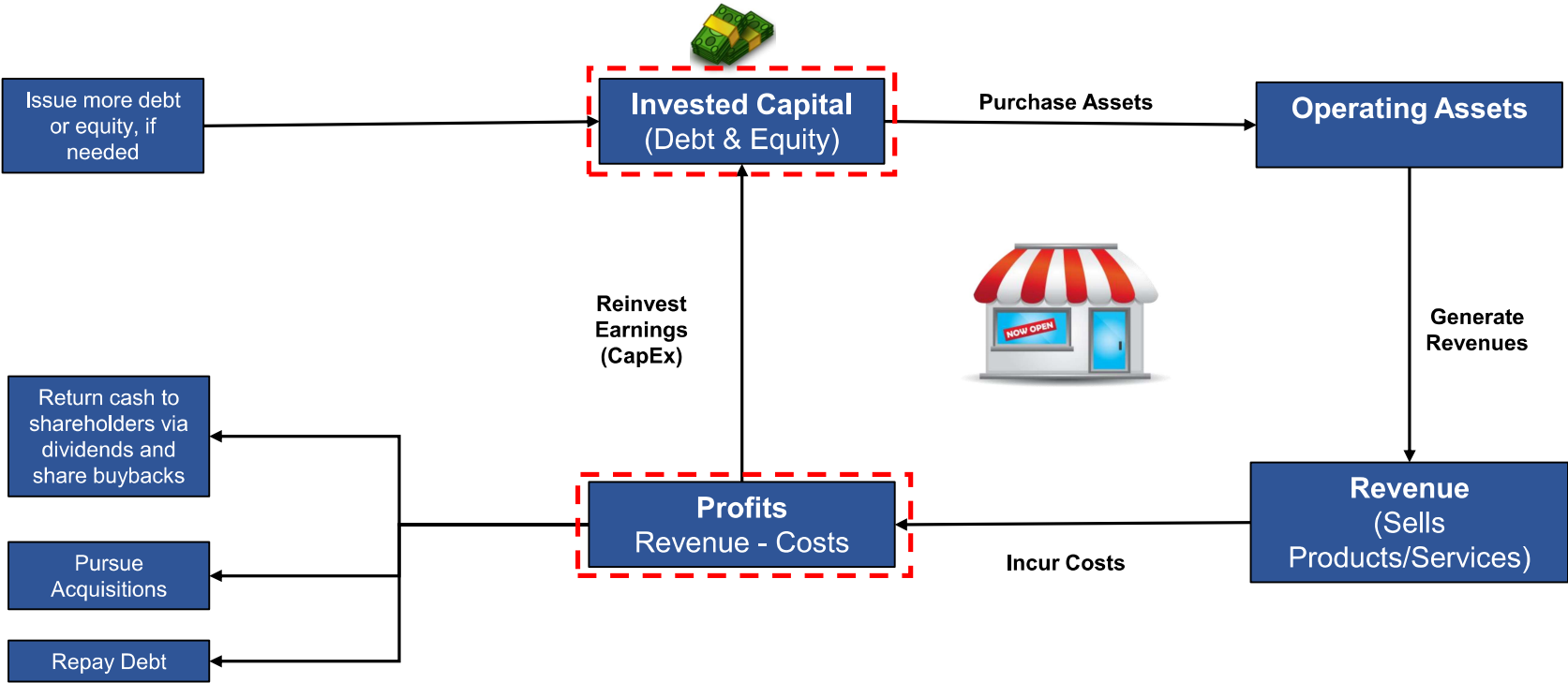
Operating Metrics Activity (FY 2022)



Operating Metrics Activity (FY 2022)



Returns on Capital



Return on Invested Capital (ROIC)

$EBIT * (1 - Tax Rate) = NOPAT$
NOPAT = Net Operating Profit After Taxes

How much profit is the company generating for every dollar of capital invested into the business?

$$EBIT * (1 - Tax Rate) / Invested Capital = Return on Invested Capital (ROIC)$$

EBIT * (1 - Tax Rate)

AKA Net Operating Profit After Taxes (NOPAT)

Measures the profit of a business, while ignoring the capital structure of the business.

It ignores the capital structure by not accounting for interest expense.

Invested Capital

Net Working Capital + Net Fixed Assets + Net Intangible Assets

Or

Long Term Debt + Short Term Debt + Leases + Equity

Invested Capital = Operating Assets

Measures the total amount of capital that has been invested in the business.

ROIC Continued

How efficiently can the business turn assets into revenues?

Operating Asset Turnover
 $\text{Revenue} / \text{Operating Assets}$



How efficiently can the business turn revenues into profits?

$\text{EBIT} * (1 - \text{Tax Rate})$



Return on Invested Capital (ROIC)

How efficiently can the business turn assets (invested capital) into profits?

| | | |
|--|--|--|
| Operating Asset Turnover | NOPAT Margins | ROIC |
| $\frac{\text{Revenue}}{\text{Operating Assets}}$ | \times $\frac{\text{NOPAT}}{\text{Revenue}}$ | $=$ $\frac{\text{NOPAT}}{\text{Operating Assets}}$ |

Value Creation

WACC v. ROIC

What is the opportunity cost of the capital?

ROIC < WACC = Value Destruction

ROIC > WACC = Value Creation

What returns did the company generate on its capital?

If a company can not generate returns above its cost of capital, then it is destroying value for its investors. This means that the opportunity cost, the returns investors could get on other investment opportunities of equal risk, exceeded the return the business was able to generate.