Walmart Valuation

MGMT 675: AI-Assisted Financial Analysis

Outline

- Review of Two/Three Stage Growth Model
- When a Firm Only Earns its Cost of Capital
- Review of Enterprise Valuation
- Walmart Valuation

Two/Three Stage Growth Model

Last Stage

- Assume everything grows at the same rate g from year T onwards.
- Then the value of the firm at T is

$$V_T = \frac{D_{T+1}}{k - g}$$

  where D_{T+1} is the dividend in year $T + 1$ and k is the discount rate.
- Define the payout rate $\pi = D_{T+1}/E_{T+1}$, where E_{T+1} is earnings in year $T + 1$.
- Then $D_{T+1} = \pi E_{T+1}$.
- Substituting, we get

$$V_T = \frac{\pi E_{T+1}}{k - g}$$

Value to Book Ratio

- Define ROE as $\text{ROE} = E_{T+1}/B_T$ where B_T is the book value of the firm at time T. Then $E_{T+1} = B_T \times \text{ROE}$.

- Substituting, we get

$$V_T = \frac{\pi B_T \times \text{ROE}}{k - g}$$

- So, the value to book ratio is

$$\frac{V_T}{B_T} = \frac{\pi \times \text{ROE}}{k - g}$$

ROE and Growth

- You probably know the formula $g = (1 - \pi) \times \text{ROE}$.
- This can be seen easily by looking at the growth in book equity.
  - The change in book equity is

$$B_{T+1} - B_T = E_{T+1} - D_{T+1} = (1 - \pi)E_{T+1} = (1 - \pi)B_T \times \text{ROE}$$

  - Therefore, the growth rate is

$$g = \frac{B_{T+1} - B_T}{B_T} = (1 - \pi) \times \text{ROE}$$

Summary

Substituting for g, we get

$$V_T = \frac{\pi E_{T+1}}{k - (1 - \pi) \times \text{ROE}}$$

$$\frac{V_T}{B_T} = \frac{\pi \times \text{ROE}}{k - (1 - \pi) \times \text{ROE}}$$

When a Firm Only Earns its Cost of Capital

When a Firm Only Earns its Cost of Capital

- Suppose the firm only earns its cost of capital in the last stage, meaning ROE $= k$.

- Then,

$$\frac{V_T}{B_T} = \frac{\pi k}{k - (1-\pi)k} = \frac{\pi k}{\pi k} = 1$$

$$V_T = \frac{\pi E_{T+1}}{k - (1-\pi)k} = \frac{\pi E_{T+1}}{\pi k} = \frac{E_{T+1}}{k}$$

- Payout rate and growth rate do not matter if a firm is earning exactly its cost of capital (NPV of all growth is zero).

- Also, we have $E_{T+1} = kB_T \Rightarrow B_T = E_{T+1}/k$.

Caution about First (or First and Second) Stage

- Case Exhibit 4 makes assumptions about earnings growth and payout rates.
- Earnings + payout rate $\Rightarrow$ book equity growth

$$\Delta \text{Book Equity} = \text{Earnings} - \text{Payouts}$$

- Book equity + earnings $\Rightarrow$ ROE. Should check if implied ROE assumptions are reasonable.
- Also, assumptions are likely to be inconsistent.
  - We have $E_{T+1} = \text{ROE} \times B_T = kB_T$.
  - So book equity at T must be E_{T+1}/k. This is unlikely to be true, given starting book equity and implied first-stage book equity growth. Exhibit 4.
- I prefer making assumptions about ROE and payout rates instead of growth and payout rates. Actually, better to make assumptions about the determinants of ROE. Actually, better to do enterprise valuation.

Enterprise Valuation

Enterprise Valuation: Definitions

- Invested Capital $=$ Operating Assets minus Operating Liabilities (more later)
- Net Operating Profit After Taxes Don't deduct interest in income statement. Net income replaced by NOPAT (sometimes called NOPLAT or EBIAT)
- Return on Invested Capital $\text{ROIC}_t = \text{NOPAT}_t / \text{Invested Capital}_{t-1}$
- Plowback rate $= \Delta \text{Invested Capital}_t / \text{NOPAT}_t$
- Payout rate $\pi = 1 - \text{plowback rate}$
- Free cash flow $= \text{NOPAT} - \Delta \text{ Invested Capital} = \pi \times \text{NOPAT}$

Enterprise Value and Equity Value

- Enterprise Value = present value of free cash flow discounted at WACC

- Equity Value = Enterprise Value - Debt - Minority Interests + Value of Equity in Nonconsolidated Subsidiaries

Enterprise Valuation: Last Stage

- In perpetual constant growth, the growth rate is

$$g = (1 - \pi) \times \text{ROIC}$$

- Enterprise value at T is

$$\frac{\text{FCF}_{T+1}}{\text{WACC} - g}$$

- Earning cost of capital means $\text{ROIC} = \text{WACC}$. Then the enterprise value at T is

$$\text{Invested Capital}_T = \frac{\text{NOPAT}_{T+1}}{\text{WACC}}$$

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- Case data
- Julius thread
- NOPAT and Invested Capital calculation in Excel
- Walmart Forecast Model from Julius