

Corporate Finance II

Session II

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Company Valuation Methods

- Book Value
- Comparable Companies or Earnings Multiple Method
- Liquidation Value
- Discounted Cash Flow Method
 - APV Model
 - Equity DCF Model
- Economic Profit Method
- Option Valuation Method

II.1 Book Value

firm value = book value of all assets

- One of the most widely used methods
- Based on historical numbers
- Ignores future
- Accounting numbers are flawed and can be easily manipulated
- Ignores intangibles
- Ignores risk
- Price paid for an asset may have no relation to its value in operation or if it had to be sold or replaced

II.2 Comparable Companies Method

Most common multiple used:

$$\begin{aligned} V/EBIT &= \\ &= \frac{\text{Market Value of Company}}{\text{Earnings Before Interest and Tax}} \\ &= \frac{\text{Debt} + \text{Equity}}{\text{Earnings Before Interest and Tax}} \end{aligned}$$

Estimate of the market value of an asset:

$$\text{Market Value of Asset} = \left(\frac{V}{EBIT} \right)^{\text{comp}} \times \text{EBIT}$$

where $\left(\frac{V}{EBIT} \right)^{\text{comp}}$ is the value - to - earnings ratio of a comparable traded company (or average of a group of companies).

Pros & Cons:

- + Easy to use method
- $V/EBIT$ is accounting figure and probably not a meaningful economic quantity
- earnings are subject to short-term fluctuations, but important are stationary earnings figures (adjust for temporary shocks if possible)
- $V/EBIT$ assumes that all companies can generate the same growth

Other multiples used:

Price/Net Earnings, Price/Sales,
Market Value/Book Value,
Asset Value/ EBIT, ...

II.3 Discounted Cash Flow Method

Procedure:

1. Forecast free cash flows during forecast horizon
2. Estimate the cost of capital (weighted average cost of capital – WACC)
3. Estimate continuing value (= value after forecast horizon)
4. Discount to the present
5. Add the value of excess cash and other non-operating assets
6. Deduct financial debt to get market value of equity

Example: horizon 5 years, WACC = 10%

| <u>Time</u> | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> |
|------------------|----------|----------|----------|----------|----------|
| FCF | 300 | 250 | 270 | 210 | 260 |
| Continuing Value | | | | | 570 |

$$\begin{aligned}\text{Value of Asset} &= \frac{300}{1.1} + \frac{250}{1.1^2} + \frac{270}{1.1^3} + \frac{210}{1.1^4} + \frac{830}{1.1^5} \\ &= 1340.99\end{aligned}$$

Adjusted Present Value Method

APV model separates the value of operations into two components:

- the value of operations as if the company were entirely equity-financed
- the value of tax benefit arising from debt financing

$$\begin{array}{r} \text{Value of FCFs} \\ \text{Value of tax shield} \\ \text{Non-operating assets} \\ \text{Total enterprise value} \\ - \text{Value of Debt} \\ \hline \text{Equity Value} \end{array}$$

To compute value of FCF and tax shield use

$$k_u = WACC + k_b \frac{B}{B + S} T$$

where k_u = unlevered cost of equity

k_b = cost of debt

T = marginal tax rate on interest expense

B = market value of debt

S = market value of equity

APV yields same result as standard DCF method **IF** the WACC is adjusted for changing capital structure

Equity DCF Method

- Equity cash flow rather than FCF is used
- Discount rate = WACC

Disadvantage of Equity DCF Method:

Discounting equity cash flow provides less information about the sources of values creation.

The Equity DCF Method is primarily applied for financial institutions.

II.4 Economic Profit Method

Economic Value Added (EVA) =

$$\text{Invested Capital} \times (\text{ROIC} - \text{WACC})$$

where

ROIC = Rate of Return On Invested Capital
(Invested Capital =
Long-Term Assets + Working Capital)

Four Questions

1. What are Free Cash Flows?
2. How is ROIC defined?
3. How to estimate the Continuing Value?
4. What is WACC?

II.5 Free Cash Flow

$$\begin{array}{r} \text{Operating Profit (= EBIT)} \\ - \quad \text{Taxes on EBIT} \\ + \quad \text{Increase in deferred taxes} \\ \hline = \text{Net Operating Profit Less Adjusted taxes} \\ \quad (= \text{NOLPAT}) \\ + \quad \text{Depreciation} \\ - \quad \text{Increase in Working Capital} \\ - \quad \text{Capital Expenditures} \\ \hline = \quad \text{Free Cash Flow} \end{array}$$

where

$$\begin{array}{r} \text{Operating Cash} \\ + \quad \text{Accounts Receivable} \\ + \quad \text{Inventories} \\ - \quad \text{Accounts Payable} \\ - \quad \text{Net Accruals} \\ \hline = \quad \text{Working Capital} \end{array}$$

Forecasting Free Cash Flows

1. Forecast sales
2. Examine historical relationship between sales and other components of FCF
3. Check whether forecasts are reasonable
4. Consistency

II.6 Return On Invested Capital (ROIC)

$$\text{ROIC} = \frac{\text{NOPLAT}}{\text{Invested Capital}}$$

Growth Rate = ROIC x Investment Rate

where Investment Rate = $\frac{\text{Net Investment}}{\text{NOPLAT}}$

The key factors for economic growth of an enterprise are the ROIC and the growth rate!

Examples

Case 1: Investment Rate = 25%, ROIC = 10%,
Growth Rate = 2.5%, WACC = 10%

| Year | 0 | 1 | 2 | 3 | 4 | 5 |
|----------------|-----|--------|--------|--------|--------|--------|
| NOPLAT | 100 | 102.50 | 105.06 | 107.69 | 110.38 | 113.14 |
| Net Investment | 25 | 25.63 | 26.27 | 26.92 | 27.60 | 28.29 |
| Free Cash Flow | 75 | 76.88 | 78.80 | 80.77 | 82.79 | 84.86 |

PV of Free Cash Flow = 379.92

Case 2: Investment Rate = 0%, ROIC = 20%,
Growth Rate = 0%, WACC = 10%

| Year | 0 | 1 | 2 | 3 | 4 | 5 |
|----------------|-----|--------|--------|--------|--------|--------|
| NOPLAT | 100 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Net Investment | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Free Cash Flow | 100 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

PV of Free Cash Flow = 479.08

Examples Cont'd

Case 3: Investment Rate = 25%, ROIC = 0.00001%,
Growth Rate = 0%, WACC = 10%

| <u>Year</u> | <u>0</u> | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> |
|----------------|----------|----------|----------|----------|----------|----------|
| NOPLAT | 100 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Net Investment | 25 | 25.00 | 25.00 | 25.00 | 25.00 | 25.00 |
| Free Cash Flow | 75 | 75.00 | 75.00 | 75.00 | 75.00 | 75.00 |

PV of Free Cash Flow = 359.31

Crucial Comparison

- $ROIC > WACC$

firm is profitable – has competitive advantage

- $ROIC = WACC$

perfect competition

- $ROIC < WACC$

value destruction

Estimating Growth in Earnings

1. Look at the historical growth in earnings per share
2. Look at estimates of comparable firms
3. Look at fundamentals

II.7 Estimating Continuing Value

Three approaches:

1. FCF growth is constant after the forecast horizon
2. Convergence Approach
3. Terminal Value

II.7.1 FCF growth is constant after the forecast horizon

Typically additional assumption:
infinite life of the firm

Free Cash Flow grows at rate g

$$CV_T = \frac{FCF_{T+1}}{WACC - g}$$

where T is the end of the forecast horizon

Better:

$$CV_T = \frac{NOPLAT_{T+1} (1 - g/ROIC^*)}{WACC - g}$$

where $ROIC^*$ is long - term ROIC

Advantage: You don't need to estimate the Capital Expenditures!

II.7.2 Convergence Approach

Assumption: $ROIC^* = WACC$

In this case:

$$CV_T = \frac{NOPLAT_{T+1}}{WACC}$$

Hence, if growth doesn't create economic value, then the growth rate g does not matter.

II.7.3 Terminal Value

Terminal Value =
Book value of Invested Capital

Backward-looking method, but easy to use

Readings

- CKM chapters 8,9,11, and 12
- RWJ chapters 7 and 8
- Ross, *Uses, Abuses and Alternatives to the NPV Rule*, Course Packet