MGMT 310

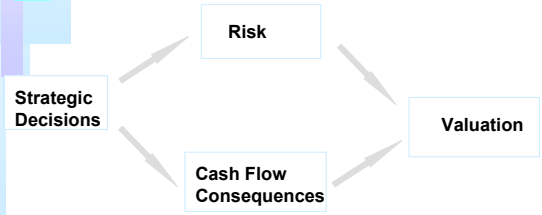
Company Valuation

Raghu Rau

Lecture Overview

- What determines the value of a company?
- Profit Maximization vs Value Maximization
- Valuation Methods
  - Comparable companies or earnings multiples methods
  - Discounted cash flow method
- Economic Value Added
- How do we calculate the terminal value?

Valuation Drivers: A Recapitulation



Value Maximization vs Profit Maximization

PROFIT MAXIMISATION	VALUE MAXIMISATION
influenced by accounting methods (depreciation, provisions)	cash based
backward looking-short term	forward looking-long term
no adjustment for risk	adjustment for risk

The Market Value Balance Sheet of the Company

Excess cash	Financial Debt
Marketable securities	
Operating Assets	Equity

Basic issue: What determines the value of a company's operating assets?

Valuation Methods

- **A. Comparable Companies or Earnings Multiple Method**
- **B. Discounted Cash-Flow Method**

Comparable companies or Earnings multiples method

- A common method of valuing assets involves the V/EBIT ratio. The method is simple, but fraught with difficulties in practice.

$$\frac{V}{EBIT} = \frac{\text{Market value of company}}{\text{Earnings before interest and tax}}$$

Comparable companies or Earnings multiples method

- An estimate of the market value of an asset is obtained from

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

where (V/EBIT)* is the value-to-earnings ratio of a "comparable" traded company (or average of a group of companies).

Good Thing about the V/EBIT Ratio

- Easy to calculate

Bad thing about the V/EBIT Ratio

- Earnings used to calculate V/EBIT are accounting figures. Why expect V/EBIT to be a meaningful economic quantity?

INTERNATIONAL COMPARISONS OF VALUATION MULTIPLES FOR NINE AUTOMOBILE COMPANIES, 1988

Country	Number of companies	Price/ earnings	Market/ book	Dividend yield
USA	3	4.8	.74	6.5%
Japan	1	17.2	1.90	0.8
England*	1	50.5	5.19	1.8
Sweden	1	10.4	2.33	3.0
Italy	1	5.5	1.21	2.1
W.Germany	2	19.9	2.23	2.0

* Reflects takeover bid for Jaguar by Ford

Other problems with the V/EBIT Approach

- Earnings are subject to short-term fluctuations. We are looking for a "steady-state" earnings figure. Earnings, therefore, have to be adjusted if they contain large extraordinary items.
- V/EBIT method assumes that all companies can generate the same growth.

Discounted Cash Flow

- *STEPS IN VALUATION*
- *1. Forecast free operating cash flows during forecast horizon.*
- *2. Estimate the cost of capital = discount rate = weighted average cost of capital.*
- *3. Estimate continuing value = value after forecast horizon = terminal value = residual value*
- *4. Discount to the present.*

EXAMPLE

Horizon : 5 years

TIME	0	1	2	3	4	5
FCF		200	200	200	200	200
Residual Value						500

$$\text{Value of asset} = \frac{200}{1.1} + \frac{200}{(1.1)^2} + \frac{200}{(1.1)^3} + \frac{200}{(1.1)^4} + \frac{700}{(1.1)^5} = 1068$$

Three Main Questions

- *1. What are free cash flows?*
- *2. How do we estimate residual value or terminal value?*
- *3. Where do we get the cost of capital?*

1. FREE CASH FLOW

EBIT (1 - T_c)

+ Depreciation

- Net capital expenditures

- Increase in *working capital requirements*

Free cash flow

WORKING CAPITAL REQUIREMENTS

· Investments necessary to operate the fixed assets. They consist of:

Operating cash

+ Accounts Receivables

+ Inventories

- Accounts payable

- Net accruals (*)

*** Net accurals = accrued liabilities - accrued assets**

Example

Balance sheet of American Rayon, Inc. at December 31, 1960 (thousands of dollars)

Cash	2,564	
U.S. government securities[a]	20,024	
Accounts receivable, net	11,863	
		34,351
Inventories		
Finished goods	4,376	
In process	2,161	
Raw materials and supplies	3,919	
		10,456
Prepaid expenses	283	
Current assets	45,190	
Property, plant and equipment, net		23,912
Other	125	
Total assets		$69,227

Liabilities

Accounts payable	**2,863**		
Accrued items	**1,145**		
Current liabilities		**4,008**	
Common stock	**26,959**		
Retained earnings	**38,260**		
Shareholders' equity		**65,219**	
Total liabilities and shareholders' equity			**$69,227**

How to forecast free cash flows?

- *Let us look at an example of valuation analysis made by a major investment bank.*
- *The forecasts start from forecasting sales.*
- *Next, historical relationships between sales and other components of free cash flow are introduced and used to forecast free cash flows.*

HISTORICAL FINANCING

	1993	1994	1995	1996	1997
Sales	100.0	105.0	112.0	120.0	128.0
Operating Profits	15.0	16.0	17.0	18.0	19.0
Income Taxes	5.0	5.5	6.0	6.5	7.0
EBIT(1-t_c)	10.0	10.5	11.0	11.5	12.0
Add : Depreciation	7.0	7.5	8.0	8.5	9.0
Less : Capital Expenditures	7.5	8.0	8.5	9.0	10.0
Change in WCR	5.0	2.0	0.0	3.0	0.0
Free Cash Flow	4.5	8.0	10.5	8.0	11.0

RELATIONSHIPS

	1993	1994	1995	1996	1997
Sales Growth	NA	5.0%	6.7%	7.1%	8.7%
Operating Profit Margin	15.0%	15.2%	15.2%	15.0%	14.8%
Tax Rate	33.3%	34.4%	35.3%	36.1%	36.0%
Net Income Margin	10.0%	10.0%	9.8%	9.6%	9.4%
Deprec. at a % of Sales	7.0%	7.1%	7.1%	7.1%	7.0%
Cap. Exp. as a % of Sales	7.5%	7.6%	7.6%	7.8%	7.8%
Working Investment	35.0	37.0	37.0	40.0	40.0
WI as a % of Sales	35.0%	35.2%	33.0%	33.3%	31.3%
Net property, plant & equip.	75.0	75.5	76.0	76.5	77.5
Change in Sales/Change in PPLE	NA	10.0	14.0	16.0	8.0
Operating Cash Flow	22.0	23.5	25.0	26.5	28.0
OCF as a % of Sales	22.0%	22.4%	22.5%	22.1%	21.9%

PROJECTED RELATIONSHIPS

	1998	1999	2000	2001	2002
Sales Growth	7.0%	7.0%	7.0%	7.0%	7.0%
Operating Profit Margin	15.0%	15.0%	15.0%	15.0%	15.0%
Tax Rate	36.0%	36.0%	36.0%	36.0%	36.0%
Net Income Margin	9.6%	9.6%	9.6%	9.6%	9.6%
Deprec. at a % of Sales	7.0%	7.0%	7.0%	7.0%	7.0%
Cap. Exp. as a % of Sales	8.0%	8.0%	8.0%	8.0%	8.0%
Working Investment	45.7	48.8	52.3	55.9	59.8
WI as a % of Sales	33.3%	33.3%	33.3%	33.3%	33.3%
Net property, plant & equip.	78.9	80.3	81.9	83.6	85.4
Change in Sales/Change in PPLE	6.5	6.5	6.5	6.5	6.5
Operating Cash Flow	30.1	32.2	34.5	36.9	39.5
OCF as a % of Sales	22.0%	22.0%	22.0%	22.0%	22.0%

PROJECTED FINANCIAL RESULTS

	1998	1999	2000	2001	2002
Sales	137.0	146.5	158.8	167.8	179.5
Operating Profits	20.5	22.0	23.5	25.2	26.9
Income Taxes	7.4	7.9	8.5	9.1	9.7
EBIT(1-t_c)	13.1	14.1	15.1	16.1	17.2
Add : Depreciation	9.6	10.3	11.0	11.7	12.6
Less : Capital Expenditures	11.0	11.7	12.5	13.4	14.4
Change in WCR	5.7	3.2	3.4	3.7	3.9
Free Cash Flow	6.1	9.4	10.1	10.8	11.5

Residual or Continuing Value Estimation

- **If we assume that after the forecast horizon free cash flows grow at a constant rate, g, forever, then it can be shown that the residual value is equal to**

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

  - **where WACC = cost of capital**
  - **T = end of forecast horizon**
  - **CV_T = residual value at time T**
  - **g = growth rate in FCF, assumed to be constant**
- **A reasonable assumption is to assume that g is equal to the inflation rate.**

Summary

- *The best way to calculate the value of a company is to use the DCF method*
- *The DCF method involves computing the free or operating cash flows of the company, finding the present value of these cash flows, and adding up all these present values to get the value of the company.*

Summary

Free cash flows are given by the formula:

EBIT (1 - T_C)
+ Depreciation
- Net capital expenditures
- Increase in working capital requirements
= FCF

What do I need to know for the exam?

- *How to compute the free cash flows of a company*
  - *Do I know what the components are?*
  - *Can I use them when calculating FCF?*
  - *How do I account for terminal cash flows?*
  - *What is RORIC?*
  - *What is EVA?*

What do I need to do for next time?

- *Answer web question*
- *Bring case "MRC (Inc)" to class*
- *Read case beforehand*
- *Download questions on case from website and see if you can answer them*
- *If you haven't read the case and you are called upon in class, you will be penalized!*