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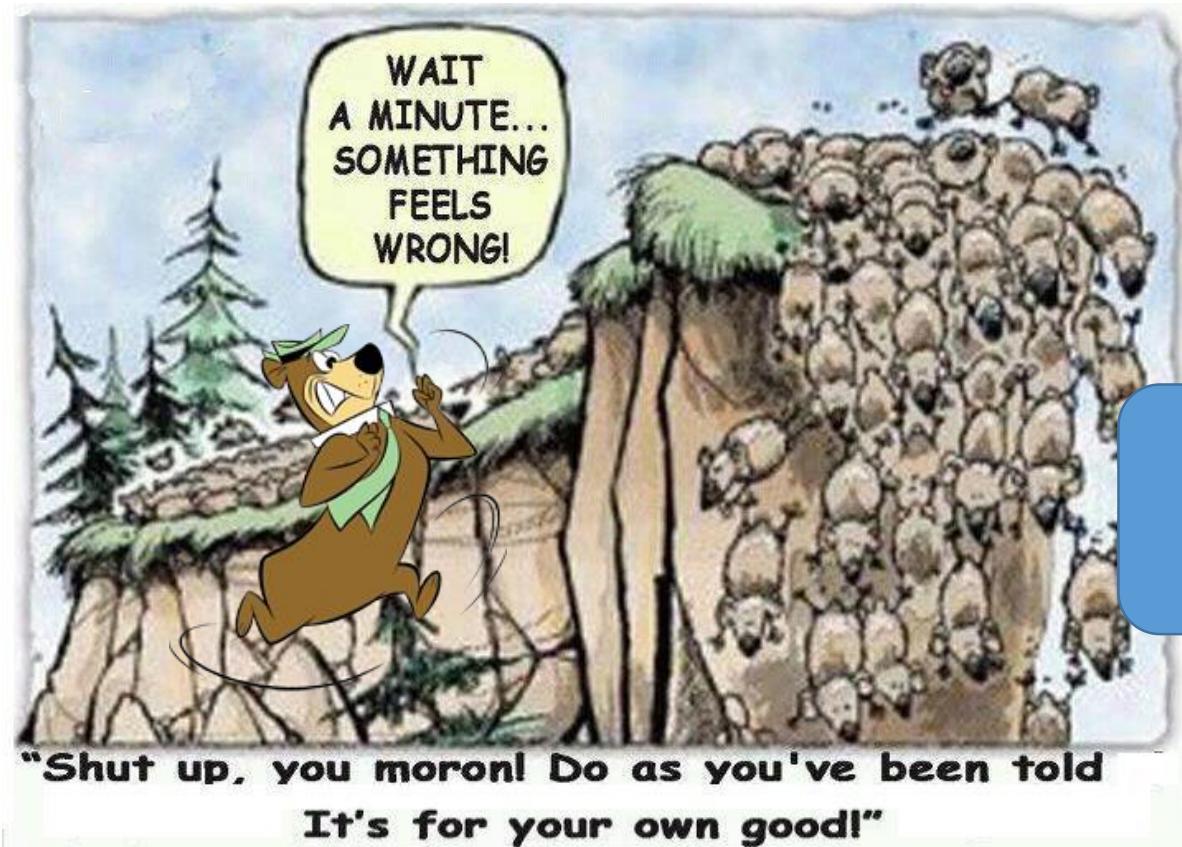
Valuation and Investments

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Lemming story



Objective

- Valuation of a firm?
- Why valuation?
- Methods of valuation
- Choices of these methods
- Assignment

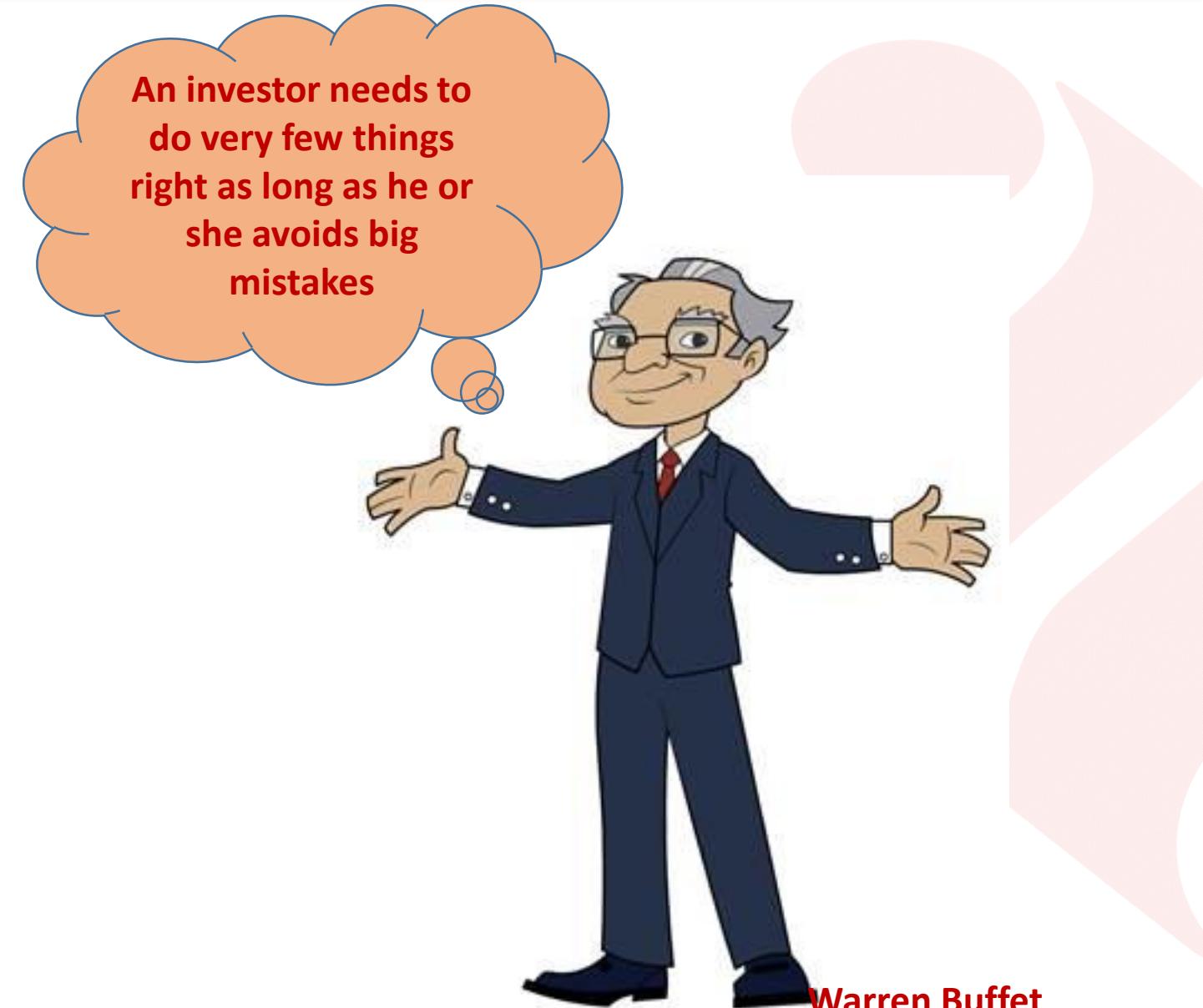
Valuation

A venture's value today is determined by all future cash flows discounted at an appropriate investor rate of return.

The valuation rule is the algorithm by which an investor such as an angel or venture capitalist assigns a monetary value to a new venture.

Reasons for valuing companies?

- Spin-offs
- Divestitures
- Mergers
- Initial Public Offer
- Employee stocks
- Company investments
- Shareholder conflicts
- Tax
- Accounting



Warren Buffet

Difference in Perception

- Investor and Entrepreneur has a difference of perception of Valuation
 - Uncertainty of projected outcomes
 - Asymmetric information
 - Assigning a value to IPR and intangibles
 - Dynamics of Industry and Financial market place
 - Focused Vs Diversified approach for investments

Return on Investment

| Ranking by Sector | Sectors | ROI |
|-------------------|------------------------|---------|
| 1 | Retail | 14.58 % |
| 2 | Technology | 14.00 % |
| 3 | Consumer Non Cyclical | 13.06 % |
| 4 | Transportation | 11.44 % |
| 5 | Consumer Discretionary | 10.84 % |
| 6 | Healthcare | 8.69 % |
| 7 | Capital Goods | 8.09 % |
| 8 | Services | 7.20 % |
| 9 | Conglomerates | 5.13 % |
| 10 | Basic Materials | 4.10 % |



"I would've preferred everything I touched turned to OIL."

Why venture valuation is difficult?

- No track record
- Valuation more dependent on qualitative factors
- Uncertainty is higher (team, market, and technology)
- Potential rewards higher
- Exit and liquidity are more important
- Growth
- Not just a go/no-go decision; the actual valuations matter

Valuation Methods

- Asset approach
 - Book Value, Adjusted Book Value, and Liquidation Value
- Market approach
 - Price to Earnings, Price to Revenue, Price to Book Value, and Industry Comparable
- Income approach
 - NPV, VC method, and Discounted Future Earnings

Book Value: Firm (Enterprise) Value = Book Value of Assets

- **Most widely used and perhaps the most flawed**
- Based on **historic numbers**
- Based on accounting numbers
- **Ignores intangibles** like customer loyalty
- **Ignores risk**

Value: Book Value

Accounting Balance Sheet

| | | | |
|--|--------|------------------------|--------|
| Fixed assets | \$1500 | Current liabilities | |
| Current assets | | Short-term debt | \$150 |
| Cash | \$200 | Payable | \$320 |
| Marketable securities & financial investments | \$150 | Accrued expenses | \$80 |
| Inventory | \$350 | Noncurrent liabilities | |
| Receivable | \$400 | Long-term debt | \$1000 |
| | | Equity | \$1050 |
| | \$2600 | | \$2600 |

Comparable Companies

- Simple but with many potential pitfalls.

$$V/EBIT = \frac{\text{Market Value of Company}}{\text{Earnings Before Interest and Taxes}}$$

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

Pros and Cons of V/EBIT

Advantages

- Easy.
- Makes intuitive sense.
- If your comparable are really comparable then it should work.

Disadvantages

- Earnings used to calculate V/EBIT are accounting figures.
- Earnings are subject to short-term fluctuations.
- V/EBIT assumes all companies will generate the same growth.

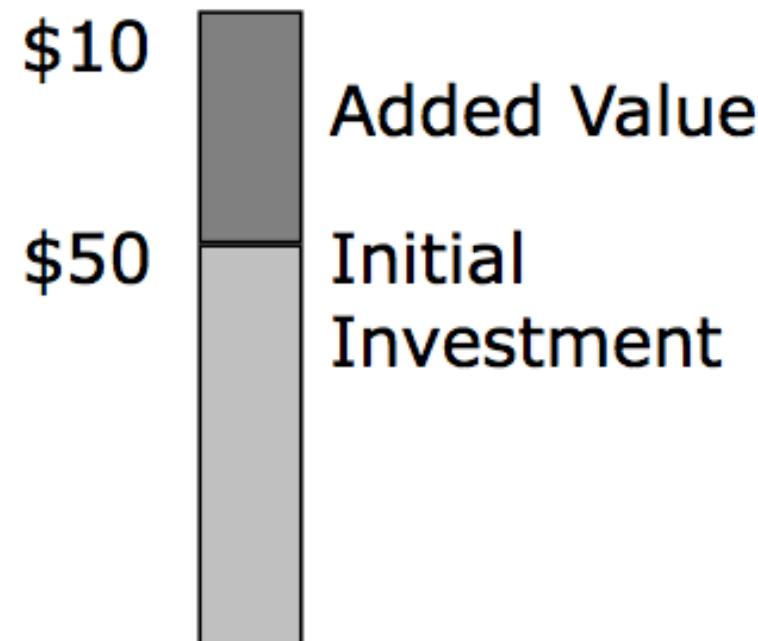
Other Widely Used Multiples

- Price-to-Earnings
- Price-to-Sales
 - Popular for firms with negative earnings
- Market-to-Book value
 - Also popular for firms with negative earnings
- Asset Value-to-EBIT
- Asset Value-to-Revenues
 - Also popular for firms with negative earnings

Income Approach

Suppose we can invest \$50 today & receive \$60 later today. What is our increase in value?

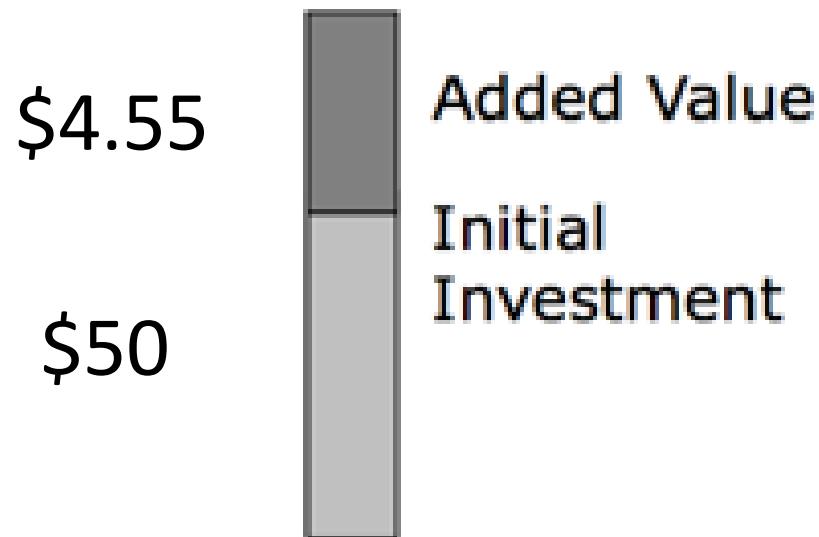
$$A: \text{Profit} = - \$50 + \$60 =$$



Income Approach

Suppose we can invest \$50 today and receive \$60 in one year. What is our increase in value given 10% required return (risk return relations!)?

$$Profit = -\$50 + \frac{\$60}{1.1} = \$4.55$$



Income Approach: NPV

- What is present assets (PV) worth tomorrow (future value)?
- What is future assets (FV) worth today (present value)?

$$FV = PV * (1 + r)^t$$

$$PV = \frac{FV}{(1 + r)^t}$$

Income Approach: NPV

Assumption: *Value = NPV*

Assets are estimated based on Cash flows, growth and risks

NPV: Information needed

- Estimate the life of the asset
- Estimate the cash flows during the life of the asset
- Estimate the discount rate to get the present value

$$NPV = C_0 + \frac{C_1}{1+r} + \frac{C_2}{(1+r)^2} + \cdots + \frac{C_t}{(1+r)^t}$$

Terminology

C = Cash Flow

t = time period for investment

r = discount rate

- Benefits
 - Considers all cash flows
 - Recognizes time value of money
 - Accepting only positive NPV projects, increases value of the firm
- Drawbacks
 - Requires detailed long-term forecast of cash flows

Asset-Based Valuation versus Net Present Value Approaches

Company to be valued

Airline in financial distress

Valuation approaches

Present value models

Asset-based valuation

Valuation inputs

Airline stopped the dividend and is losing money and “burning” cash

Routes, flight agreements, equipment, and aircraft have value

Advantages and Disadvantages

Present value models

- Theoretically appealing and provide a direct computation of intrinsic value
- Input uncertainty can lead to poor estimates of value

Multiplier models

- Ratios are easy to compute and analysis is easily understood
- Problems with selecting a peer group or “comps”

Asset-based valuation

- Consistent with the notion that a business is worth the sum of its parts
- Difficulties determining market value and the value of intangible assets

Valuation: E-Kart

E-Kart wants to attract an excellent salesperson in exchange for stocks. At a trade fair, the owners of E-Kart met Sahil Gupta. Sahil is quite a good salesmen and willing to let E-Kart pay his first year salary in stocks. In a comparable function at an other company, Sahil could make ₹80000 a month. The expected free cash flows of E-Kart in the future are as summarized below. Since the venture faces much uncertainty Sahil requires a return on his money of 35%. Using the NPV approach, how big should the stake in the venture be that Sahil gets in order to cover his salary in the first year?

| Year | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------------------|-------|---------|---------|--------|---------|---------|---------|---------|---------|
| Cash Flow (in Lakhs) | ₹0.00 | -₹10.00 | -₹50.00 | ₹50.00 | ₹100.00 | ₹150.00 | ₹175.00 | ₹185.00 | ₹190.00 |

- Step 1: Forecast free cash flows
- Step 2: Choose a discount rate (VC discount rate)
- Step 3: Discount FCF to determine company value
- Step 4: Determine Sahil's stake in the company

NPV Example E-Kart

| Year | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------------------|--------|-------------------|----------|---------|---------|---------|---------|---------|---------|
| Cash Flow (in Lakhs) | ₹0.00 | -₹10.00 | -₹50.00 | ₹50.00 | ₹100.00 | ₹150.00 | ₹175.00 | ₹185.00 | ₹190.00 |
| PV Cash | ₹0.00 | -₹7.41 | -₹27.43 | ₹ 20.32 | ₹ 30.11 | ₹ 33.45 | ₹ 28.91 | ₹ 22.64 | ₹ 17.22 |
| Discount rate | 35.00% | Net Present Value | ₹ 117.81 | | | | | | |
| | | Salary | ₹9.60 | | | | | | |
| | | Stake | 8.15% | | | | | | |

References and Lab Exercise

- Belleflamme, P., Lambert, T., & Schwienbacher, A. 2014. Crowdfunding: Tapping the right crowd. *Journal of Business Venturing*, 29(5): 585-609.
- [Consultancy firm in IT-software](#)
- [Blank Case File](#)