Valuation

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First Principles

- Value is a function of cash, time and risk
- Both cash and risk may be managed
  - Selection of opportunity & strategy
  - Management and their incentives
  - Contractual terms
- Challenge of valuation: incomplete information
  - Costly and difficult to acquire
  - Players have different information

Techniques

- Discounted cash flow
- Scenario analysis (multi DCF)
- Multistage analysis (decision tree or real options analysis)
- "Venture Capital" method

Venture Capital Method

Steps:

1. Forecast future results ("success")
2. Determine likely value at that point (e.g. P/E ratio for comparable)
3. Determine likely dilution from: (a) capital and (b) employee stock
4. Determine share of value "pie" demanded given required rates of return
5. Convert future values to present to derive share prices, ownership percentages

Step 1: Forecast Results

- What's a reasonable forecast?
- Upside case--what can go right?
- Over what period of time?

Step 2: Future Value

- What's comparable?
  - Markets
  - Growth rates
  - Business model
  - Asset intensity
  - Cash flow characteristic
- Metrics
  - P/E ratio
  - Price-per-subscriber
  - Price-to-sales
  - Price-to-cash-flow
  - Cap rate

Step 3: Dilution

- How much capital? When?
- New shares for employees? When?
- Other potential issuances of stock (e.g. acquisition)

Step 4: Value "Pie"

- Required rate of return for investors, dependent on:
  - Risk free rate
  - Premium for market risk
  - Premium for illiquidity
  - Premium for value-added (compensation)
- Estimate using past experience (apply "fudge factor")

VC Discount Rates

- Seed stage: 80% +
- Startup: 50-70%
- First-Stage: 40-60%
- Second-Stage: 30-50%
- Bridge/Mezzanine: 20-35%
- Public Expectations: 15-25%

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Step 6: THINK!

- Consider other factors affecting price
- Competitive pressure in deal
- Buyer: possible synergies
- Seller: forgoing control

- Is this (generally) realistic?
- Use estimates to make plan
- Signal capabilities to investors, customers, etc.

- Does it make sense ???

Common Patterns

- Achieve plan, but two years later
- Achieve plan, but requires twice as much money
- More shares required for management
- Lower margins due to competition
- Exit windows

Typical VC Questions

- What if we use a different discount rate?
- What if terminal value is different?
- What if performance varies from plan? (timing? magnitude and financial need?)
- What if more shares are issued for management or other reasons?
- What if we're confronted with a different asking valuation or share price?

Different Questions

- What are the logical implications of a given value level
  - What level of net income is required in year 5 for investor to receive target return?
  - What level of sales is required?
- Questions re:
  - industry structure
  - sustainability
  - exit multiples and options

When to Use What?

- How good are forecasts?
- How good are comparables?
- Highly risky investments/no substantive operating results for significant periods of time: VC METHOD
- Less explosive growth/predictable flows: DCF

- Part ART
- Part SCIENCE!

Also Remember...

- Venture capitalists don't get rich by cutting tough deals
- Entrepreneurs don't get rich by taking highest offers
- Don't miss the forest for the trees! (sensitivity analysis)

Equity Concepts

Capitalization ("Cap Tables")

- Common shares
- Employee stock options (option pool)
- Preferred shares (various series)
- Warrants (on common or preferred)

Cap Table Example

Capitalization Structure

Premoney Valuation		$6.5	$35.0	$100.0	
Invested Capital		$6.5	$8.5	$9.0	
Postmoney Valuation		$13.0	$43.5	$109.0	$450.0
	Post Financing Ownership Levels				
Stakeholders	**Founding**	**Series A**	**Series B**	**Series C**	**Exit**
Founders	100.0%	35.0%	27.0%	24.3%	19.5%
Employees		15.0%	15.0%	15.0%	12.0%
Series A Preferred		50.0%	38.5%	34.8%	27.8%
Series B Preferred			19.5%	17.6%	14.1%
Series C Preferred				8.3%	6.6%
Public Market					20.0%
Total Ownership	100.0%	100.0%	100.0%	100.0%	100.0%

Projected Investor Return

	Series A	Series B	Series C	Total
Years until Exit	5	4	3	
Invested Capital	$6.5	$8.5	$9.0	$24.0
Invested Capital Value upon Exit	$125.2	$63.5	$29.7	$218.4
IRR	80.7%	65.3%	48.9%	72.1%

Important Concepts

- What constitutes company ownership?
- How does ownership change over time?
- Roles of Company Board
- Authorized vs issued / granted vs vested
- Authorizing new series of preferred
- "Printing stock" (new stock) for employees

- "Fully diluted" ownership
- "Treasury method" for share accounting
- Stock option expensing debate
- Vested vs unvested stock (restricted stock)

Equity Compensation

Employee Stock Pools

- Stock options (ISOs & NSOs) vs common stock
- "4 yr vesting with 1 yr cliff"
- What's enough?
- Stock grants per year (public co)
- Stock grants per year (startups)

Ranges of Grants

Position	Pre-Rev	Post-Rev
CEO	5-10%	3-8%
VP Engineering	3-5%	1-3%
VP Marketing	3-5%	1-3%
VP Sales	1-2%	1%
CFO	2-3%	1-2%
Other VPs	1-2%	1%
Key Individuals	0.5-2%	0.3-1%

Stock Comp Philosophy

- Skew to key performers
- Egalitarian
- Replacement cost
- Vesting policies
- "Outsider" stock holdings

Team Formation
Team Assignments

Homework Review