Lecture Summary on Venture Capital Financing

Questions addressed:

I. Why do entrepreneurs obtain equity funding from VCs? Why not use other sources of funding?

II. How are VC-Backed firm valued, funded, and capitalized?

III. Why do VCs often provide staged-financing?

IV. Why do VCs take preferred stock or a combination of preferred and common stock? How do the payoff structures of alternative securities held by VCs look like? What kind of incentive schemes do these payoff structures create?

V. How do VCs protect themselves from entrepreneurs' wealth expropriation? How are control rights allocated at VC-backed companies?

VI. What are the most common exit strategies for VC-backed firms?

I. Why do entrepreneurs obtain equity funding from VCs? Why not use other sources of funding?

Enterpreneurs' objectives:

1) Find funding to make the project possible

2) Need outside expertise and contacts to make their projects successful (so firms try to choose the most reputable VCs that can:

- bring a network of lawyers, investment bankers, consultants;
- find and recruit experienced managers;
- use their experience to find new market opportunities;
- monitor the progress of the firm;
- certfiy the quality of the firm;
- bring in new key investors.

3) They trade off the benefit of maintaining the control of the project against diversifying personal wealth

VCs' objectives:

1) Invest in projects with good return potential

2) Maintain abandonment option to minimize downside risk and mitigate opportunitistic behavior from entrepreneurs.

3) Build reputation by successfully bringing firms public

Alternative funding sources for VCs:

1) *Bootstrap* (owner equity) – insufficient when the firm grows above a certain threshold

2) *Angel investors* (wealthy individuals) – limited due dilligence, less thorough in their negotiations since reputational concerns are less important, don't actively monitor their investments

3) *Banks* – Reluctant to lend to firms that burn cash and offer little or no collateral. Also, enterpreneurial firms value flexibility and thus are not very fond of bank loan covenants.

4) *Corporations* – a way for corporations to beat their competitors

II. How are VC-Backed firm valued, funded, and capitalized?

Valuation is important to the original enterpreneur for two reasons:

1) Dilution (% relinquished to raise a given some of money)

2) Control (higher equity stake means more control)

Valuation techniques:

1) Implied valuation

Example: Suppose firm A has 900,000 shares outstanding. A VC approaches the firm and offers $1,000,000 for 10% ownership stake. This implies the following:

Post-money valuation = $1,000,000 / 10% = $10,000,000

Pre-money valuation = $10,000,000 - $1,000,000 = $9,000,000

2) Bottom up valuation

How do venture capitalists decide how much to bid?

Suppose the VC in the above examples predict that firm A will earn $5 million 6-years from today and they believe that firms in A's industry will be priced at P/E = 30. If the VC wants 10% of A and has a required rate of return of 40% they should pay:

Bid = 10% * 30 * $5,000,000 / $(1.4)^6$ = $15,500,000

Complications

1) The above examples are based on the assumption that there are no stock options that dilute the ownership of original equityholders.

Example: Suppose firm XYZ has 2 original owners each with 1,000 shares. At some point over the life of the firm, the owners decide to issue stock options to their employees backed by 500 new shares. This lowers to ownership fraction of each of the owners from 50% to 40%, or in other words dilutes their ownership stake by 10%.

2) Investor preferences:

Preferred and common stock owners' cash flow rights are not exactly proportional to their equity proportion because of dividend distribution and seniority differences upon liquidation.

Capitalization Table for VC Investments

	Initial capitalization					First round investment					Second round investment			
	# of shares	$ per share	Total $MM Invest.	% Owned		# of shares	$ per share	Total $MM Invest.	% Owned		# of shares	$ per share	Total $MM Invest.	% Owned
Founders	2M	0.01	0.02	100%		2M			66.7%		2M			44.4%
Fund A						1M	1.00	1.00	33.3%		1M			22.2%
Fund B											1.5M	2.5	3.75	33.3%
Total	2M		0.02	100%		3M			100%		4.5M			100%

III. Staged financing

VCs fund companies in multiple rounds:

1. Seed stage
2. Start-up stage
3. Early stage
4. Expansion

Why staged funding?

1) Asymmetric information between the enterpreneur and the VC decreases over time and the VC can make more informed decision.

2) Receiving contingent funding and on-going VC monitoring disciplines the enterpreneur and reduces moral hazard problems.

3) If the VC receives a negative signal about firm quality or detects wrong-doing by the enterpreneur in-between funding stages, it can use the "option to abandon".

Example: ABC.com needs $10 million to get things off the ground and later $20 million/year for business development. Suppose next year firm's prospects will have come out:
GOOD scenario: 2/3 probability - certain payoff of $150 million
BAD scenario: 1/3 probability – 1/10 chance of success and $150 million and 9/10 chance of $0

If bad news come out, efficient not to invest $20 > expected payoff. If you give all the money up-front the enterpreneur will waste it.

IV. Security Design in VC-Backed Firms

Securities held by the enterpreneur:

The enterpreneur typically holds common stocks. However, to align the incentives of the enterpreneur with the interests of the VC some provisions are included in the agreement:

1) "Earn-ins" that allow the enterpreneur growth its equity stake by meeting performance goals. E.g., stock options, stock grants.

2) "Vesting interest": Stock options or grants cannot be exercised for a period of time (e.g., for 5 years or until FDA approval of the firm's key product etc.) – Helps retain key employees and encourages them to work hard.

3) The enterpreneur forfeits a portion of its equity if his cash flow projections turn out to be overly optimistic:

a) Gives the enterpreneur the incentive to be truthful about the firm's prospects
b) VCs can transfer equity to new managers without dilution of their own shares.

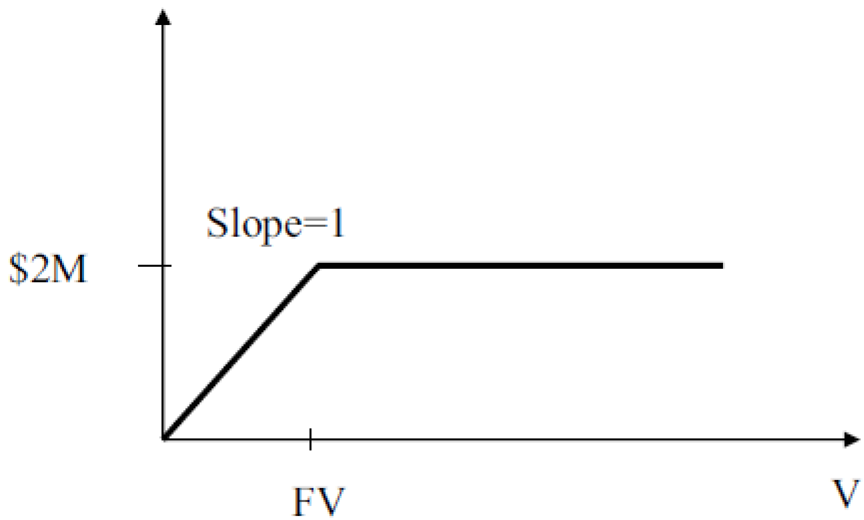
Securities held by the VC:

VCs typically receive redeemable convertible/straight preferred stocks (sometimes packaged with common stock) for investing in the firm

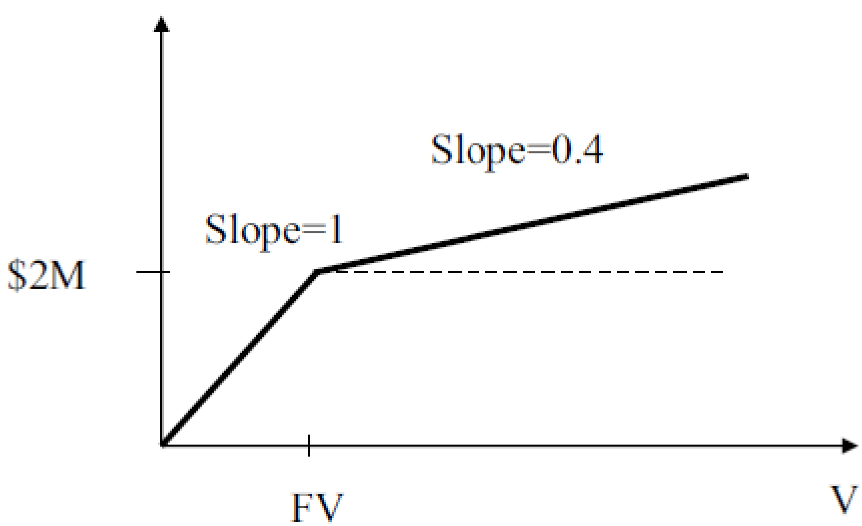
- Upon liquidation, VC's preferred stock is senior to enterpreneur's common stock
    - Prevents the *take-the-money-and-run* problem: Prevents the enterpreneur from pulling out money before creating any economic value
- Redemption period is either 5 or 8 years from original investment or an IPO or a sellout.
- By allowing the VC to gain greater cash flow and control rights if the enterpreneur does not redeem, VC contracts force a liquidity event when redemption is mandatory ("put rights").

Now, let's examine the payoff of three types of securities held by VCs:

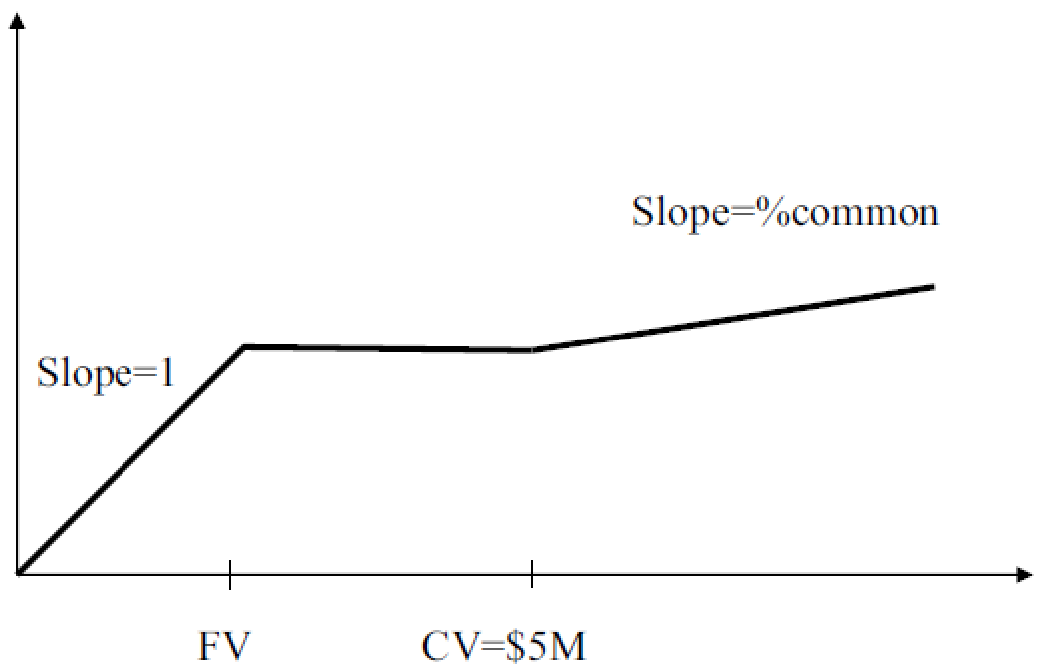
a) Preferred stock with \$2 million FV (dividends accrue but are typically not paid before redemption, which distinguished this security from debt)



b) Preferred stock with \$2 million FV packaged with 40% common stock ownership



c) Suppose the VC invests $2 million in the firm and obtains convertible preferred shares with conversion price of $5/share. Therefore, preferred shares are convertible into 400,000 common stocks. Suppose the firm already has 600,000 common shares outstanding. Thus, if conversion occurs the VC will have 40% stock ownership rights. The VC will only convert if firm value exceeds $5 million.



V. Protecting VCs from Wealth Exproporiation

1) The funding agreement between the VC and the enterpreneur includes *anti-dilution provisions*. The idea is if the enterpreneur raises external equity in later rounds at a price below the VC's price, then the conversion price of the VC is reduced to avoid dilution:

- Prevents the enterpreneur from expropriating the VC by a washout financing
- Helps VCs maintain a constant fraction of equity and control
- Pushes the downside risk of the firm on the enterpreneur and gives him incentives to increase payoffs.

a) Full-rachet anti-dilution: The conversion price is reduced to the price of new financing

b) Weighted-average anti-dilution: The new conversion price takes into account the number of shares issued

- New conversion price = [(A+C)/(A+D)] * Old conversion price, where
  - A: # of shares before the transaction
  - C: # of shares to be issued if the old conversion price had held
  - D: # of shares actually issued under the new conversion price
- New shares to initial investors = (Old price/New price)*Initial shares owned

Example: Company has 2 million shares outstanding (1 million common stock of owners, and 1 million convertible preferred stock of VC at conversion price $1). The firm issues 50,000 shares at $0.5/share.

a) Full-rachet: The new conversion price is $0.5/share. VC gets 2 million shares or slightly less than two-thirds of equity ownership.

b) Weighted-average rachet:
New conversion price = [(2,000,000+25,000)/(2,000,000+50,000)] * $1 = 0.988
Preferred stockholders get 1,012,145 shares or 49.08% of equity.

- One way to avoid the dilution problem is to conduct rights offering.

2) Allocation of *control rights* to maximize performance

Because of the way securities are designed and cash flows are shares, enterpreneurs have incentives to increase business risk (as they share more of the upside).

a) Voting rights:

VC (57%); Enterpreneurs (23%); Neither (20%)

*** If performance or vesting targets are not met, VC increases control 72% of the cases.

b) Board representation:

The average number of board members is 5. VCs get 41.5% of the boards seats, enterpreneurs get 34.7%; and the remainder is held by outsiders.

c) Protective provisions:

- "Supermajority rights": Approval of preferred shareholders are required for:
  - Sales, mergers, or liquidations
  - Changes in corporate charters
  - Major acquisitions or board changes
  - Appointment or termination of CEO
- Covenants that shift control from the enterpreneur to the VC.

VI. What are the most common exit strategies for VC-backed firms?

Most VC-backed firms fail before they see the light of the day. Therefore, VC investments are very risky. However, VCs constantly search for the next Microsoft, Apple, Google, or Intel whose VC funds made enough money to offset losses from hundreds of failed deals. For example, in 1978 and 1979, VCs invested $3.5 million for 19% of Apple Computer. After Apple's $1.4 billion IPO in December 1980, the VCs stake was worth $271 million (a more than 7000% return).

Most successful VC-backed firms eventually become publicly listed with an IPO. Depending on market conditions, the VC may prefer to sell its stake in the M&A market. Not surprisingly, in countries will relatively less developed equity and IPO markets the VC industry failed to flourish.