Venture Capital Contracts: Part I

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What Do Entrepreneurs Care About?

- Build a successful business
- Raise enough money to fund the venture
- Maintain as much value and control of the company as possible
- Get expertise and contacts to grow the company
- Share some of the risks with investors
- Financial returns from the venture
What Do Venture Capitalists Care About?

- Maximize financial returns
- Ensure that portfolio firms make sound investment/management decisions
- Participation in later financing rounds if the venture is a success
- Eventually achieve liquidity, i.e. sell the firm in IPO or merger
- Build own reputation
Both Care About:

- The success of the new venture
- The split of financial returns
- The allocation of control rights
- Eventually liquidating some or all of their stake in the company

Potential conflicts of interest??
Logic behind the Contracts

• **Financial returns** are divided to
  → Reward investors for their investments in the firm
  → Provide high-powered incentives to entrepreneurs to maximize value and to stay with the firm
  → Provide VCs with incentives to add value
    → Contrast with incentives in firms

• **Dynamic allocation of control:**
  → Gives more control to entrepreneur if things turn out well
  → Gives more control to VC if things do not turn out well

• **Provide incentives to achieve a liquidity event**
Do Simple Financial Instruments Meet the Needs of VCs and Entrepreneurs?

• Common stock
  → Returns?
  → Control?
  → Liquidity?

• Debt
  → Returns?
  → Control?
  → Liquidity?
Key Terms of VC Contracts

• Preferred Stock
  → Redeemable (or straight) preferred
  → Redeemable preferred packaged with common stock
  → Convertible preferred
  → Participating convertible preferred

• Anti-Dilution Provisions
  → Full Ratchet
  → Weighted Average Anti-Dilution

• Covenants/ Control Terms

• Employee Terms
Key Features of all Preferred Stock Used in Venture Capital

• Liquidation Preference over Common Stock

• Redemption Rights
Liquidation Preference over Common Stock

- Prevents the “Take-the-Money-and-Run” Problem
  → Prevents founders from being able to pull out money before they create any real value
- Tax Deferral
  → Redemption of preferred is just return of capital, thus no capital gains tax
- Favorable Pricing of Common Stock
  → IRS will accept low common-stock valuations and thus will not put heavy tax burden on employees/founder with common stock.
Redemption

• Mandatory redemption right allows VC to “put” the preferred stock back to the company
  → Force liquidity event
  → Prevent “life-style company”
  → Specified in > 90% of VC deals
• Redeemable preferred stock always specifies when it must be redeemed by company
  → Typically the sooner of IPO or 5 to 8 years: company has to pay cash to redeem preferred at original price or “fair market value”
• If company cannot redeem, then penalties can kick in:
  → Reduction in conversion price or increased board seats for VC
Redeemable Preferred/ Straight Preferred

- No convertibility into common stock
- Dividends accrue (i.e. are added to the face value) but aren’t typically paid prior to redemption
- Example: Preferred of $2M

V: Liquidation Value
FV: Face Value of Preferred
Preferred Packaged with Common Stock

- Downside protection and upside potential
- Example: Preferred of $2M + common stock for 40% of the company

![Graph showing preferred stock packaging with common stock.]

V: Liquidation Value
FV: Face Value of Preferred

Graph:
- Slope = 1 up to $2M
- Slope = 0.4 above $2M
- V: Liquidation Value
- FV: Face Value of Preferred
Convertible Preferred

- Can be converted at the shareholders’ option into common stock at a pre-specified conversion price
- Convert if total value at IPO/sale/liquidation is greater than the liquidation preference (with accrued dividends).
- Most contracts include automatic/mandatory conversion at IPO provided the IPO price and proceeds are high enough
Convertible Terms

• **Conversion option:**
  → If initial investment is $2,000,000 and conversion price is $5/sh, then can convert into 400,000 shares. If there are initially 600,000 common shares outstanding, then own 40% of the common stock on conversion.
  → In this case, will convert if $4V > $2M or V > $5M (ignoring accrued dividends).

• **Automatic Conversion**
  → VC must convert at an IPO provided the IPO price is greater than some multiple of the initial conversion price.
  → The median multiple is 3.0; it is higher for early stage deals (4.0); lower for later stage deals (2.7)
Payoffs from Convertible Preferred

FV: Face value of preferred stock
CV: Min. enterprise value at conversion

Slope=1
Slope=%common

FV
CV=$5M
Participating Convertible Preferred

- Convertible preferred with extra feature that “in the event of liquidation or sale” the holder gets face value plus equity participation.
  → Redeemable preferred + common stock if the company is liquidated (including private sale but not IPO). In our example, would get $2M and 40% of the company.
  → Convertible preferred if company goes public. In our example, would get $2M or or 40% of the company.
  → In this case, convert if \(0.4 \times V_{IPO} > $2M + 0.4 \times (V_{SALE} - $2M)\) (ignoring accrued dividends).
Payoffs from Participating Preferred

FV of preferred

Slope=1

Slope= % common

SALE

IPO

FV: Face value of preferred stock
Payoffs from Participating Preferred (Assume a Maximum Sales Price)
Evolution of Preferred Stock Over Time

• **1970s**: Security of choice - Redeemable preferred
  → Often in combination with common stock
  → Not many IPOs

• **1980s**: Security of choice - Convertible preferred
  → Active IPO market
  → Large increase of funds flowing into VC industry

• **1990s**: Security of choice - Participating convertible preferred
  → Many later stage investors paid very high prices
Do these Pay-off Structures Matter?

- No, in the world of Modigliani-Miller!
  → Just alternative ways of slicing up the pay

- Yes, in the real world
  → High-powered incentives for VCs to add value
  → High-powered incentives for entrepreneurs create long-term value
The Role of Preferred Stock

• Preferred feature aligns incentives of entrepreneur with VC to strive for large payoffs
  → Limits returns to the founder for modest outcomes - incentives to reach high payoffs

• The extent to which the VC wants to encourage the entrepreneur to go for the big payoffs can be controlled by specific choice of security. Redeemable Preferred + Common Stock > Participating Convertible Preferred > Convertible Preferred > Common Stock > Minimum wage
Relation of Deal Structure and Implied Firm Value: Convertible Preferred

• VCs typically derive the “post-money” ("pre-money") value of a firm based on the terms of the convertible preferred contract.
  → If, for example, the VC invests $2M in the above convertible preferred contract (which converts into 40% of the firm’s common stock), then VC will say that the post-money value is $2M/.4 = $5M and the pre-money value is $3M ($5M - $2M)
  → Alternatively, if the VC method comes up with a value of $5M post-money, and the investment is $2M, then the VC method chooses a % ownership, s, such that s*$5M = $2M. Here s is 40%.
Why this Approach is Problematic

• Ignoring the liquidation value has two implications:
  → Because investors get 100% of the firm in liquidation, if the firm has value in liquidation, they need less equity upon conversion to compensate them for their initial investment.
  → Because investors get 100% of the firm in liquidation, the implied pre- and post-money valuation that is offered to the entrepreneur is overstated!
Why these Concerns are Important

- The approach ignores the value of the downside protection provided by the preferred feature of the security.
- This affects the implied value that the VC offers:

<table>
<thead>
<tr>
<th></th>
<th>Number of Investments</th>
<th>Cost</th>
<th>Value</th>
<th>Avg. % Value/Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Write-Offs</td>
<td>172</td>
<td>395</td>
<td>40</td>
<td>10.1%</td>
</tr>
<tr>
<td>Below Cost</td>
<td>221</td>
<td>596</td>
<td>225</td>
<td>37.8%</td>
</tr>
<tr>
<td>At Cost</td>
<td>70</td>
<td>187</td>
<td>187</td>
<td>100.0%</td>
</tr>
<tr>
<td>1-5x</td>
<td>382</td>
<td>1164</td>
<td>3059</td>
<td>262.8%</td>
</tr>
<tr>
<td>5-10x</td>
<td>83</td>
<td>242</td>
<td>1713</td>
<td>709.5%</td>
</tr>
<tr>
<td>Over 10x</td>
<td>76</td>
<td>206</td>
<td>3703</td>
<td>1797.6%</td>
</tr>
<tr>
<td>Total</td>
<td>1004</td>
<td>2790</td>
<td>8927</td>
<td>320.0%</td>
</tr>
</tbody>
</table>

- If firm is liquidated below cost, average recovery is 26.8% of cost; if liquidated at or below cost average recovery is 38.4%.
An Example to Make the Point

• Assume the VC invest $2M. And value of the firm at IPO is $V*$ with probability 0.5 and is liquidity for $V=$$1M with probability 0.5. What is the implied value $V*$ the VC is offering based on the deal terms of a convertible preferred contract?

• In order for the VC to earn a market return on her investment:
  $2M = 0.5\times40\%\times V* + 0.5\times100\%\times$1M,
  ➔ The implied value $V*$ is $7.5M$.

• In contrast, to break even under common stock we would need:
  $2M = 0.5\times40\%\times V + 0.5\times40\%\times$1M
  ➔ The implied value is $9M$
A Systematic Approach to Backing out the Implied Value, $V^*$

FV: Face value of preferred stock
CV: Min. enterprise value at conversion
Convertible Preferred as a Series of Options

- Option (A): \( V \) if \( V < FV \); \( FV \) if \( V > FV \). Thus,
  \[
  \min(V, FV) = V - \max(V - FV, 0)
  = V - \max(V - 2, 0)
  \]
  Equivalent to buying the stock and selling a call with a strike price of 2.

- Option (B):
  \[
  = s \max(V - CV, 0)
  = 0.4 \max(V - 5, 0)
  \]
  Equivalent to buying 0.4 calls with a strike of 5.

Option (A) + Option (B) = \( V - \max(V - 2, 0) + 0.4 \max(V - 5, 0) \).
Get \( V \) if \( V < 2 \); 2 if \( 2 < V < 5 \); and 0.4*5 if \( V > 5 \).
Back to Out \( V^* \) Using Option Pricing

- We know that if the VC is getting a market return:

\[
\$2M = \text{Value of Option (A)} + \text{Value of Option (B)}.
\]

- If we know the risk-free rate \( (r_f) \) and the strike prices \( (FV \text{ and } CV) \), and take a guess at the maturity \( (T) \) and the volatility of the investment \( (\sigma) \). The only thing we don’t know is \( V^* \). All we need to do is reverse engineer the Black Scholes formula.

- Thus, suppose \( r_f=5\% \), \( FV=2 \), \( CV=5 \), \( T=3 \), and \( \sigma=50\% \). What must \( V^* \) be?
Back ing out $V^*$

<table>
<thead>
<tr>
<th>$V^*$</th>
<th>Option A</th>
<th>Option B</th>
<th>Option A + Option B</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5</td>
<td>1.49</td>
<td>0.376</td>
<td>1.87</td>
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<tr>
<td>3.75</td>
<td>1.52</td>
<td>0.436</td>
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</tr>
<tr>
<td>3.85</td>
<td>1.52</td>
<td>0.46</td>
<td>1.98</td>
</tr>
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<td>3.9</td>
<td>1.53</td>
<td>0.472</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>1.53</td>
<td>0.496</td>
<td>2.03</td>
</tr>
</tbody>
</table>

- Note that Option A is $V^*$- an option with a strike price of 2 and Option B is an option with a strike price of 5