TOPIC 15

VENTURE CAPITAL IN BITOECHNOLOGY

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YSIOS CAPITAL

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Contents

Venture Capital Is an Alternative Form of Investment with High Risk and High Reward Potential

Venture Capital (VC)

Type of alternative investment whereby financing is provided by funds to small, early-stage, emerging firms in exchange for a portion of their capital

General Characteristics

- Lack of liquidity
- High risk, difficult to estimate
- Low/No revenues
- Growth through subsequent funding
- Weak asset base
- Low leverage
- New team
- But…High potential reward

Investable Markets

Public Equities
- Corporate Stocks
- Indices
- …

Fixed Income
- Bonds (Corporate, Government)
- Money Markets
- Asset Backed Securities
- …

Alternative Investments
- Real Estate
- Private Equity
- Venture Capital
- Commodities
- Derivatives
- Distressed Assets
- …

Source: Own Analysis

Venture Capital in Biotech Involves Very High Risk Investments with Block Buster Potential

Biotech VC Characteristics

- Binary outcomes (safety, efficacy…)
- High scientific specialization
- Blockbuster potential
- Intangible assets (R&D)
- Small sector (reputation is important)
- Dealing with animal & human lives (positive externalities, but also costs/regulations)

PHARMASSET

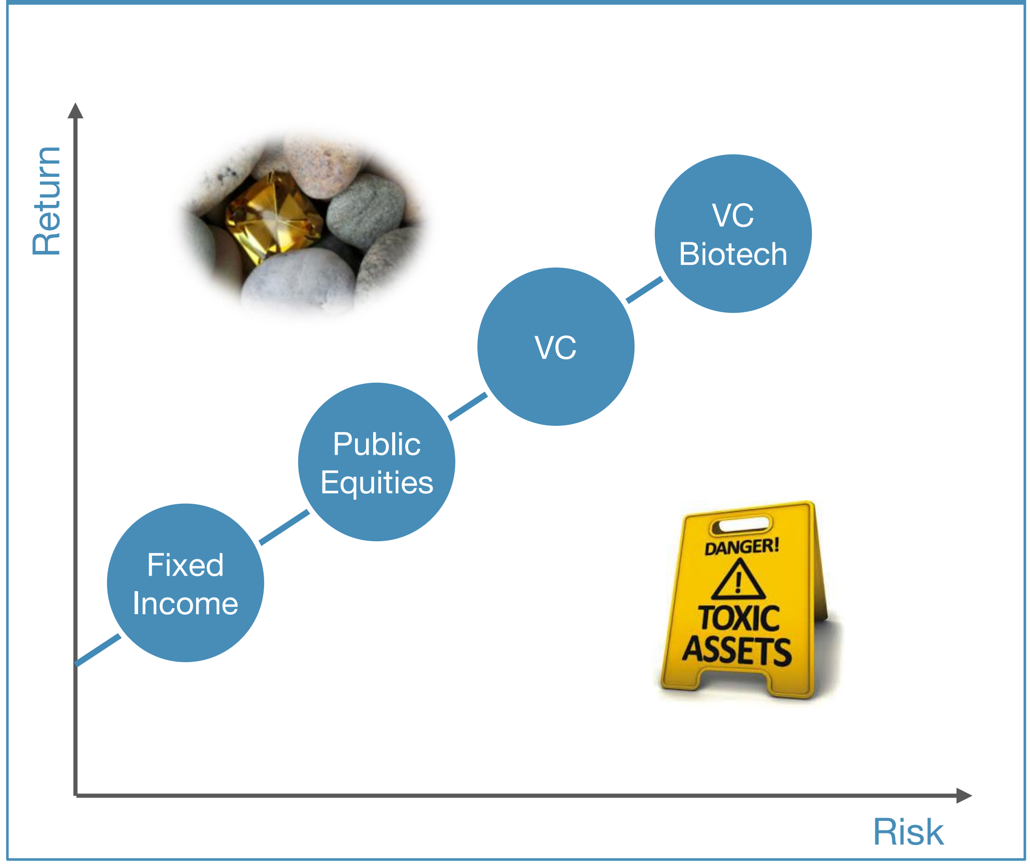
Founded: 1998

Product: Cure for HCV

Year Sold: 2011

Acquisition: Gilead paid $11 B

Assets on the Risk-Reward Line



Source: Own Analysis

01 Introduction to Venture Capital

VCs Obtain Capital from LPs, Which Is Invested in Start Ups, Later Sold to Pharma Companies

Management Fee

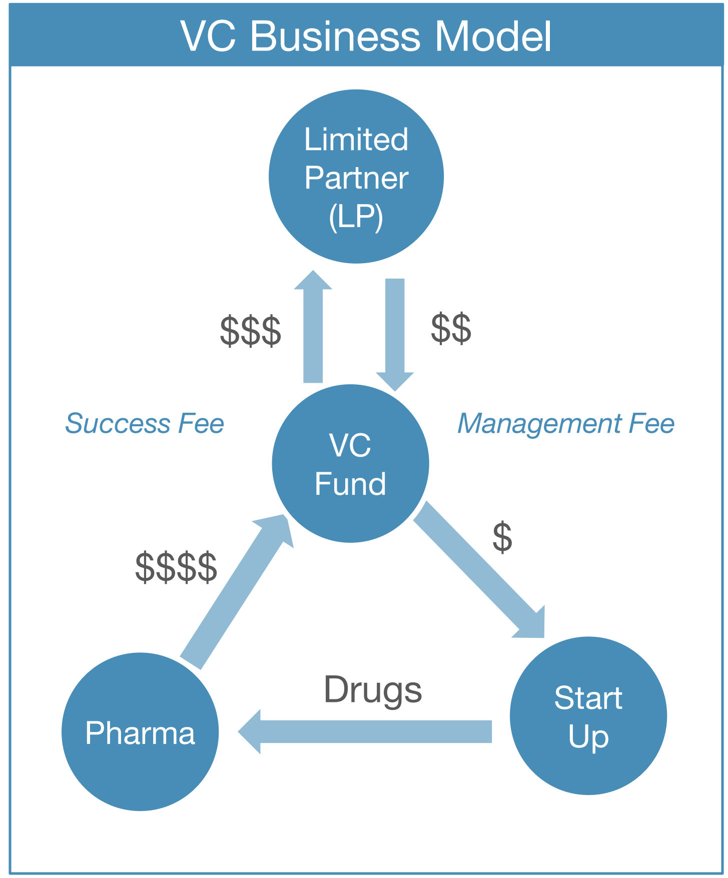
Charged periodically irrespective of the fund's performance. Typically 2% of the fund's size

Success Fee

Charged once the fund generated profits. Typically 20% of the profits

Closed-End Fund

Once the fund is raised, no more investors can invest in the fund



Source: Own Analysis

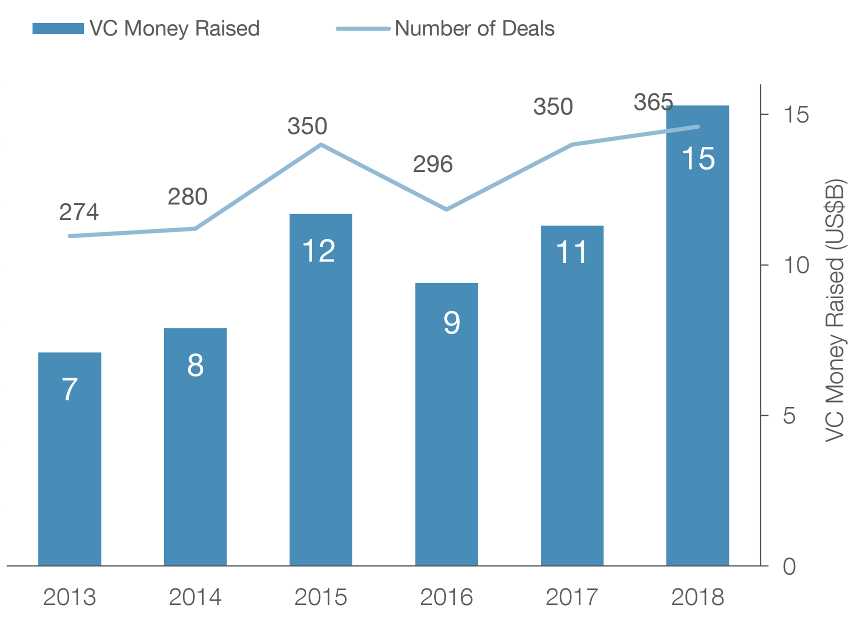
01 Introduction to Venture Capital

Record High of VC Investments in Biotech

Biotech companies attract increasing amounts of venture capital every year

VC investments in Biotech have topped $15B in 2018

Venture Capital Raised in Biotech



Source: Global Data / *Filters:* Financing deal between $10 and $200M in Europe and US

Contents

Pension Plans, Private Foundations and Public Institutions Are the Main LPs

Types of Limited Partners					
	Return	Risk	Liquidity Needs	Horizon	Biotech Appetite
Pension Plans	Plan liability discount rate +2%	Low/Moderate	As required to meet payouts	Determined by the participants	Low
Private Foundations and Endowments	Combination of target distribution, inflation, and expense rate	High	Mid/Low	Often perpetual	Depends
Insurance Companies	Return Needed to meet liabilities or higher	Low	High	Long (Life) Short (non-Life)	Depends
Banks	Contribute to interest earnings. Residual, to adjust assets/liabilities	Low	High	Short	Low
Public Institutions	Soft return requirements	Moderate	Low	Long	High
High-Net-Worth Individuals	Depends on profile	Depends on profile	Mid/Low	Depends on needs	Depends

Source: CFA Institute and Own Analysis

Biotech VCs have 5 Years to Invest and 10 Years to Liquidate the Fund

Fund's Life

Time period during which the VC fund makes investments, reinvestments, divestments, and liquidates the fund. Typically 10 years, but can be extended 2 years

Investment Period

Time period during which the VC fund completes the portfolio. Typically 5 years

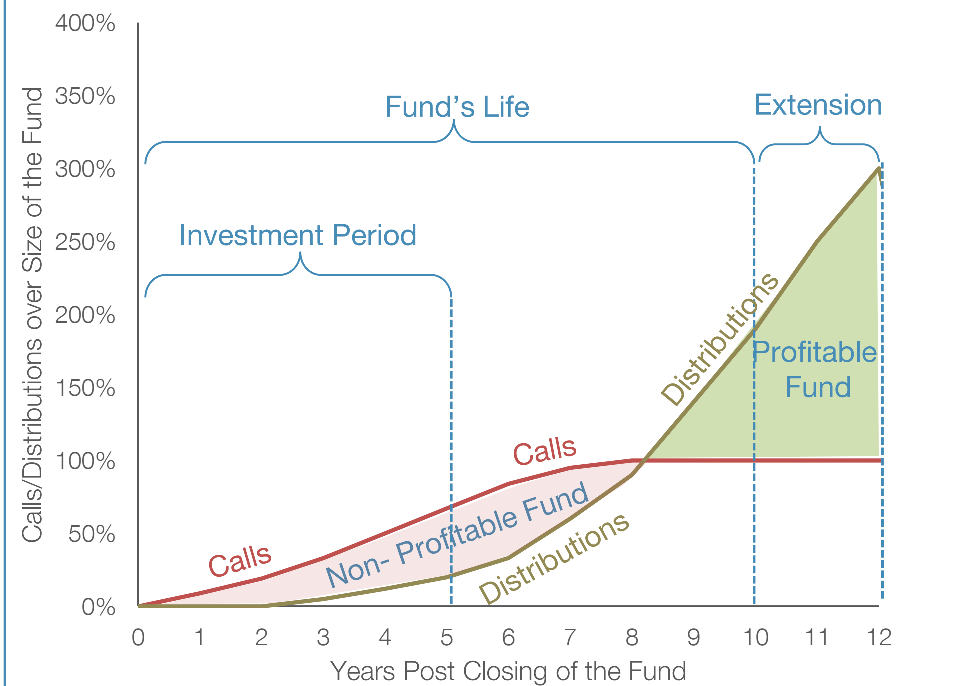
Capital Calls

Amount of Capital contributed by LPs out of their total commitment

Capital Distributions

Amount of capital that the VC fund returns to the LPs following divestments

VC Fund Timelines



Source: Own Analysis

VCs Mitigate Risk by Investing in a Handful of Companies

Number of Portfolio Companies

It depends on the fund's size, but typically between 10-20

Diversification

The less correlated the assets of the companies are with each other, the more diversified and less risky the portfolio is

Averaging Out

While the individual fate of companies tend to be binary (either success or failure), good returns compensate for bad returns. Overall, good portfolios usually generate net multiples of 2-4x at the end of the fund's life

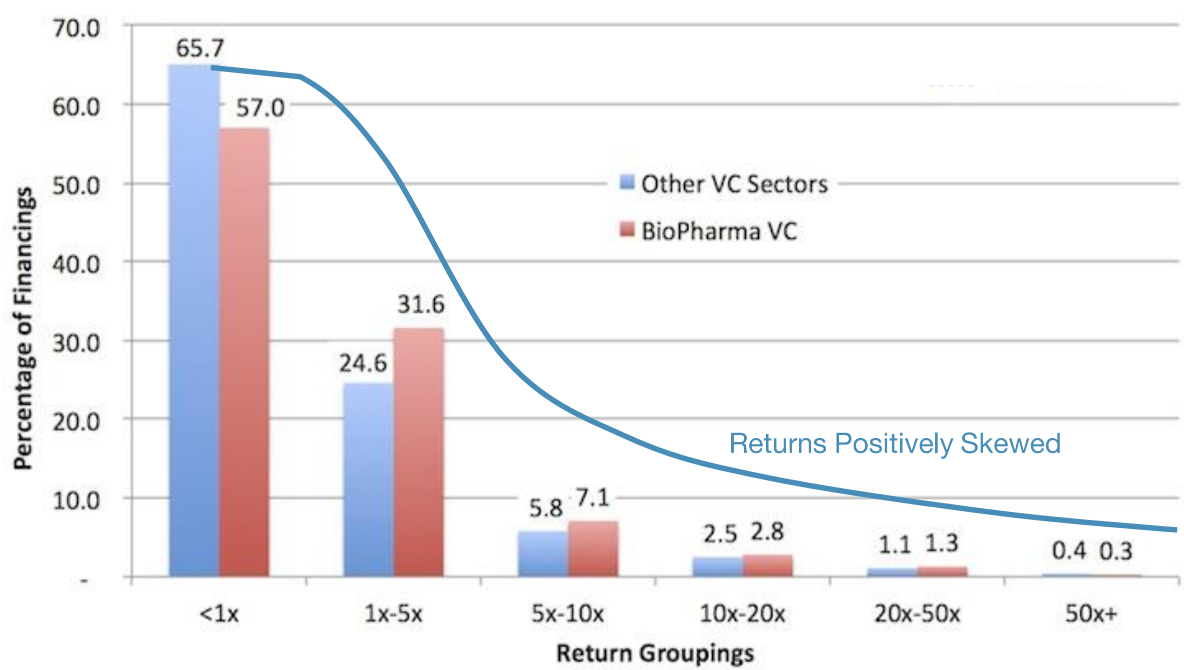
Example of Portfolio Performance

Company 1 5x	Company 2 0x	Company 3 3x	Company 4 2x
Company 5 1x	Company 6 10x	Company 7 2x	Company 8 0x
Company 9 1x	Company 10 6x	Company 11 0x	Company 12 5x
Company 13 8x	Company 14 2x	Company 15 0x	Company 16 4x

Source: Own Analysis

Biotech VC Returns are Positively Skewed and Tend to Be Higher Than in Other Sectors

Return Distributions in US VC*



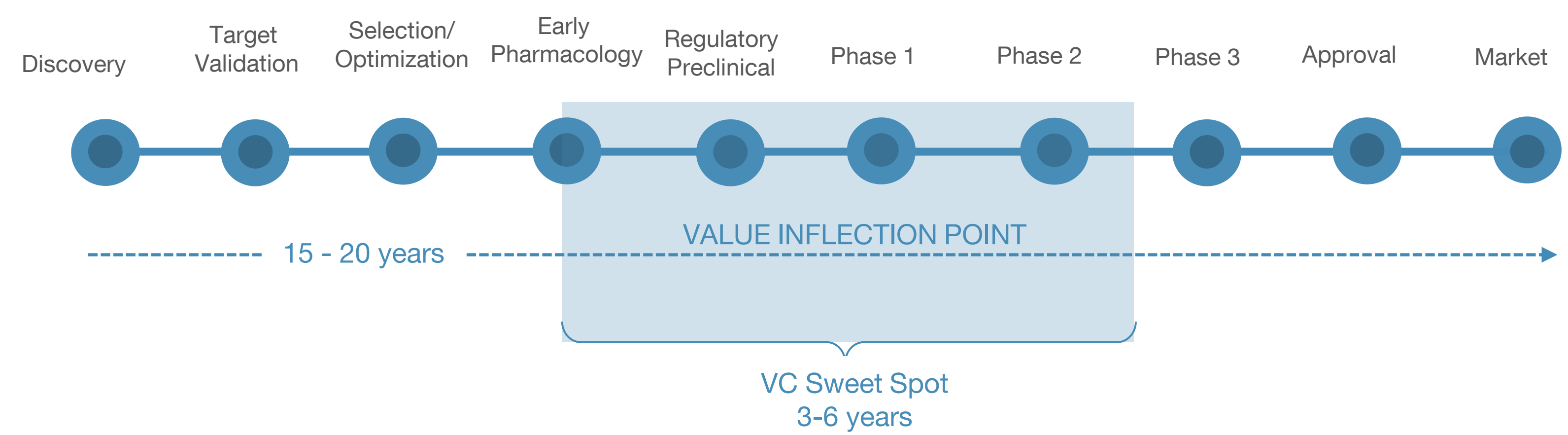
* By % of financing in companies going out-of-business, acquired or IPO (2004-2013)

Source: Correlation Ventures

Contents

Biotech VCs Typically Invest in Preclinical Phases and Divest at Proof-of-Concept

Financing Sources by Stage of Development



Source: Own Analysis

Investment Criteria Include Good Teams, strong IP protection and High Market Potential

Wanted Features of a Target Investment	
Talented Team	• Entrepreneurial and cohesive team • Proven track record • Shared company vision with the fund • Open to hire people for key positions if necessary
Innovative Products	• Novel technologies or smart combination of existing products • Strong data package supporting product claims
Significant Entry Barriers	• **Robust intellectual property and freedom to operate** • Unique know-how and expertise
High Market Potential	• Unmet medical needs in both large and niche/orphan indications • Clear competitive advantage and differentiation • Reasonable pricing and reimbursement assumptions
Attractive Valuation	• Moderately priced assets relative to their risk

Source: Own Analysis

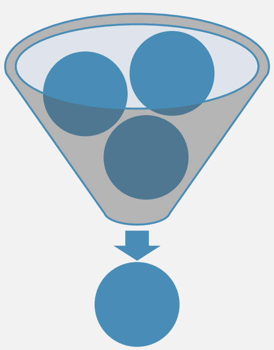
03 Investing into Start-Ups

After a Thorough Due Diligence Process, Only 1% of Opportunities Become an Investment

Screening

Investment Team

Identification of opportunities



Initial Due Diligence and Term Sheet

Science, clinical-regulatory, business

Advisors

Preliminary Due Diligence

- Science and technology review
- First assessments from experts
- Basic financials
- Investment report

Investment Committee

Initial assessment of the investment opportunity

- Price/Valuation
- Term Sheet

Confirmatory Due Diligence and Closing

Science, business, legal, **IP**

Advisors

Confirmatory Due Diligence

- Science and technology review: expert reports, legal, finance and intellectual property

Investment Committee

Decision

- Legal structure
- Financial structure
- Syndication with other investors
- Investment and Shareholders Agreements

Term Sheets Are Initial Documents Containing the Main Terms of an Investment

Pre-Money Valuation
Value given to the company before the investment. Number of fully-diluted shares before the investment multiplied by the price per share of the round

Post-Money Valuation
Value given to the company after the investment. It equals the pre-money plus the amount invested. It can also be calculated as the number of fully-diluted shares after the investment multiplied by the price per share of the round

Exclusivity
The company cannot entertain investment discussions with other VC funds during a certain period

Tranching
The invested amount is divided into several installments, which will be invested in the company as it achieves certain milestones

Ratchet (Anti-Dilution)
In case there is a subsequent round of financing at a lower valuation, investors will receive additional shares to compensate for the decrease in value

Liquidation Preference
When the company is sold, investors will receive one or two times their initial investment, before the proceeds are distributed pro-rata

Pay-to-Play
If a shareholder does not contribute to subsequent round of financing, his shares will lose all rights and be diluted at a certain ratio

Drag Along
If a majority of shareholders want to sell their stock, all the shareholders are obliged to do so

Pre-Money Valuation Determines the Percentage that Founders and Investors Will Get

Fully Diluted Shares (FD Shares)

FD Shares = Issued Shares + Non Issued Shares

Non Issued Shares include Stock Options and Shares issuable upon conversion into capital of a convertible loan. Convertible loans can convert at a discount of the share price. The larger the discount, the more number of FD Shares it will create.

Pre-Money Valuation (PrM)

PrM = FD Shares pre-Investment × Price per Share

Post-Money Valuation (PtM)

PtM (1) = (FD Shares + New Shares) × Price per Share

PtM (2) = PrM + Money Invested in the Last Round

FD Ownership Post Investment (FD%)

FD% = Money Invested / PtM

Example

Company A has 1,000,000 shares, 100,000 stock options, and a convertible loan worth $200,000 that converts into shares at a discount of 5% to the price per share of the next round

Investor B invests $3,000,000 in the company at a price per share of $2

Calculate: FD Shares, PrM, PtM, and FD%

Solution

$$FD\ Shares = 1{,}000{,}000 + 100{,}000 + \frac{\$200{,}000}{\$2 \times (1-0.05)} = 1{,}205{,}263$$

$$PrM = 1{,}205{,}263 \times \$2 = \$2{,}410{,}526$$

$$PtM(1) = \left(1{,}205{,}263 + \frac{\$3{,}000{,}000}{\$2}\right) \times \$2 = \$5{,}410{,}526$$

$$PtM(2) = \$2{,}410{,}526 + \$3{,}000{,}000 = \$5{,}410{,}526$$

$$FD\%\ investor = \frac{\$3{,}000{,}000}{\$5{,}410{,}526} = 55.44\%$$

$$FD\%\ insiders = (100\% - 55.44\%) = 44.56\%$$

The Venture Capital Method

(1) Risk/Return Assessment

Given the risk of an investment, we determine the minimum return by which that investment is worth doing

Ex: *Company A is very risky, we need a multiple of 8x to compensate the risk*

(2) Comparables

We analyze the values at which similar companies have been acquired

Ex: *Company A is very similar to company B, which was recently acquired for $400 M*

(3) Determine the Pre-Money and Post-Money

We determine the pre-money valuation that yields a multiple of 8x given the amount of our investment and assuming that Company A will be acquired for $400 M

Ex: If we invest $30 M in Company A, we need $240 M in proceeds at exit ($30 M x 8x), which means we need to own 60% of the company ($240 M / $400 M)

$30 M must represent 60% of the company, therefore the post-money is $50 M ($30 M / 0.6), or a pre-money of $20 M ($50 M - $30 M)

Company A is worth $20 M prior to the investment

Employee Stock Option Pool (ESOP) Allows Founders to Protect Ownership and Be Incentivized

Founders Ownership

With large financing rounds, founders' stock is diluted. ESOP partially protects their initial ownership and helps align their interests with the investors'. It also allows to attract and incentivize key employees. ESOP does not confer governance rights into the company

ESOP means more shares, hence it raises the pre-money valuation being paid by the new investor, who will see its FD% reduced

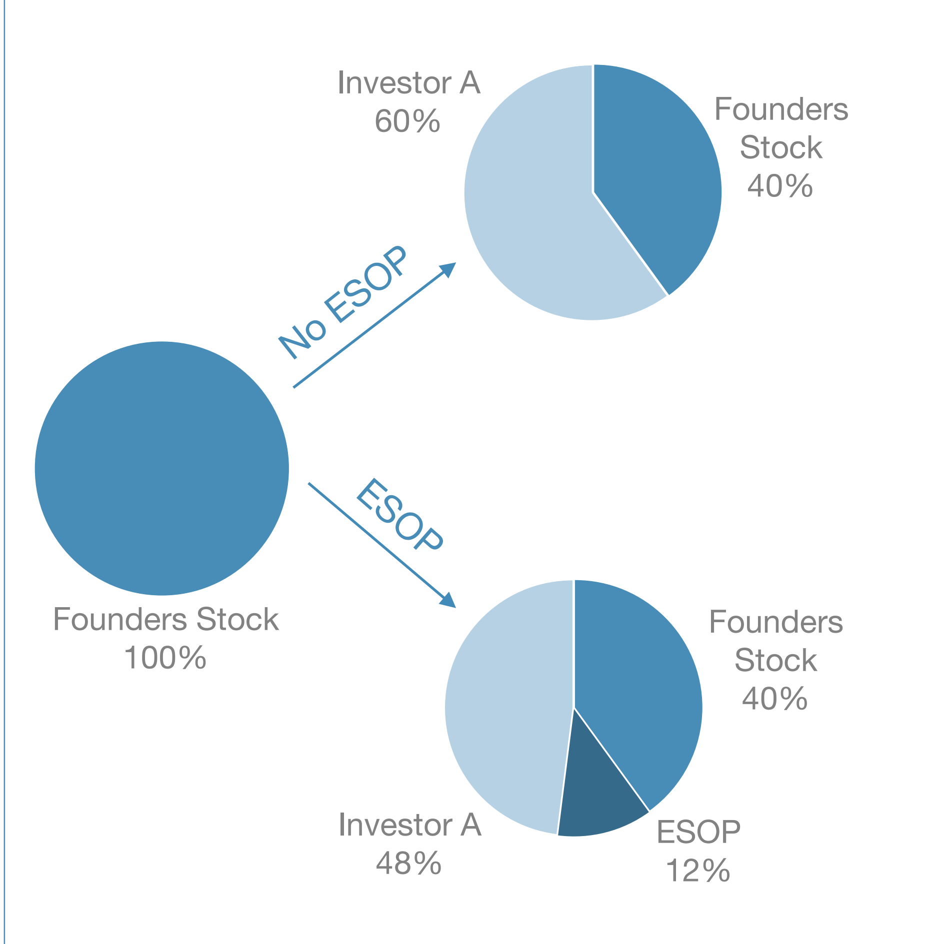
Granting & Exercise

ESOP is typically granted during the course of 5 years with a 1 year cliff, allowing for employee retention. It can be exercised at no cost or at a predefined exercise price

Refreshing

ESOP is not forever! With subsequent financing rounds ESOP will get diluted, so founders will have to negotiate a "refresh", i.e., maintain the previous ESOP %

The Effect of ESOP on FD Ownership



Source: Own Analysis

Contents

M&A and IPO are the Main Exit Routes for VC Funds

The goal of any investor is to realize an investment in the shortest period of time for the maximum amount of proceeds

M&A provide immediate liquidity and transfers risk from the shareholders to the acquirer

Because of that, M&A is the preferred exit strategy

Often times, IPOs are the only means available to "keep companies alive"

Pros and Cons of M&A and IPO

	M&A	IPO
Pros	• Immediate Liquidity • Transfers risk to acquirer • Ends holding period of the investment	• Catalyzes full value • Refinances the company • Can help develop a large stand-alone company • May by used as a lever to trigger an M&A
Cons	• May not catalyze full value • Pharma's moves are unpredictable • Founders may not benefit • Lose of control over ongoing and future trials	• Low liquidity in the short run • Shareholders need to give up rights • Increases holding period of investment • Risk is retained by the shareholders

Source: Own Analysis

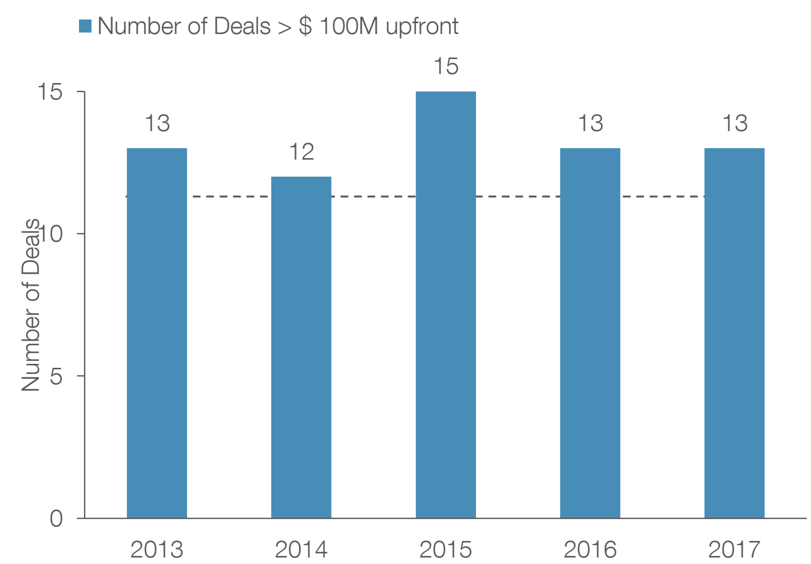
04 Exiting Investments

The Number of Lucrative M&A deals is Stable over the Years

Every year, 12 to 15 Biotech VC-backed companies are acquired by large pharmaceutical corporations

This provides a stable environment to plan for M&A exits

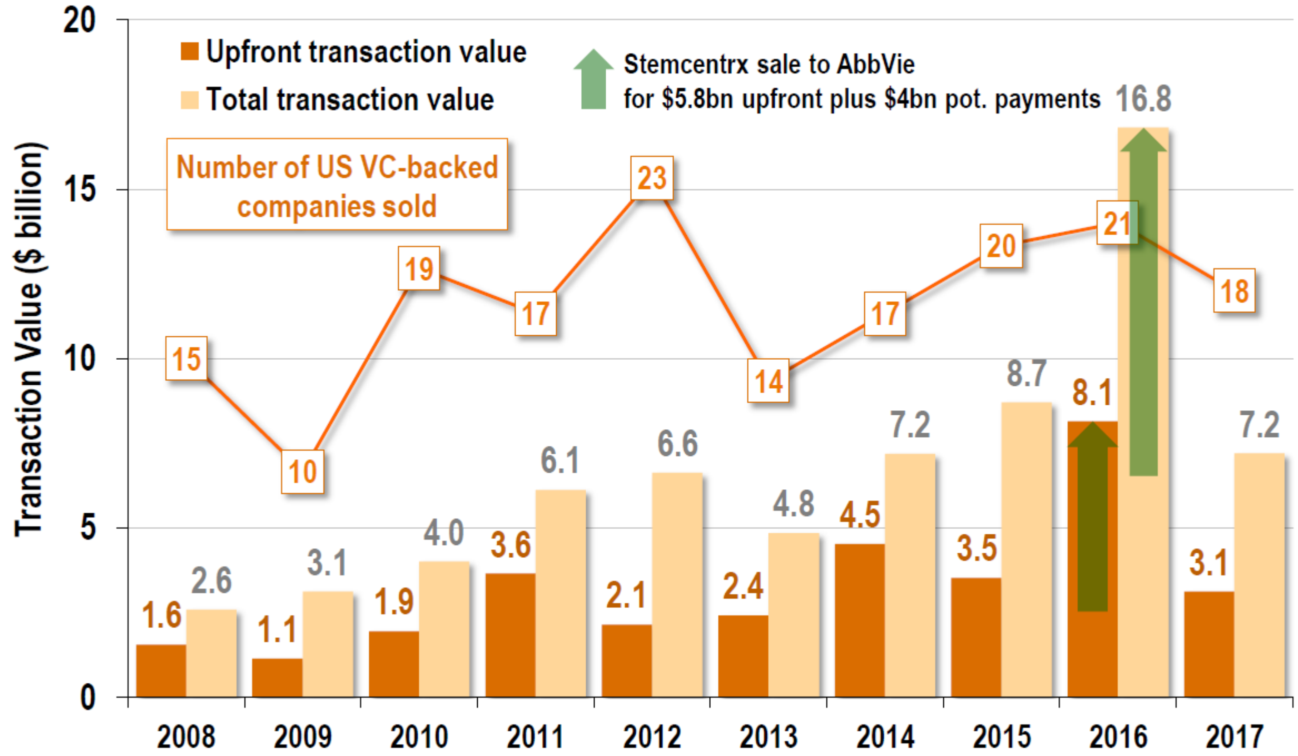
VC-Backed M&A Deals



Source: HBM Pharma/Biotech M&A Report 2017

Pharmaceutical Companies Try to Share Risk When Acquiring a Company

US M&A Total Upfront and Milestone Payments



Source: HBM Pharma/Biotech M&A Report 2017

04 Exiting Investments

When Liquidation Preference Comes into Play

For investors, Liquidation Preference is both a return enhancement and a downside protection strategy

For founders and early investors, it dilutes *de facto* their participation in M&A proceeds

A way to mitigate that is to restrict the effect of the liquidation preference within a range of investor's returns

Example

Company A's shareholder base includes the founders, who own a 30% of the company (including stock options) and Investor A, who owns 70% of the company. Investor A invested $10 million in the past.

The company is acquired for $100 million.

Calculate: With and without a Liquidation Preference of 1.5x, (a) the amount of proceeds that the founders and Investor A will obtain from the exit, (b) the investment multiple that Investor A will obtain

Solution with Liquidation Preference

$$LP = \$10\ M \times 1.5 = \$15\ M$$

$$Proceeds\ Investor = \$15\ M + (\$100\ M - \$15\ M) \times 0.70 = \$74.5\ M$$

$$Multiple\ Investor = \frac{\$74.5\ M}{\$10\ M} = 7.45x$$

$$Proceeds\ Founder = (\$100\ M - \$15\ M) \times 0.30 = \$25.5\ M$$

Solution without Liquidation Preference

$$Proceeds\ Investor = \$100\ M \times 0.70 = \$70\ M$$

$$Multiple\ Investor = \frac{\$70\ M}{\$10\ M} = 7.00x$$

$$Proceeds\ Founder = \$100\ M \times 0.30 = \$30.0\ M$$

Contents

05 Conclusions

1. Venture Capital in Biotech is a high risk/high reward asset class
2. The business model of biotech VC funds consists of managing Limited Partners' money by investing in biotech start-ups and then selling these to pharmas
3. Binary risk is mitigated by investing in a number of companies
4. Biotech VCs invest in the value inflection points of the drug development process
5. Pre-Money valuation determines the ownership of both the founders and new investors
6. Pre-Money valuation is a function of the risk/return profile of a company. Risk can be assessed by the quality of the team, IP protection, development complexity, among others. Potential return can be assessed by comparables
7. ESOP allows for management ownership retention and incentivization
8. M&A are the preferred route of exit of VC funds because they provide immediate liquidity and transfer of risk
9. Liquidation preference increases investors' returns and decreases founder's returns