Session 15 :
Understanding the activities of a TTO

Venturing and spinouts

Ashley Stevens

Who's Speaking

Ashley Stevens

PhD, CLP, RTTP

Dr. Stevens is a biotech entrepreneur and technology commercialization expert. He co-founded Genmap, Inc. and Kytogenics, Inc., bringing academic innovations to market. He later led technology transfer at Dana-Farber Cancer Center and Boston University, where he helped launch 55 startups. He currently teaches commercialization at Osaka University.

Affiliation

- Past President Association of University Technology Managers, USA(AUTM)
- Head of Tech Transfer for Boston University
- President Focus IP Group, LLC

Acknowledgements

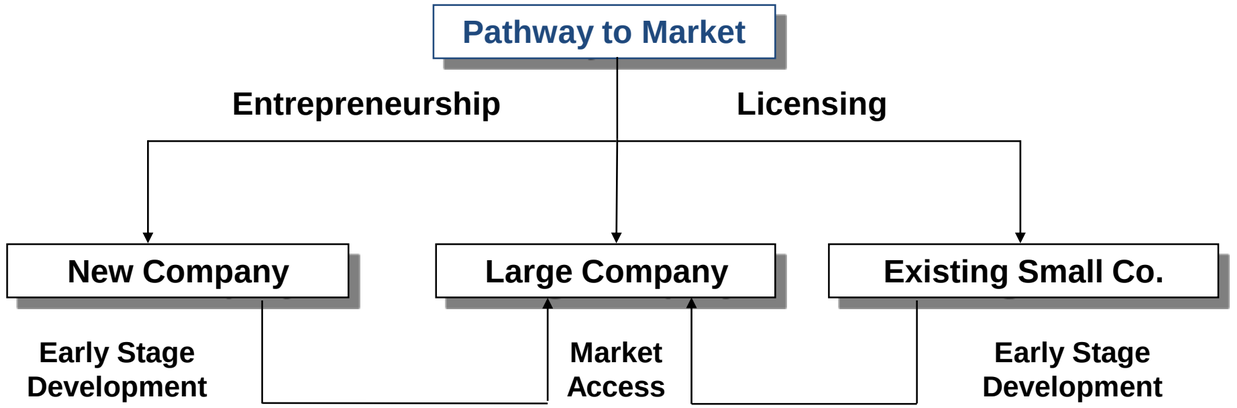
- Lita Nelsen, MIT
- Steve Sammut, Penn
- Teri Wiley, Mt. Sinai Hospital

When Do You Start A Company?

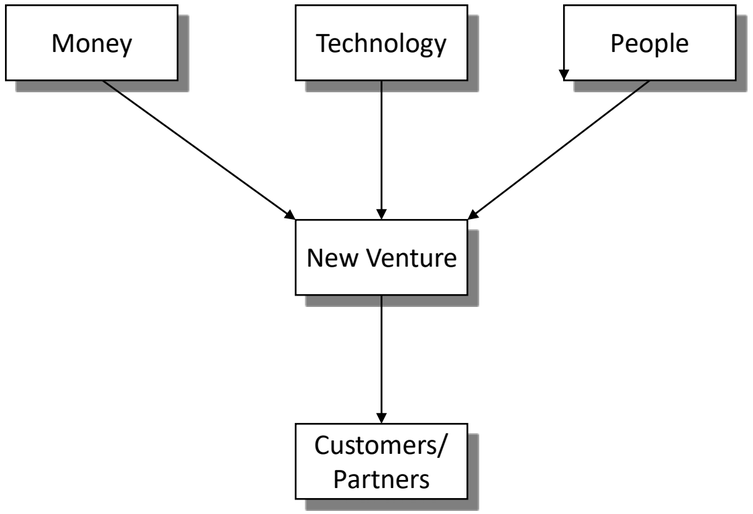
- Incremental inventions generally get licensed to existing companies
  - Small
  - Medium
  - Large
- Revolutionary inventions generally need a startup
  - Existing players don't believe their technology will become obsolete
    - All that invested capital
- In US:
  - SME's 55-60%
  - Large 20-25%
  - Startups 20%

FLVA

FLTA



What do you need to launch your venture?



University Spin-Out Companies

- Typically enabled by the University rather than organized by the University
- Driving force generally the faculty inventor, a post-doc or graduate student and an entrepreneur
  - Negotiate a license or option to the patents
  - Write business plan
  - Raise start-up funding
- License intended to ensure that
  - The technology is developed or the license terminated
  - The University is fairly compensated for success
    - Equity stake – spreads risk
    - Technology specific payments
      - Normal licensing terms

"Equity is just cash that hasn't turned green yet"

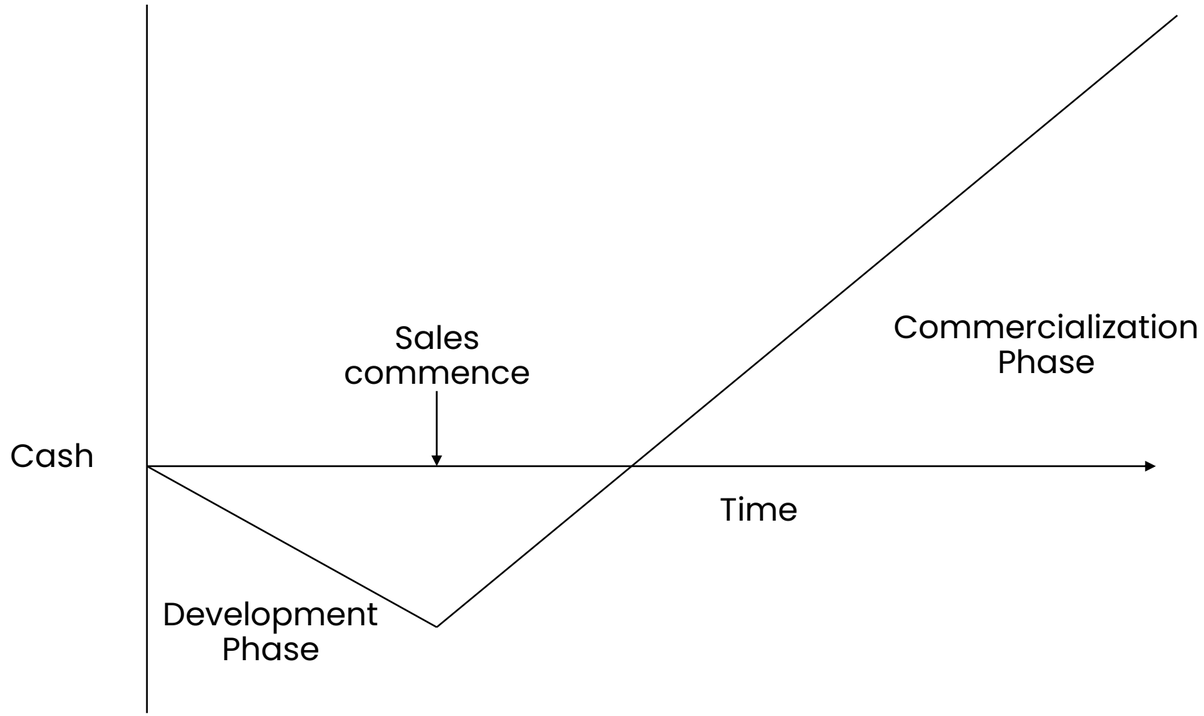
Joyce Brinton
Harvard University
1998

Agenda

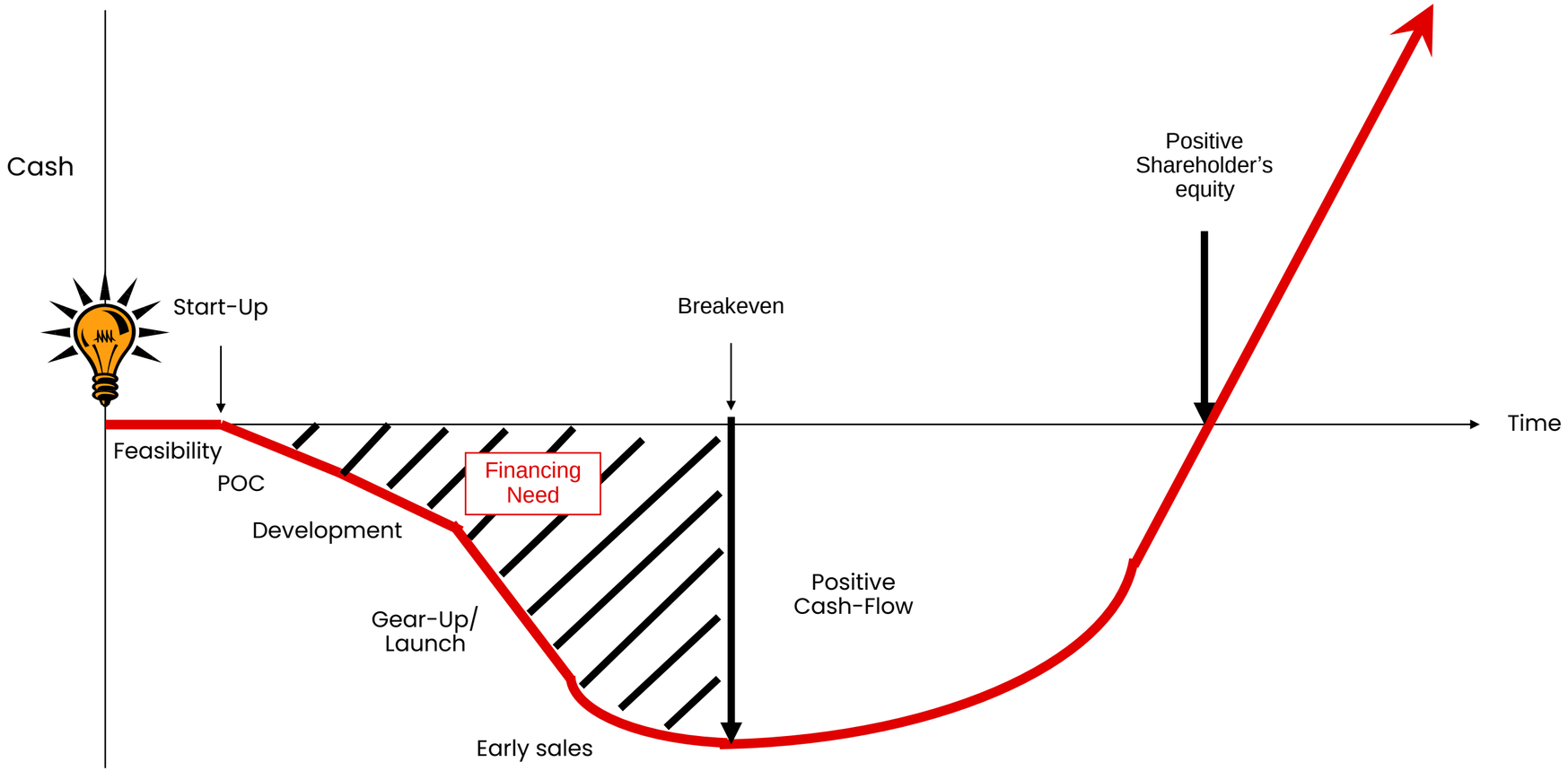
- The Financing Cycle of a Start-Up Company
- What is Equity?
- Ideal Cycle of Funding
- The Dark Side
- Exit Mechanisms
  - IPO
  - Acquisition

The Financial Life Cycle of a Company

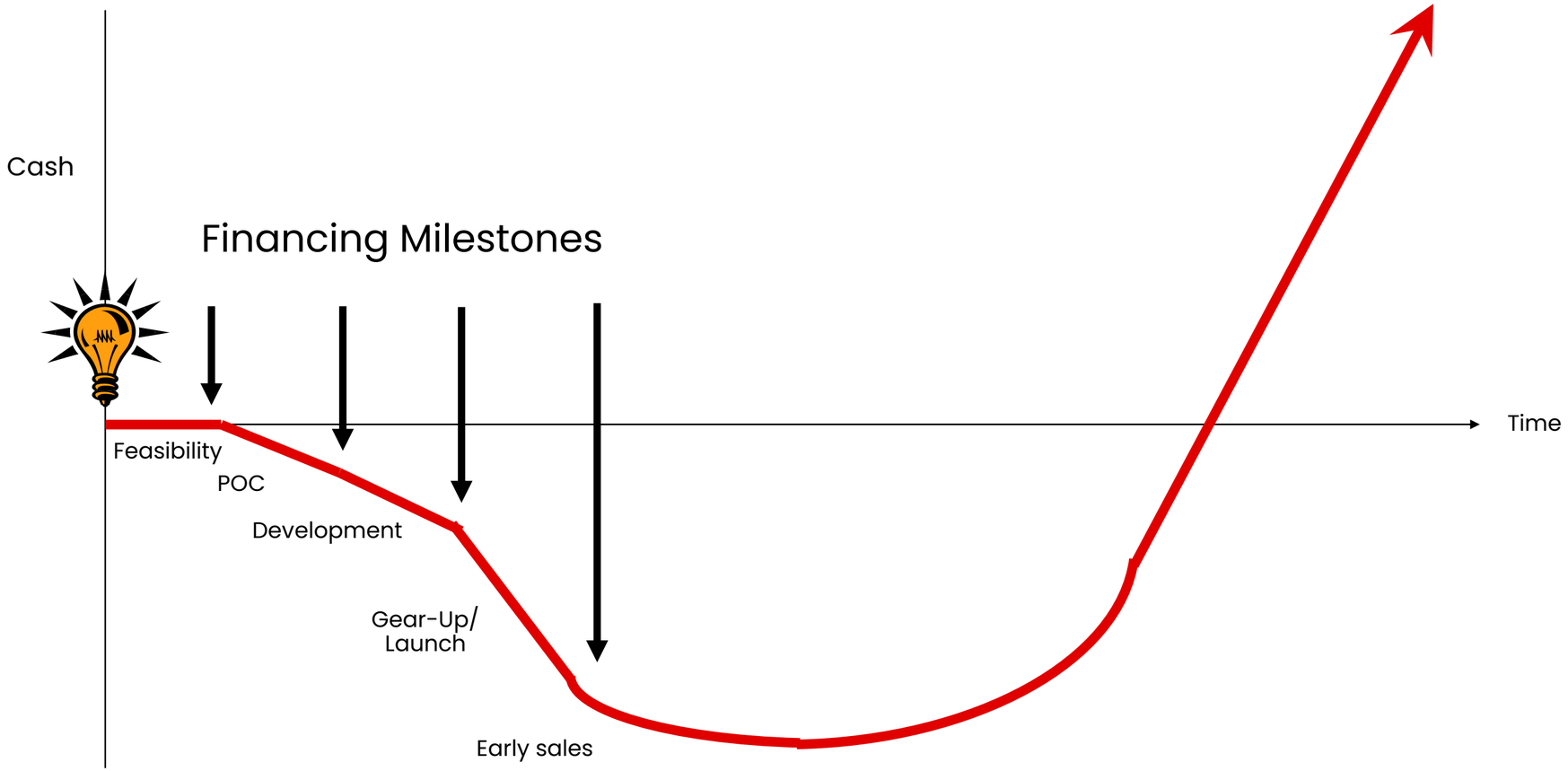
The Valley of Death – 35,000 Feet View



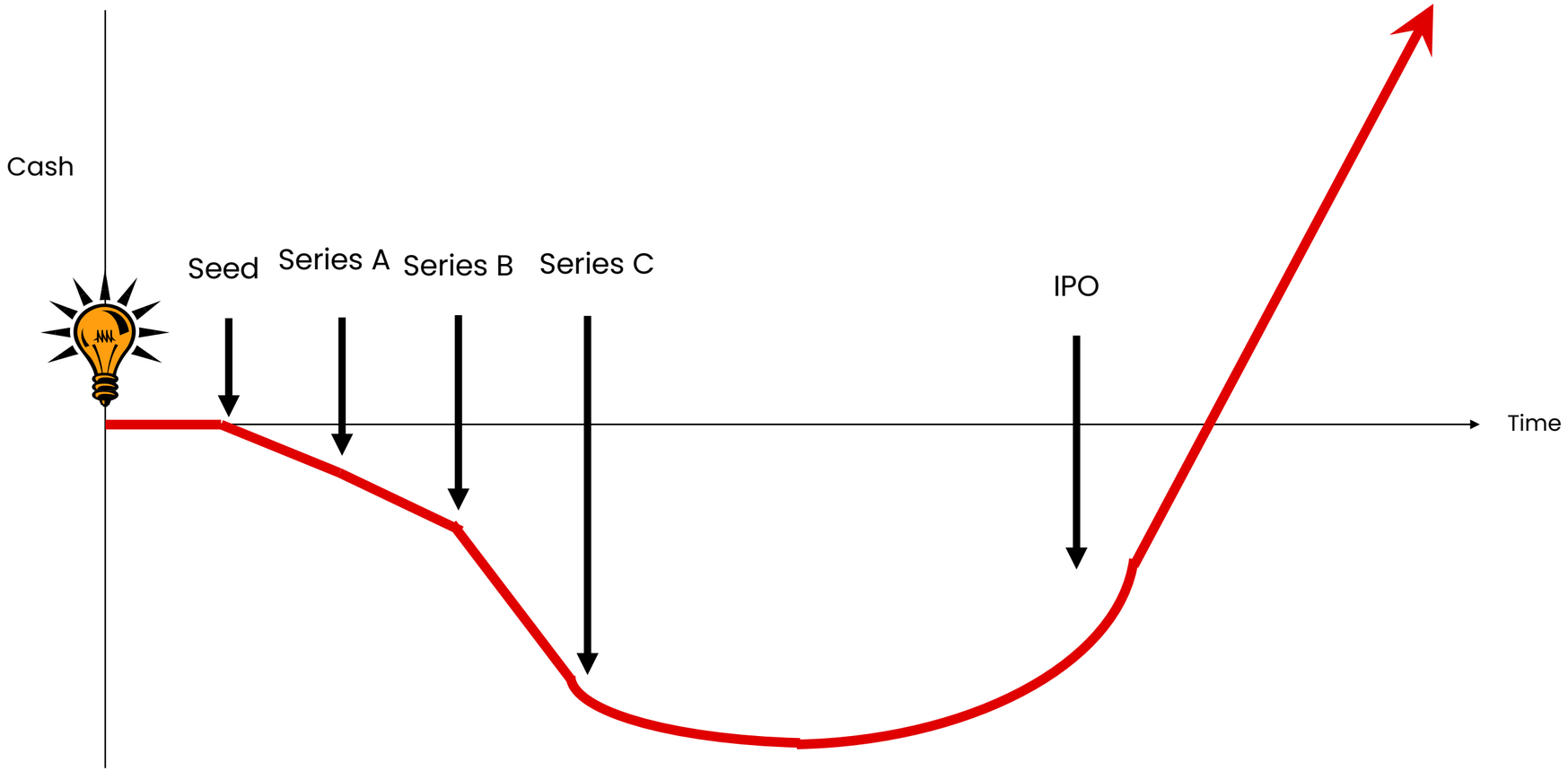
Cost Driven Negotiation



Cost Driven Negotiation



Cost Driven Negotiation



How Does a University Get Equity in a Company?

- Part of a license
  - Either in lieu of upfront fee, plus normal other cash royalty terms
    - Milestones, annual minimums, running royalties, etc.
  - Or, fully paid up
- Best practice is the first
  - Equity gives some return if the license is terminated
  - Cash terms give a return if product succeeds but equity is diluted to nothing
- Example: BioVex
  - UCL spinout
  - All equity, UCL and prof each got 25% of initial equity
    - Got as far as a Series F, raised $150 million including one down round
    - Bought by Amgen for $425 million plus $575 million in milestones
      - Product was approved.
        - Professor and UCL made £475 (each)
      - Postdoc joined the company, kept getting options, made many £mm

How Does a University Get Equity in a Company?

- Providing services
  - Incubation space
  - Interim management
    - Writing the business plan
    - Fund raising
  - Recruiting the management team
- Investing in the company
  - Needs an investment fund

University Financing

- Most university assistance to spin-outs is in-kind
  - Business plan development
  - Management team recruitment
  - Incubation
  - Pre-seed grant funding
- Some universities have their own funds
  - Saved from a “big hit”
  - From operating budget
  - Part of endowment
  - Alumni
  - Philanthropic

Capitalization Tables

What is a Cap Table & Why Are they Important?

- The Cap Table shows:
  - What the company is worth;
  - Who owns how much of the company; and
  - How much their share is worth.
- The Cap Table's changes over time shows:
  - How the company's value is changing
    - Up or down
  - Who's going to get how much when the company is sold or goes public.

The Cap Table Pre-Financing

Dividing the Pie Between the Founders

- Easy route is equal shares
  - Simplistic
    - Different people bring different things and make different commitments
- A rational analytical approach:
  - Multivariable Contribution Analysis
    - Remember: Always have a basis for your proposals

Multivariable Contribution Analysis
1. Factors and Weights

	Weight	Founder 1	Founder 2	Founder 3	Founder 4
Idea	7				
Business Plan	2				
Technology -- patents	7				
Technology – know-how	4				
Commitment and Risk	5				
Domain Expertise	7				
Responsibilities	6				

Multivariable Contribution Analysis
2. Absolute Scores

	Weight	Founder 1	Founder 2	Founder 3	Founder 4
Idea	7	6	2	2	0
Business Plan	2	2	7	1	0
Technology -- patents	7	0	0	0	10
Technology – know-how	4	0	0	5	5
Commitment and Risk	5	4	2	4	2
Domain Expertise	7	0	7	0	0
Responsibilities	6	0	6	4	0

Multivariable Contribution Analysis
3. Weighted Scores and Percentages

	Weight	Founder 1	Founder 2	Founder 3	Founder 4	Total
Idea	7	6	2	2	0	58
Business Plan	2	2	7	1	0	25
Technology -- patents	7	0	0	0	10	70
Technology – know-how	4	0	0	5	5	20
Commitment and Risk	5	4	2	4	2	60
Domain Expertise	7	0	7	0	0	49
Responsibilities	6	0	6	4	0	60
	66	121	65	90	342	342
	19.3%	35.4%	19.0%	26.3%		

How Much for the University?

- US
  - Two Models
    - Anti-dilution model
      - “Give me 5% and keep me at 5% till $5 million in equity financing has been raised”
        - Often combined with pre-emptive rights
          - Right to invest to maintain that 5%
          - Needs an investment fund to be able to exercise
    - Co-Founder Model
      - University treated just like other founders
        - E.g., 4 founders plus university – 20% each
      - Diluted equally in subsequent financings

Columbia University Model

- Standard equity model for every start-up
  - For all sectors
    - 5% ownership
    - Maintained till company closes a Series A financing typical for that sector
  - Royalty terms vary by sector
    - Higher for software and pharmaceuticals
    - Lower for engineering, manufacturing
      - Depends on profitability
- Start-up and Columbia bring data relevant to that sector as basis for negotiations

University Equity Models

- U.K. Model (Big 6 at least)
  - University 50%
  - All other founders 50%
- All equity – fully paid up
  - No royalties, milestones, etc.
- Has resulted in some interesting initiatives
  - Imperial Innovations plc
    - Publicly traded on AIM
  - IP Group (formerly IP2IPO)
    - Funded new Oxford Chemistry building
    - Deals with a number of U.K. universities
      - Southampton, Leeds, York, Kings, Bristol, Surrey, Bath, Glasgow
  - Oxford Science Enterprises
    - £850 million in 2 funds

The Cap Table During Financing

Tech Transfer Online

UNIDO

VENTURE CENTER

Definitions

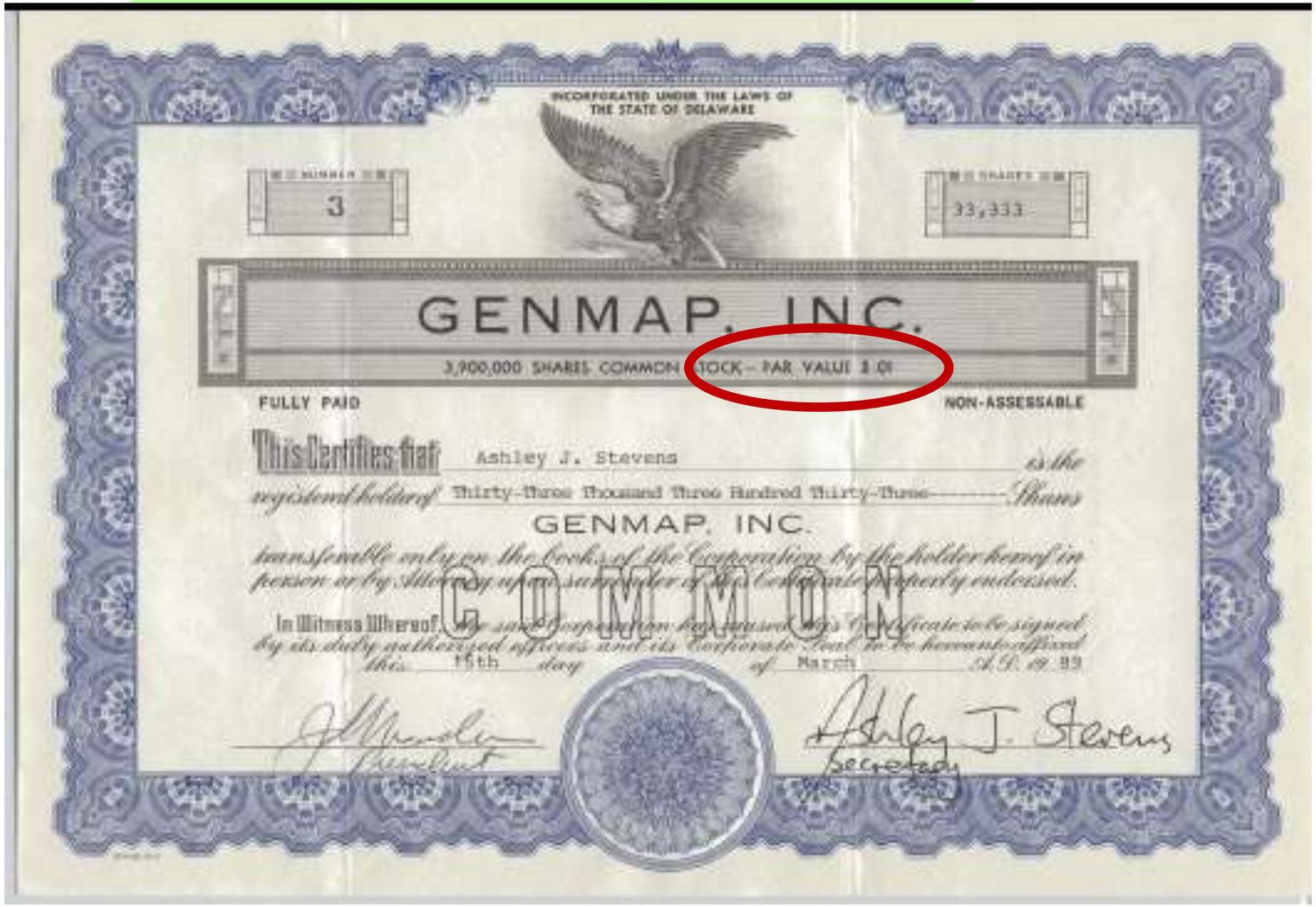
Common Stock

- Stock represents a partial ownership in a company
  - “Shares” of:
    - Assets
    - Income
- Not debt
  - No obligation to repay
- Common stock generally paid for by effort
  - The original “sweat equity”
    - Founders, management, technology, consultants
  - Freely available pre-financing
  - Financial sources will tightly control creation after financing
- Generally, the stock that gets sold in a public offering or M&A
  - All other classes of stock get converted to common the night before

Definition

Founders' Stock

- The first stock sold in a company by the people who found the company
- Common stock
- Sold at par value – typically $0.01 or $0.001/share
  - Company has no assets at this time
    - Fair Market Value
  - Provides the initial "running around money"
    - e.g., 2 million shares @ 1¢/share = $20,000
      - Enough to pay incorporation costs
  - Maximizes tax benefits for Founders
    - No immediate tax liability
    - All gain is taxed at Capital Gains rates



Founders Round

Price per Share		$0.01			
		Shares	Raised	%	Value
Professor		500,000	$5,000	20%	$5,000
Postdoc A		250,000	$2,500	10%	$2,500
Postdoc B		250,000	$2,500	10%	$2,500
University		500,000	$5,000	20%	$5,000
CEO		1,000,000	$10,000	40%	$10,000
Total		2,500,000	$25,000	100%	$25,000
Issued and outstanding		2,500,000			
Fully diluted		2,500,000			
Raised in this round		$25,000			
Cumulative raised		$25,000			

The #1 Mistake of Start-Ups

- Giving out too much Founders' equity to people who don't join the company
  - Extraordinarily demotivating to people who do
  - VC's may insist it get undone
    - See *startup.com*

You Need Committed People

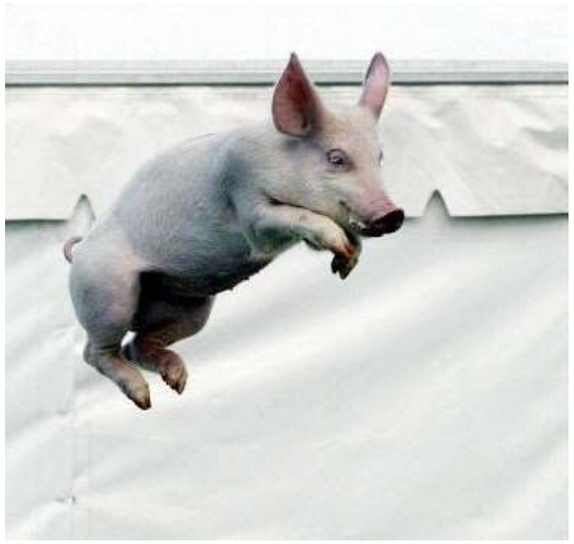
- What's the difference between involvement and commitment?

Think Back to the Last Time You Had Egg and Bacon for Breakfast

It Took Two Animals to Produce that Meal

A Chicken

&

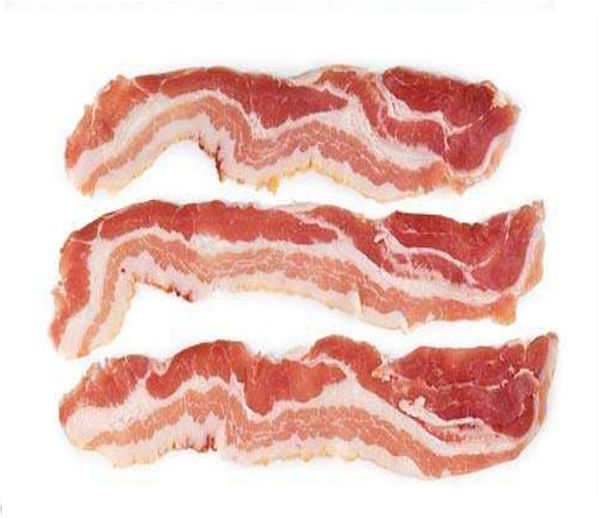


a Pig

Now the Chicken

was certainly involved

But the Pig



was definitely **COMMITTED!**

The Solution

- Have an earn-in
  - Make sure people commit
    - And stay committed!
  - 4 years is typical
    - 1 year cliff
- Inventors of the technology
  - Vest all their Founders' stock when they assign their interest in the IP to the company

Seed Round

- First “serious” money going in
  - $150,000 - $1,000,000
- Fund to proof of principle stage
  - If at proof of principle stage, may be able to go straight to VC rounds
- Sources
  - Friends and family (aka, Friends, family and fools)
  - Angels
  - Bands of Angels
  - Seed funds
    - Economic development funds
- VC’s won’t invest this little
  - High transaction and due diligence costs

Definitions

Issued and outstanding

Shares which have been paid for and for which a share certificate has been issued

- As opposed to shares which have been promised to someone through an option or warrant

Authorized Capital

Number of shares the Board of Directors has authorized the company to sell

- Gets increased from time to time

Definition

Pre-Money

- The Heart of Start-Up Valuation
  - The price of the company's stock agreed by the buyer (the new investor) and seller (the company)

A NEGOTIATED FIGURE

- Not an accounting-derived figure
- Determines how much of the company the next round of investment will buy and hence the dilution to existing shareholders

Example

- Suppose $2 million is to be raised at $1/share
  - If Pre-Money value of company is $1 million
    - 1,000,000 shares already exist
    - 2,000,000 shares will need to be sold
      - 2x what already exists
    - New shareholders will now own two thirds of the company
    - Dilution is by two thirds
  - If Pre-Money value of company is $5 million
    - 5,000,000 shares already exist
    - 2,000,000 shares will need to be sold
      - Only 40% more than currently exist
    - New shareholders will own 28.6% of the company
    - Dilution is by 28.6%

Some Fundamental Relationships

Number of Shares Sold	=	Amount Raised / Price Per Share
Post-Money Value	=	Pre-Money Value + Amount Raised
% Dilution	=	Amount raised / Post-Money Value

Seed Round

- Founders want to raise $200,000
  - Decide to price at 80¢/share
- How much of the company should they give up?
  - 10% ownership “feels” about right
  - Values the company at ~$2,000,000 pre-money
- Professor’s stake now worth $400,000

Seed Round

Price per Share	**$0.80**			
	Shares	**Raised**	**%**	**Value**
Professor	**500,000**		**18.2%**	**$400,000**
Postdoc A	**250,000**		**9.1%**	**$200,000**
Postdoc B	**250,000**		**9.1%**	**$200,000**
University	**500,000**		**18.2%**	**$400,000**
CEO	**1,000,000**		**36.4%**	**$800,000**
Seed investors	**250,000**	**$200,000**	**9.1%**	**$200,000**
Total	**2,750,000**	**$200,000**	**100.0%**	**$2,200,000**
Issued & outstanding	**2,750,000**			
Fully diluted	**2,750,000**			
Raised in this round	**$200,000**			
Cumulative raised	**$225,000**			
Pre-Money	**$2,000,000**			
Post-Money	**$2,200,000**			

Definitions

Convertible Debt (Note)

- A debt obligation of a company that is convertible into stock
  - i.e., A loan that won't be repaid
- Used when the parties don't want to set the price of the stock at the time the investment is made
- Simple document
  - Legal costs low

Dilution

- A decrease in a shareholder's percentage ownership without a reduction in the number of shares they hold because additional shares are issued
  - Size of the pie increases
- Results from:
  - Hiring new employees
  - Raising money
- Founders DON'T sell their own shares when selling equity
  - Company issues new stock
- Professor A owned 20% before seed round; now (s)he owns 18.2%
  - But the value of her / his stake has gone from $1,000 to $400,000
  - This is good!

Definitions

Good Dilution

- Dilution is good if the new shares are sold at a price greater than previous sale
  - Percentage of ownership is less, but the total value of shares owned is greater
  - Smaller slice of a bigger pie
    - Value of ownership stake increases

Bad Dilution

- Dilution is bad if the new shares are sold at a price less than the previous sale
  - Percentage of ownership is less, and the total value of shares owned is less
  - Smaller slice of a smaller pie
    - Value of ownership stake decreases
  - A “cram down”

Definitions

Option

- Right to buy stock at a fixed price for some time in the future
  - Generally personal to the holder (or their estate)
- Two Types under US tax laws:
  - Incentive Stock Option (ISO)
    - Tax treatment much more favorable
    - Only available to employees
  - Non-Qualified Stock Options (NQSO)
- Benefit:
  - You don't have to put out the money to buy the stock till you know it's going to be worth something
    - Or pay any taxes!

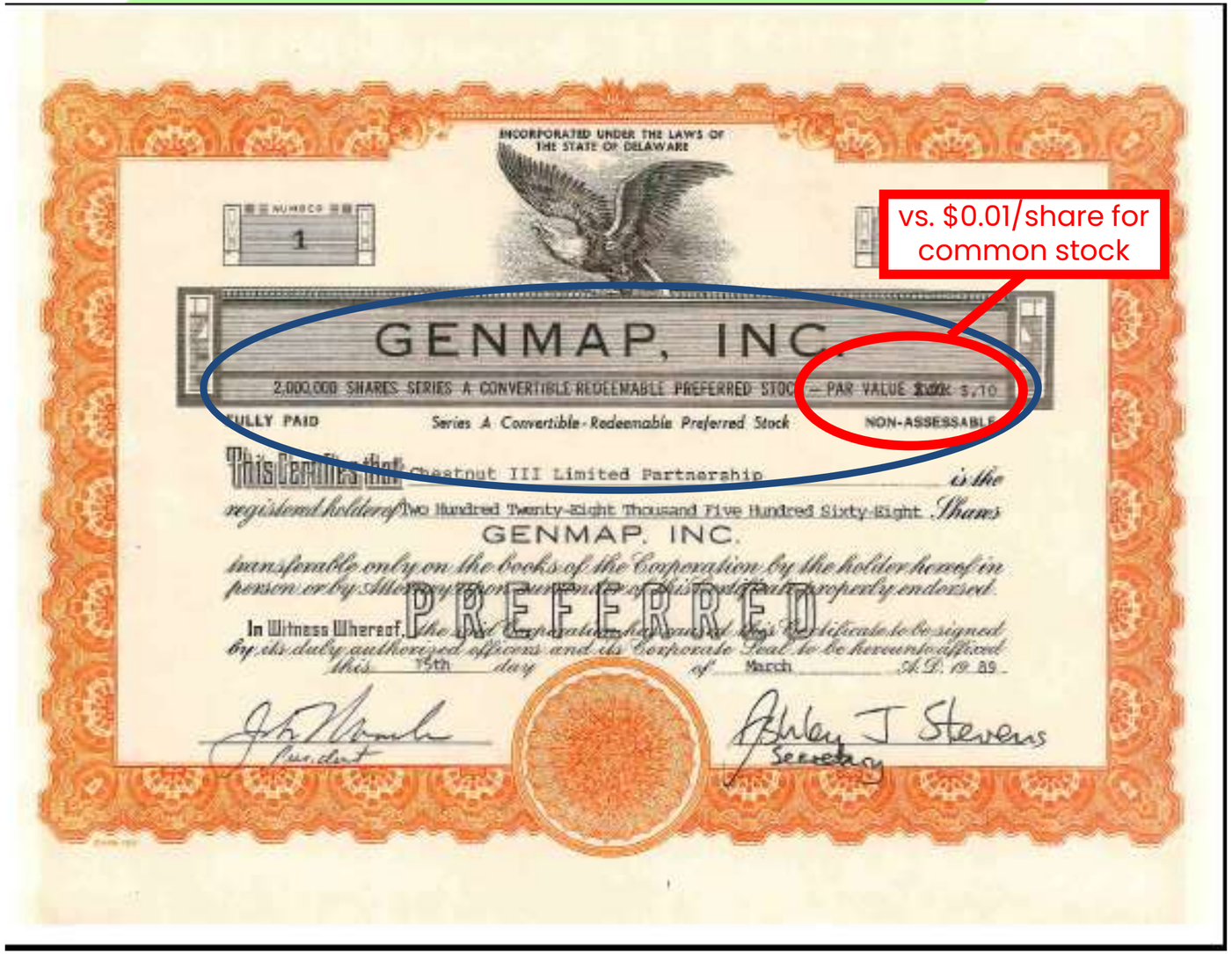
Warrant

- Right to buy stock at a fixed price for some time in the future
  - Can be bought and sold

Definition

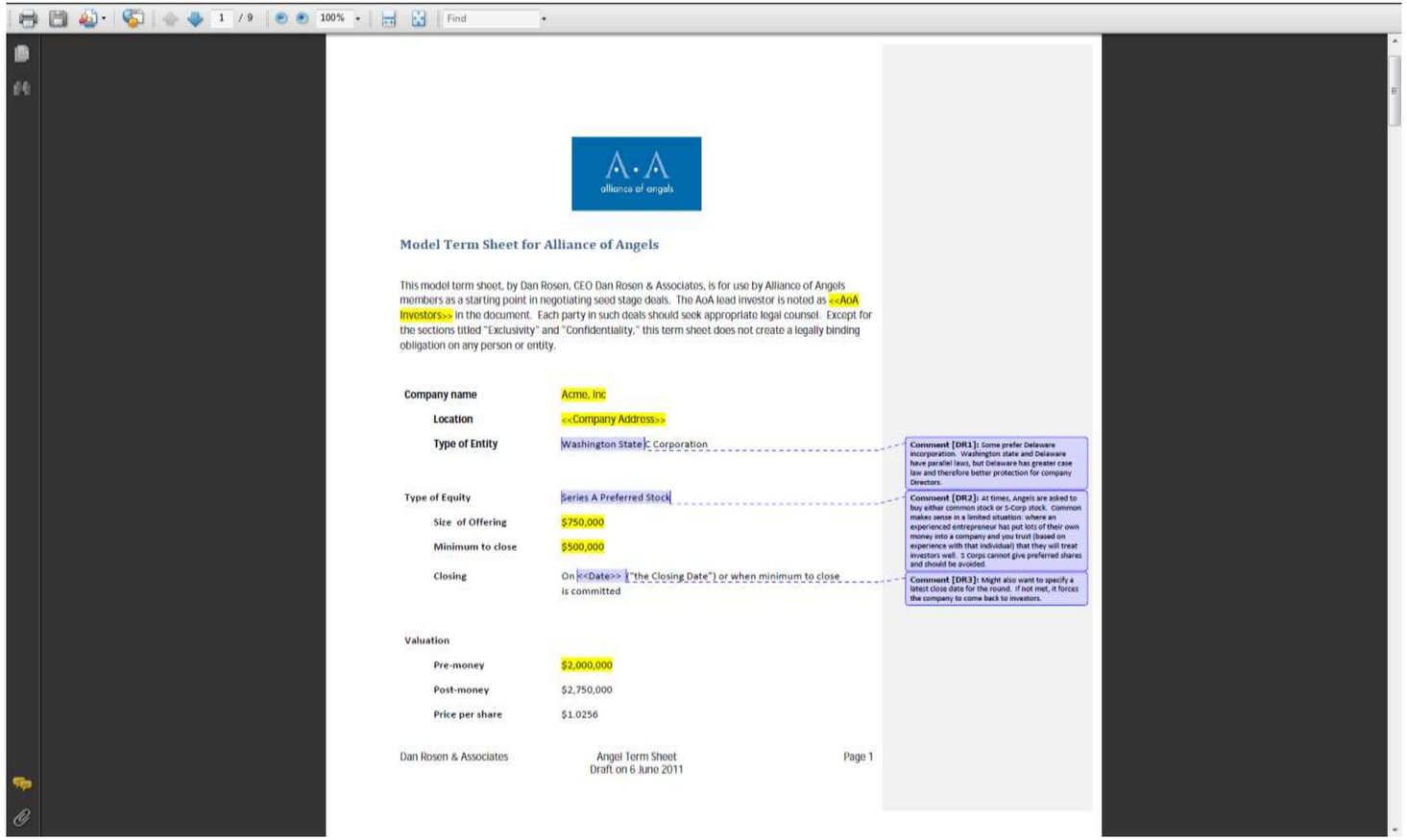
Preferred Stock

- Stock with certain special rights over common stock
- VC's usually invest by buying Participating Convertible Preferred Stock (convertible into Common)
  - Liquidation preference
  - Redemption
  - Optional conversion
  - Automatic conversion
  - Anti-dilution provisions
  - Pre-emptive rights
  - Registration rights
  - Board representation (usually)
  - Dividends
- These Preferences allow the investors to control the company



Some resources to learn more

http://www.angelcapitalassociation.org/data/Documents/Resources/1%20-%20Resources/Draft%20Term%20Sheet%20for%20Alliance%20of%20Angels.pdf



A·A
alliance of angels

Model Term Sheet for Alliance of Angels

This model term sheet, by Dan Rosen, CEO Dan Rosen & Associates, is for use by Alliance of Angels members as a starting point in negotiating seed stage deals. The AoA lead investor is noted as <<AoA Investors>> in the document. Each party in such deals should seek appropriate legal counsel. Except for the sections titled "Exclusivity" and "Confidentiality," this term sheet does not create a legally binding obligation on any person or entity.

Company name	Acme, Inc
Location	<<Company Address>>
Type of Entity	Washington State C Corporation
Type of Equity	Series A Preferred Stock
Size of Offering	$750,000
Minimum to close	$500,000
Closing	On <<Date>> ("the Closing Date") or when minimum to close is committed
Valuation	
Pre-money	$2,000,000
Post-money	$2,750,000
Price per share	$1.0256

Comment [DR1]: Some prefer Delaware incorporation. Washington state and Delaware have parallel laws, but Delaware has greater case law and therefore better protection for company Directors.

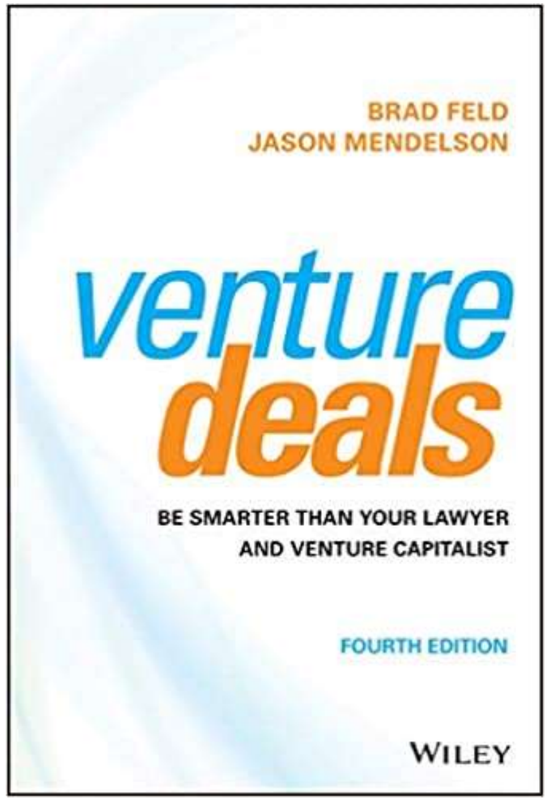
Comment [DR2]: At times, Angels are asked to buy either common stock or S-Corp stock. Common makes sense in a limited situation: where an experienced entrepreneur has put lots of their own money into a company and you trust (based on experience with that individual) that they will treat investors well. S Corps cannot give preferred shares and should be avoided.

Comment [DR3]: Might also want to specify a latest close date for the round. If not met, it forces the company to come back to investors.

Dan Rosen & Associates | Angel Term Sheet Draft on 6 June 2011 | Page 1

Some resources to learn more

Venture Deals: Be Smarter Than Your Lawyer and Venture Capitalist by Brad Feld and Jason Mendelson, John Wiley & Sons, Inc. August 2019; ~$30 from Amazon.



Definitions

Series A, Series B, Series C.....

- Successive rounds of Preferred Stock
- Series B usually has precedence over Series A, and so on

Fully Diluted

- Number of shares that will be issued and outstanding when all the options and warrants that have been issued are exercised

Series A Venture Round

- Need to raise $3 million
- Two funds put in $1.5 million each
- 1,000,000 pool of shares created for stock options for future management that will be hired with the proceeds from the financing
- Price $1.00 per share
  - Seed investors show a 25% profit
- Professor's stake now worth $500,000 (+25%)

Series A Venture Round

		Shares		Raised	%		Value
	Common		Series A		I&O	FD	
	Shares	Options					
Price per Share	$1.00						
Professor	500,000				8.7%	7.4%	$500,000
Postdoc A	250,000				4.3%	3.7%	$250,000
Postdoc B	250,000				4.3%	3.7%	$250,000
University	500,000				8.7%	7.4%	$500,000
CEO	1,000,000				17.4%	14.8%	$1,000,000
Seed investors	250,000				4.3%	3.7%	$250,000
Management Pool		1,000,000				14.8%	$1,000,000
VC Fund A			1,500,000	$1,500,000	26.1%	22.2%	$1,500,000
VC Fund B			1,500,000	$1,500,000	26.1%	22.2%	$1,500,000
Total	2,750,000	1,000,000	3,000,000	$3,000,000	100%	100%	$6,750,000

Issued & outstanding	5,750,000
Fully diluted	6,750,000
Raised in this round	$3,000,000
Cumulative raised	$3,225,000
Pre-Money	$3,750,000
Post-Money	$6,750,000

Series B Venture Round

- Need to raise $10 million
- $2.00 per share
  - Sell 5 million shares
- First two funds participate
- New fund leads the round
  - Under NVCA rules, the first two funds can report increased value for Series A investment
    - Helps raise the next fund
- Further increase in management option pool
  - Additional 1 million shares
- Professor's stake now worth $1 million
  - +100%

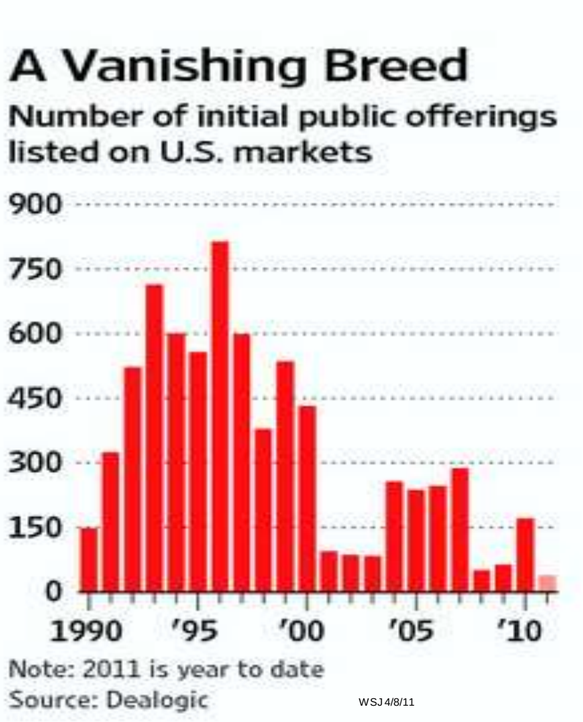
Series B Venture Round

Price per Share	$2.00							
	Shares				Raised	%		Value
	Common		Series A	Series B		I&O	FD	
	Shares	Options						
Professor	500,000					4.7%	3.9%	$1,000,000
Postdoc A	250,000					2.3%	2.0%	$500,000
Postdoc B	250,000					2.3%	2.0%	$500,000
University	500,000					4.7%	3.9%	$1,000,000
CEO	1,000,000					9.3%	7.8%	$2,000,000
Seed investors	250,000					2.3%	2.0%	$500,000
Management Pool		2,000,000					15.7%	$4,000,000
VC Fund A			1,500,000	1,500,000	$3,000,000	27.9%	23.5%	$6,000,000
VC Fund B			1,500,000	1,500,000	$3,000,000	27.9%	23.5%	$6,000,000
VC Fund C				2,000,000	$4,000,000	18.6%	15.7%	$4,000,000
Total	2,750,000	2,000,000	3,000,000	5,000,000	$10,000,000	100%	100%	$25,500,000

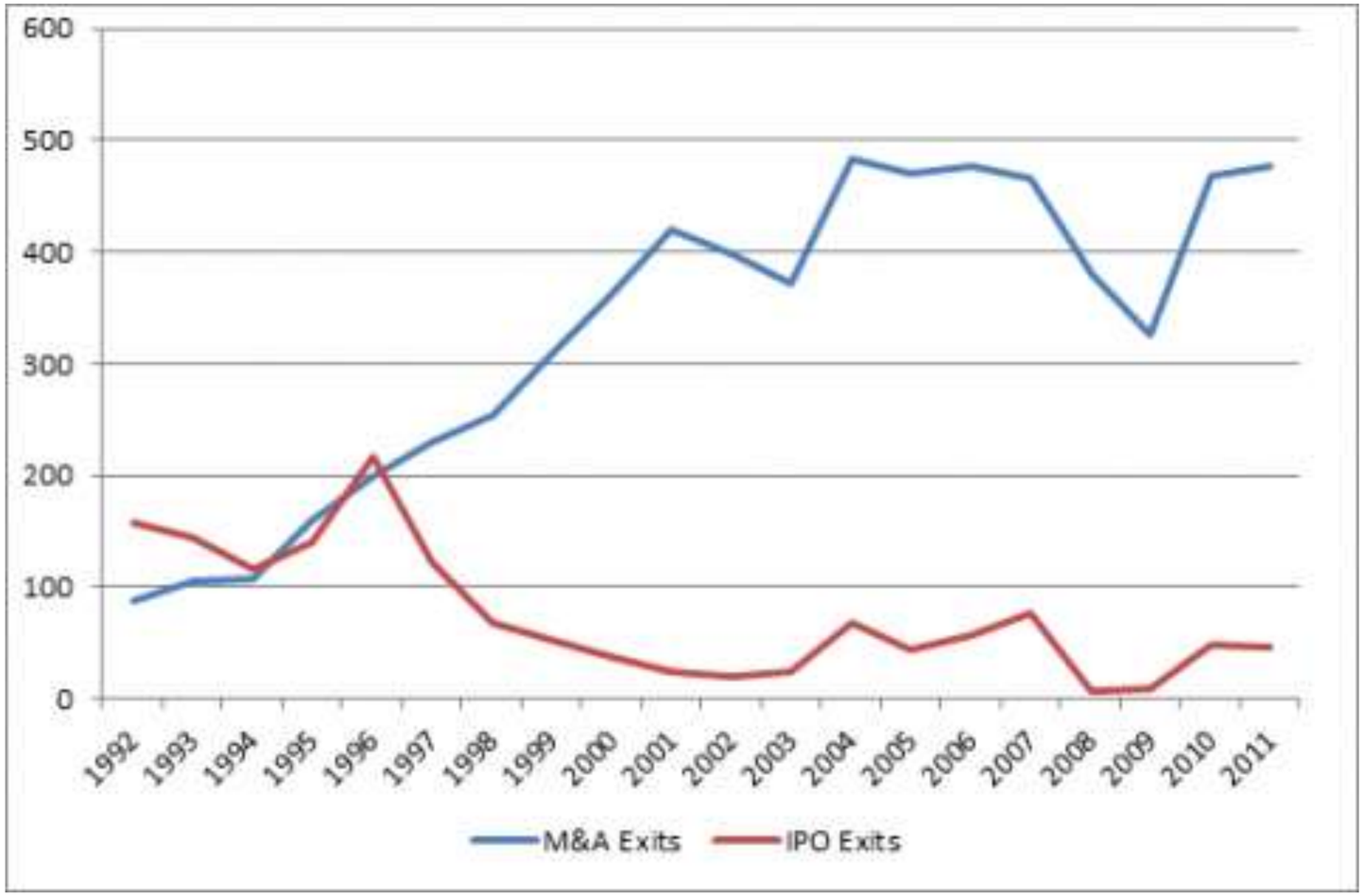
Issued and outstanding	10,750,000
Fully diluted	12,750,000
Raised in this round	$10,000,000
Cumulative raised	$13,225,000
Pre-Money	$15,500,000
Post-Money	$25,500,000

The Exit

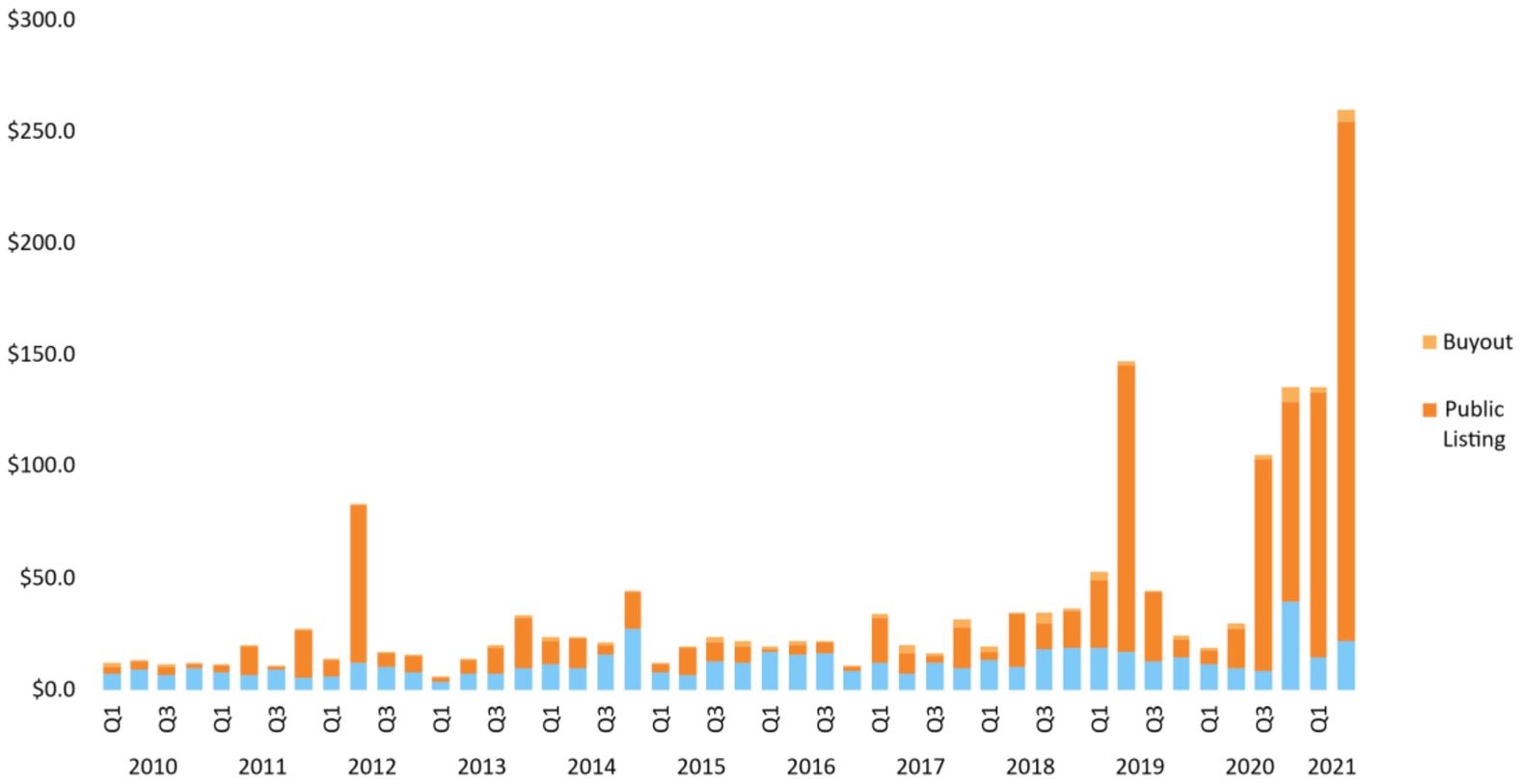
- IPO
- Acquisition
  - Cash
  - Stock
    - Publicly traded
    - Privately held



The Exit

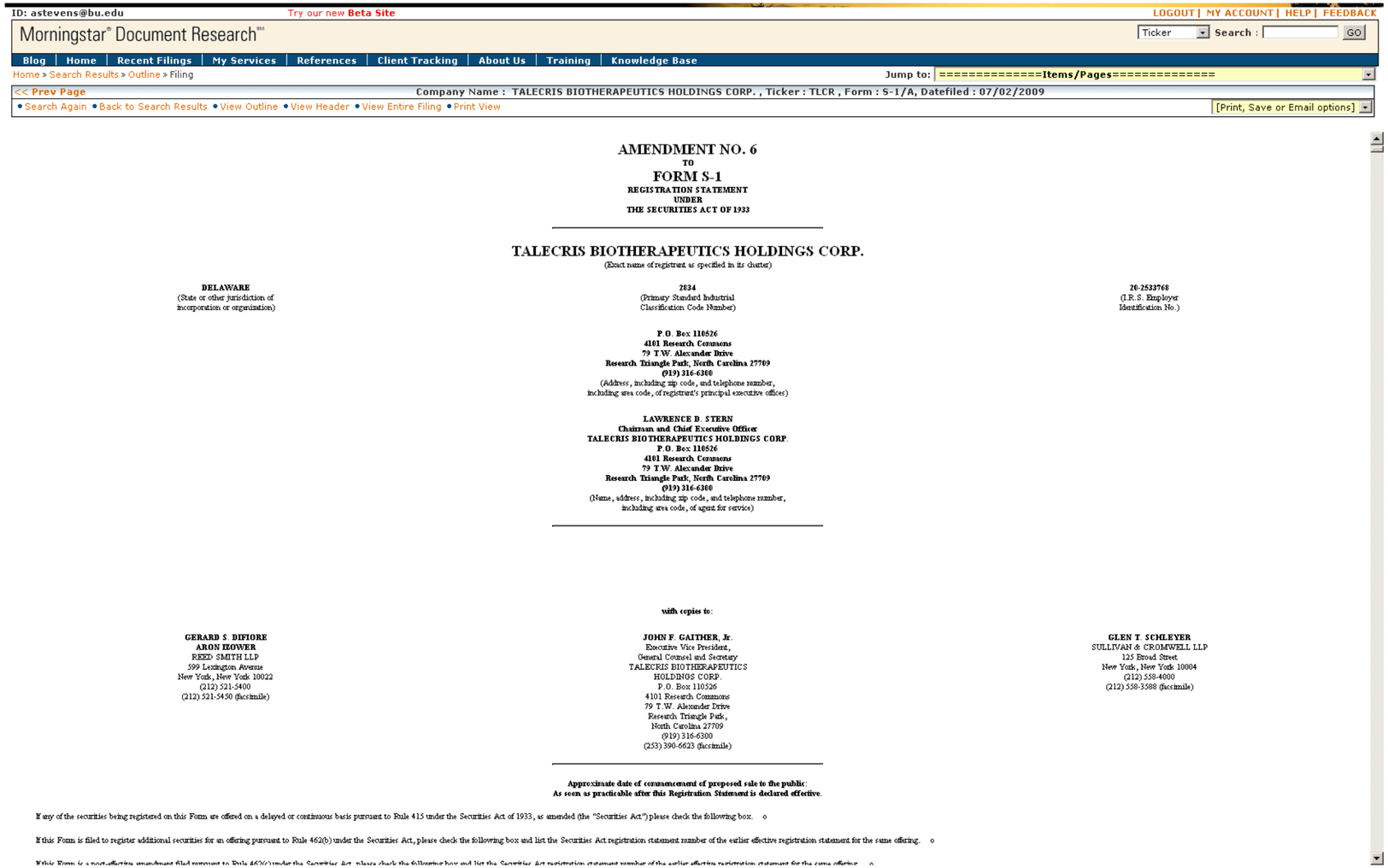


The Exit



Initial Public Offering

- Company is ready to sell stock to the public
- Sells 8 million shares to the public at $8.00 per share
- Professor’s stake now worth $4,000,000
  - +300%



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AMENDMENT NO. 6
TO
FORM S-1
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

TALECRIS BIOTHERAPEUTICS HOLDINGS CORP.
(Exact name of registrant as specified in its charter)

DELAWARE	**2834**	**20-2533768**
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification No.)

P.O. Box 110526
4101 Research Commons
79 T.W. Alexander Drive
Research Triangle Park, North Carolina 27709
(919) 316-6300
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

LAWRENCE D. STERN
Chairman and Chief Executive Officer
TALECRIS BIOTHERAPEUTICS HOLDINGS CORP.
P.O. Box 110526
4101 Research Commons
79 T.W. Alexander Drive
Research Triangle Park, North Carolina 27709
(919) 316-6300
(Name, address, including zip code, and telephone number, including area code, of agent for service)

---

with copies to:

GERARD S. DIFIORE **ARON IZOWER** REED SMITH LLP 599 Lexington Avenue New York, New York 10022 (212) 521-5400 (212) 521-5450 (facsimile)	**JOHN F. GAITHER, Jr.** Executive Vice President, General Counsel and Secretary TALECRIS BIOTHERAPEUTICS HOLDINGS CORP. P.O. Box 110526 4101 Research Commons 79 T.W. Alexander Drive Research Triangle Park, North Carolina 27709 (919) 316-6300 (253) 390-6623 (facsimile)	**GLEN T. SCHLEYER** SULLIVAN & CROMWELL LLP 125 Broad Street New York, New York 10004 (212) 558-4000 (212) 558-3588 (facsimile)

Approximate date of commencement of proposed sale to the public:
As soon as practicable after this Registration Statement is declared effective.

If any of the securities being registered on this Form are offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, as amended (the "Securities Act") please check the following box. o

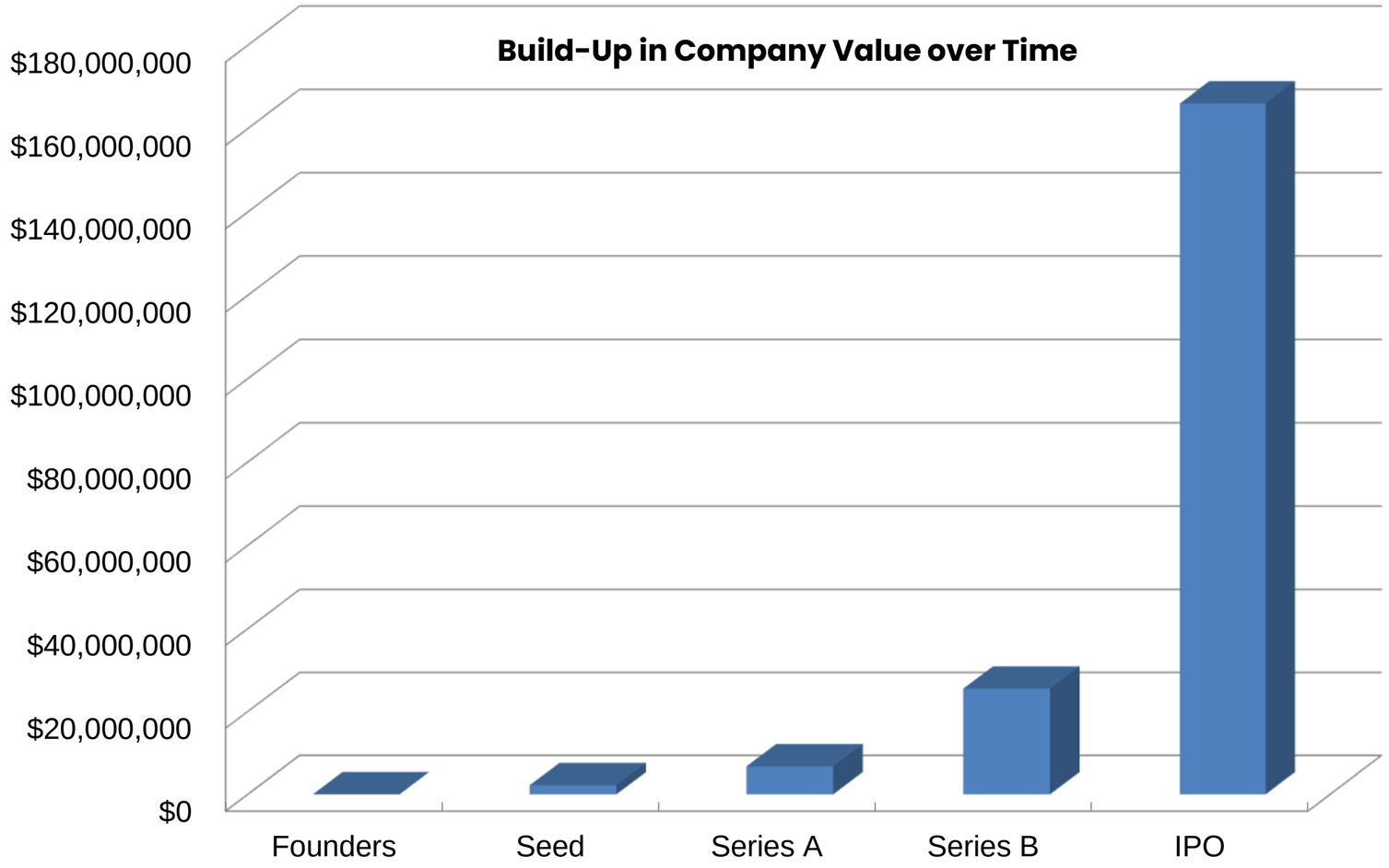
If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. o

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. o

IPO

Price per Share	**$8.00**				
	Shares Common Shares	**Raised**	**% I&O**	**% FD**	**Value**
Professor	500,000		2.4%	2.4%	$4,000,000
Postdoc A	250,000		1.2%	1.2%	$2,000,000
Postdoc B	250,000		1.2%	1.2%	$2,000,000
University	500,000		2.4%	2.4%	$4,000,000
CEO	1,000,000		4.8%	4.8%	$8,000,000
Seed investors	250,000		1.2%	1.2%	$2,000,000
Management Pool	2,000,000		9.6%	9.6%	$16,000,000
VC Fund A	3,000,000		14.5%	14.5%	$24,000,000
VC Fund B	3,000,000		14.5%	14.5%	$24,000,000
VC Fund C	2,000,000		9.6%	9.6%	$16,000,000
Public Investors	8,000,000	$64,000,000	38.6%	38.6%	$64,000,000
Total	20,750,000	$64,000,000	100%	100%	$166,000,000

Issued & outstanding	20,750,000
Fully diluted	20,750,000
Raised in this round	$64,000,000
Cumulative raised	$77,225,000
Pre-Money	$102,000,000
Post-Money	$166,000,000



Definitions

Registered Stock

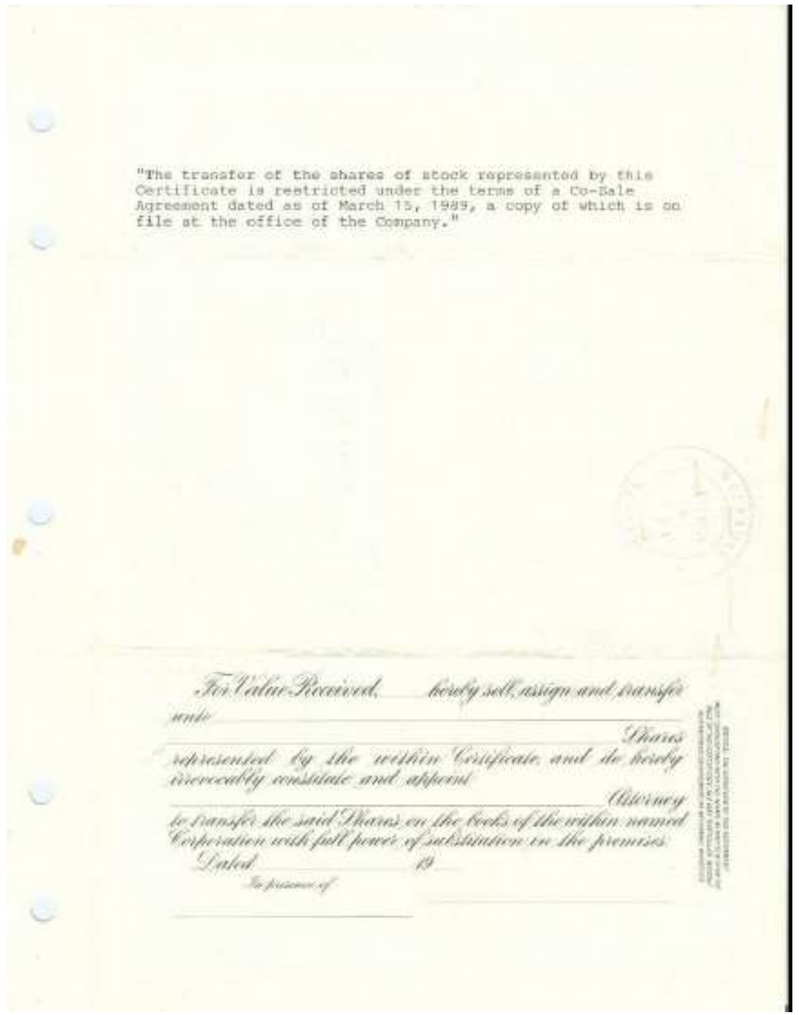
Stock that has been issued under a registration statement approved by the SEC and can be freely sold to the public

Unregistered Stock

Stock that has been sold not in connection with a registration statement approved by the SEC; cannot be sold in the public markets

Life After the IPO

- Can’t immediately sell stock
- Underwriters will normally impose a 180 day lock-up on all pre-IPO stock
  - Once saw a European IPO with a 1 year lock-up
- Remaining stock needs to be registered to sell
  - Can sell limited amounts under Rule 144



"The transfer of the shares of stock represented by this Certificate is restricted under the terms of a Co-Sale Agreement dated as of March 15, 1989, a copy of which is on file at the office of the Company."

For Value Received, hereby sell, assign and transfer unto

Shares represented by the within Certificate, and do hereby irrevocably constitute and appoint

Attorney to transfer the said Shares on the books of the within named Corporation with full power of substitution in the premises.

Dated 19

In presence of

The Dark Side – Things Go Wrong

- Company does not meet its milestones for Series B financing
- Series B price is $0.60 per share, not $2.00 per share
  - A “Down Round”
  - Can’t bring in Fund C
    - Only existing investors will participate
- Now needs $11 million to get to IPO
  - $1 million to get back on track
  - $10 million to go to market
- Has to sell 18,333,333 shares to raise $11 million, not 2,000,000 shares
- Professors stake now worth $300,000
  - Down 33% (vs up 400% in happy scenario)
- Major shift in ownership from common to preferred

Series B Venture Round

Price per Share	$0.60							
	Shares				Raised	%		Value
	Common Shares	Options	Series A	Series B		I&O	FD	
Professor	500,000					2.2%	2.0%	$300,000
Postdoc A	250,000					1.1%	1.0%	$150,000
Postdoc B	250,000					1.1%	1.0%	$150,000
University	500,000					2.2%	2.0%	$300,000
CEO	1,000,000					4.3%	4.0%	$600,000
Seed investors	250,000					1.1%	1.0%	$150,000
Management Pool		2,000,000					8.0%	$1,200,000
VC Fund A			1,000,000	9,166,667	$ 5,500,000	44.0%	40.5%	$6,100,000
VC Fund B			1,000,000	9,166,667	$ 5,500,000	44.0%	40.5%	$6,100,000
Total	2,750,000	2,000,000	2,000,000	18,333,333	$ 11,000,000	100%	100%	$15,050,000

Issued $ outstanding	23,083,333
Fully diluted	25,083,333
Raised in this round	$11,000,000
Cumulative raised	$14,225,000
Pre-Money	$4,050,000
Post-Money	$15,050,000

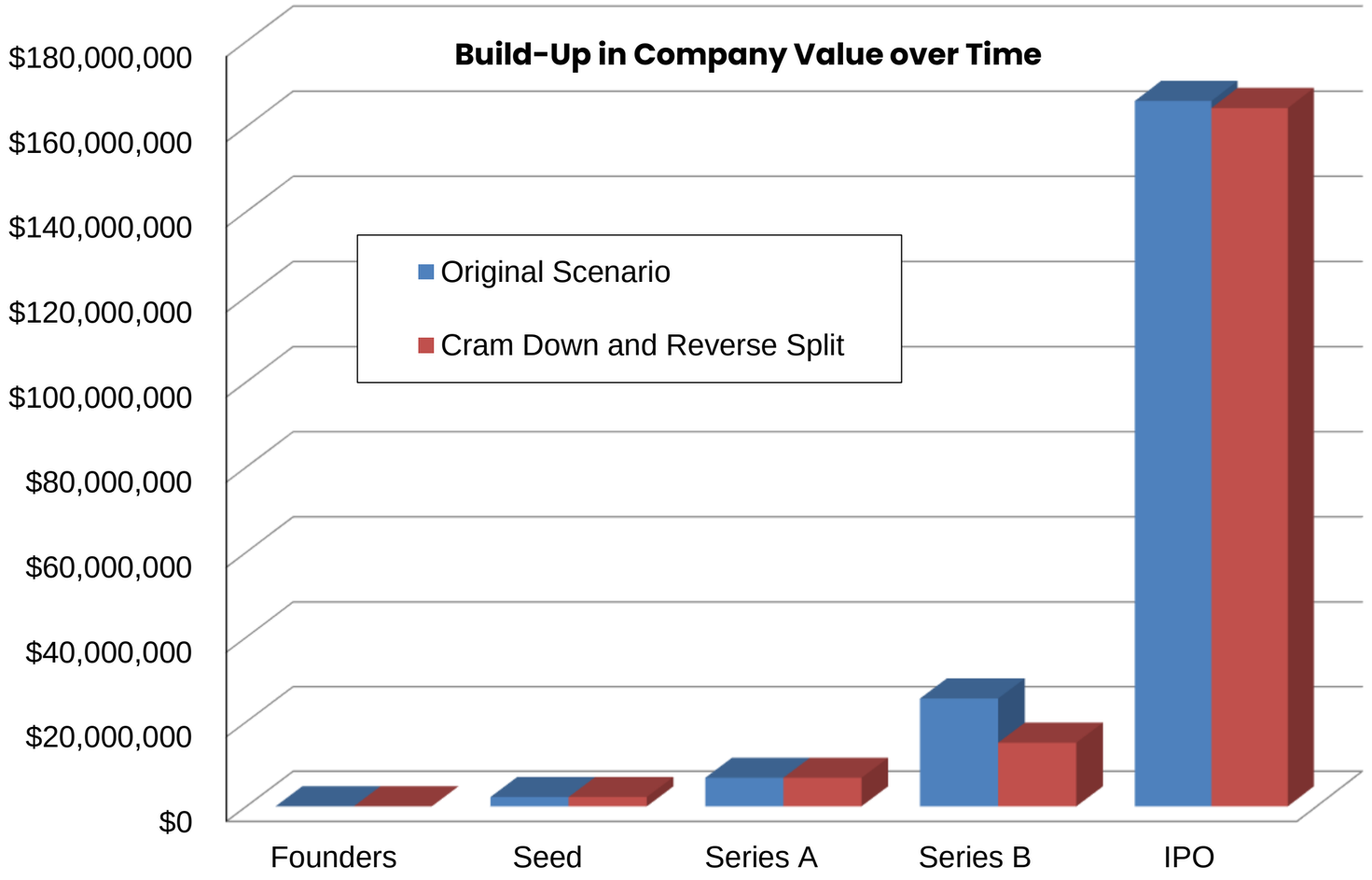
IPO with Reverse Split

- Because of Cram Down, investment bankers may decide Company needs to reduce number of shares outstanding
  - 25,083,333 FD shares vs. 12,750,000
- Reverse split, 1 for 2
  - Gets back close to 13,000,000 shares
- Professor's stake now worth $2,000,000, +667%

Example:

- Acusphere (MIT / Langer) did Series A, B, C, D, E, F, G, H, I and J financings!
  - Founded 1993
  - Perflubutane polymer microspheres for detection of coronary artery disease
    - Never got anything approved anywhere
- 1 for 10 reverse split prior to IPO
  - $14/share, 2003
  - And it did **ANOTHER** 1 for 10 reverse split in 2012
    - Seems to finally have quietly died in 2012 – 19 years!

Price per Share	**$8.00**					
Reverse Split	**1 for 2**				**Original Scenario**	
	Shares Common Shares	**Raised**	**% I&O**	**Value**	**Value**	**Diff**
Professor	250,000		1.2%	$2,000,000	$4,000,000	($2,000,000)
Postdoc A	125,000		0.6%	$1,000,000	$2,000,000	($1,000,000)
Postdoc B	125,000		0.6%	$1,000,000	$2,000,000	($1,000,000)
University	250,000		1.2%	$2,000,000	$4,000,000	($2,000,000)
CEO	500,000		2.4%	$4,000,000	$8,000,000	($4,000,000)
Seed investors	125,000		0.6%	$1,000,000	$2,000,000	($1,000,000)
Management Pool	1,000,000		4.9%	$8,000,000	$16,000,000	($8,000,000)
VC Fund A	5,083,333		24.7%	$40,666,667	$24,000,000	$16,666,667
VC Fund B	5,083,333		24.7%	$40,666,667	$24,000,000	$16,666,667
VC Fund C					$16,000,000	($16,000,000)
Public Investors	8,000,000	$64,000,000	38.9%	$64,000,000	$64,000,000	$0
Total	20,541,667	$64,000,000	100%	$164,333,333	$166,000,000	($1,666,667)
Issued & outstanding	20,541,667				$20,750,000	($208,333)
Fully diluted	20,541,667				$20,750,000	($208,333)
Raised in this round	$64,000,000				$64,000,000	$0
Cumulative raised	$78,225,000				$77,210,000	$1,000,000
Pre-Money	$100,333,333				$102,000,000	($1,666,667)
Post-Money	$164,333,333				$166,000,000	($1,666,667)



Acquisition

- The alternative to IPO
- Benefit
  - Immediate liquidity
- The Dark Side
  - From the Entrepreneurs' and Managements' perspectives
  - Liquidation Preferences

Definition

Liquidation Preference

- Payment received by preferred stock holder on liquidation or acquisition of the company
  - Usually at least equal to the original investment
  - Can be multiples of the original investment

Participating Preferred Stock

- After payment of the preferences, remaining funds are distributed *pro rata* to **ALL** shareholders
  - Including preferred
  - A double dip
    - VC's love acquisitions

Acquisition with Liquidation Preferences

Acquisition Price	$91,800,000			
Per share	$7.2			
Liquid. Pref.				Price
Series A	1	x	$	1.00
Series B	1	x	$	2.00

	Shares				%			Proceeds				
	Common		Series A	Series B	I&O	FD	Preferences	Balance	Total	IPO	D	%
	Shares	Options										
Professor	500,000				4.7%	3.9%		$3,090,196	$3,090,196	$4,000,000	($909,804)	77.3%
Postdoc A	250,000				2.3%	2.0%		$1,545,098	$1,545,098	$2,000,000	($454,902)	77.3%
Postdoc B	250,000				2.3%	2.0%		$1,545,098	$1,545,098	$2,000,000	($454,902)	77.3%
University	500,000				4.7%	3.9%		$3,090,196	$3,090,196	$4,000,000	($909,804)	77.3%
CEO	1,000,000				9.3%	7.8%		$6,180,392	$6,180,392	$8,000,000	($1,819,608)	77.3%
Seed investors	250,000				2.3%	2.0%		$1,545,098	$1,545,098	$2,000,000	($454,902)	77.3%
Mgmt Pool		2,000,000				15.7%		$12,360,784	$12,360,784	$16,000,000	($3,639,216)	77.3%
VC Fund A			1,500,000	1,500,000	27.9%	23.5%	$4,500,000	$18,541,176	$23,041,176	$24,000,000	($958,824)	96.0%
VC Fund B			1,500,000	1,500,000	27.9%	23.5%	$4,500,000	$18,541,176	$23,041,176	$24,000,000	($958,824)	96.0%
VC Fund C				2,000,000	18.6%	15.7%	$4,000,000	$12,360,784	$16,360,784	$16,000,000	$360,784	102.3%
Total	2,750,000	2,000,000	3,000,000	5,000,000	100%	100%	$13,000,000	$78,800,000	$91,800,000	$102,000,000	($10,200,000)	90.0%

Issued & Outstanding	10,750,000
Fully Diluted	12,750,000

Acquisition with Liquidation Preferences after Cram Down

Acquisition Price	$91,800,000			
Per share	$7.2			
Liquidation Preferences				
Series A	1	x	$	1.00
Series B	3	x	$	0.60

	Shares				%			Proceeds				
	Common Shares	Options	Series A	Series B	I&O	FD	Preferences	Balance	Total	Base Case	D	%
Professor A	500,000				2.2%	2.0%		$1,132,226	$1,132,226	$3,090,196	($1,957,970)	36.6%
Postdoc B	250,000				1.1%	1.0%		$566,113	$566,113	$1,545,098	($978,985)	36.6%
Postdoc C	250,000				1.1%	1.0%		$566,113	$566,113	$1,545,098	($978,985)	36.6%
University	500,000				2.2%	2.0%		$1,132,226	$1,132,226	$3,090,196	($1,957,970)	36.6%
CEO	1,000,000				4.3%	4.0%		$2,264,452	$2,264,452	$6,180,392	($3,915,940)	36.6%
Seed investors	250,000				1.1%	1.0%		$566,113	$566,113	$1,545,098	($978,985)	36.6%
Management Pool		2,000,000				8.0%		$4,528,904	$4,528,904	$12,360,784	($7,831,881)	36.6%
VC Fund A			1,000,000	9,166,667	44.0%	40.5%	$17,500,000	$23,021,927	$40,521,927	$23,041,176	$17,480,750	175.9%
VC Fund B			1,000,000	9,166,667	44.0%	40.5%	$17,500,000	$23,021,927	$40,521,927	$23,041,176	$17,480,750	175.9%
VC Fund C										$16,360,784	($16,360,784)	
Total	2,750,000	2,000,000	2,000,000	18,333,333	100%	100%	$35,000,000	$56,800,000	$91,800,000	$91,800,000	$0	100.0%

Issued and outstanding	23,083,333
Fully diluted	25,083,333

Non-Dilutive Funding

- There are great benefits to founders and management if grants can be used to fund early stage development
  - Instead of investment capital
- Sources:
  - SBIR's
  - Other Federal sources
  - Corporate partners
  - Philanthropies
- This is referred to as "Non-Dilutive Funding" because NewCo doesn't have to issue stock to get the money
  - No dilution to existing shareholders

Non-Dilutive Funding

- Assume that our NewCo can get grants to replace its Series A investment
- Analytical approach:
  - Eliminate Series A shares from Cap Table
    - Results in lower Pre-Money for Series B
  - But company is at same stage of development
    - Therefore it should have same pre-money valuation for Series B
  - Using Goal Seek, set Pre-Money to $15.5 million by varying Share Price
    - Share Price increases from $2.00 to $3.26 / share
      - At the higher price, fewer shares have to be sold in Series B
        - 3.1 million vs 5 million
        - Even less dilution to existing shareholders
    - Founders', Managements and Seed Investors' stakes increase in value by ~63%
      - VC's make less but have invested less

Series B Round With Non-Dilutive Funding Instead of Series A

Price per Share	$3.26									With Series A			
	Shares				Raised	%		Value		%		Value	Δ
	Common		Series A	Series B		I&O	FD			I&O	FD		
	Shares	Options											
Professor	500,000					8.6%	6.4%	$1,631,579		4.7%	3.9%	$1,000,000	$631,579
Postdoc A	250,000					4.3%	3.2%	$815,789		2.3%	2.0%	$500,000	$315,789
Postdoc B	250,000					4.3%	3.2%	$815,789		2.3%	2.0%	$500,000	$315,789
University	500,000					8.6%	6.4%	$1,631,579		4.7%	3.9%	$1,000,000	$631,579
CEO	1,000,000					17.2%	12.8%	$3,263,158		9.3%	7.8%	$2,000,000	$1,263,158
Seed investors	250,000					4.3%	3.2%	$815,789		2.3%	2.0%	$500,000	$315,789
Management Pool		2,000,000					25.6%	$6,526,316			15.7%	$4,000,000	$2,526,316
VC Fund A				919,355	$3,000,000	15.8%	11.8%	$3,000,000		27.9%	23.5%	$6,000,000	($3,000,000)
VC Fund B				919,355	$3,000,000	15.8%	11.8%	$3,000,000		27.9%	23.5%	$6,000,000	($3,000,000)
VC Fund C				1,225,806	$4,000,000	21.1%	15.7%	$4,000,000		18.6%	15.7%	$4,000,000	$0
Total	2,750,000	2,000,000	0	3,064,516	$10,000,000	100%	100%	$25,500,000				$25,500,000	
Issued and outstanding	5,814,516												
Fully diluted	7,814,516												
Raised in this round	$10,000,000												
Cumulative raised	$13,225,000												
Pre-Money	$15,500,000												
Post-Money	$25,500,000												

Non-Dilutive Funding

- Company is now ready for IPO
- No Series A and lower number of Series B shares results in lower pre-money
  - Again, company is at the same stage and so should be worth the same
  - Using Goal Seek, set Pre-Money to $102 million by varying the Share Price
    - Share Price increases from $8.00 to $13.05 / share
  - Company no longer needs to sell 8 million shares to raise $64 million
    - Only needs to sell 4.9 million shares
  - Founders', Management's and Seed Investors' stakes increase in value by ~63%
    - VC's make less but have invested less

IPO With Non-Dilutive Funding Instead of Series A

Price per Share	$13.05							With Series A		
	Shares	Raised	%		Value		%		Value	Δ
	Common Shares		I&O	FD			I&O	FD		
Professor	500,000		3.9%	3.9%	$6,526,316		2.4%	2.4%	$4,000,000	$2,526,316
Postdoc A	250,000		2.0%	2.0%	$3,263,158		1.2%	1.2%	$2,000,000	$1,263,158
Postdoc B	250,000		2.0%	2.0%	$3,263,158		1.2%	1.2%	$2,000,000	$1,263,158
University	500,000		3.9%	3.9%	$6,526,316		2.4%	2.4%	$4,000,000	$2,526,316
CEO	1,000,000		7.9%	7.9%	$13,052,632		4.8%	4.8%	$8,000,000	$5,052,632
Seed investors	250,000		2.0%	2.0%	$3,263,158		1.2%	1.2%	$2,000,000	$1,263,158
Management Pool	2,000,000		15.7%	15.7%	$26,105,263		9.6%	9.6%	$16,000,000	$10,105,263
VC Fund A	919,355		7.2%	7.2%	$12,000,000		14.5%	14.5%	$24,000,000	($12,000,000)
VC Fund B	919,355		7.2%	7.2%	$12,000,000		14.5%	14.5%	$24,000,000	($12,000,000)
VC Fund C	1,225,806		9.6%	9.6%	$16,000,000		9.6%	9.6%	$16,000,000	$0
Public Investors	4,903,226	$64,000,000	38.6%	38.6%	$64,000,000		38.6%	38.6%	$64,000,000	$0
Total	12,717,742	$64,000,000	100%	100%	$166,000,000		100%	100%	$166,000,000	
Issued and outstanding	12,717,742									
Fully diluted	12,717,742									
Raised in this round	$64,000,000									
Cumulative raised	$77,225,000									
Pre-Money	$102,000,000									
Post-Money	$166,000,000									

How Do You Know What to Sell a Company for?

- Two main bases for high tech companies
- If public, market cap plus a premium

- If private -- **X**
  i.e., X times its sales
- Every industry has its “X”
  - Find three or four recent transactions in the same space and calculate
- Pharmaceuticals:
  - X=5
    - E.g., Genzyme’s sales were $4 billion
      - Sanofi paid $20 billion

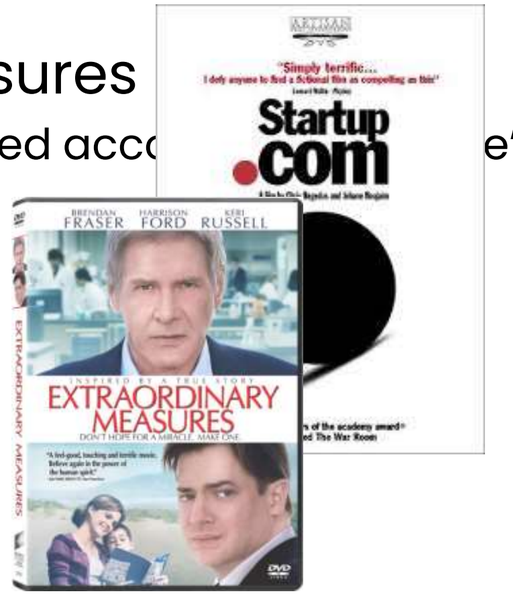
And if this is all too complicated……

- Don’t bother to take equity at all
  - Who cares about owning stock?
    - What we really want is to be able to sell the stock
  - So ask for an Exit Fee instead
  - Paid if:
    - Change of control (acquisition)
    - IPO
  - 1 – 3% of amount raised (acquisition) / pre-money value (IPO)
- Benefits:
  - Simpler, cleaner
  - May help with CoI
  - No issues of Board representation
- Examples:
  - NIH
  - U. of Kansa Swift Startup License (kuic.ku.edu/swift-startup-license)

Two Great Movies About Start-Ups

- Startup.com
  - Two guys start a dot.com. Filmed in real time as it was happening
  - Truly ugly buy-out of a vested founder who didn't join the company
    - Plus a whole lot of other highly emotional stuff

- Extraordinary Measures
  - The very thinly disguised acco e's development of Lumizyme. Harrison Ford



For More Information

- *The Art of the Cap Table* Ashley Stevens, *Journal of Commercial Biotechnology* (2012) 18, 83–97. doi: 10.5912/jcb.522;
  - The spreadsheet that this talk and the article were based on.
- *Intellectual Property Valuation Manual For Academic Institutions*
  - Ashley J. Stevens
  - World Intellectual Property Organization (WIPO), Geneva, Switzerland, March 2016,
  - available at: http://www.wipo.int/meetings/en/doc_details.jsp?doc_id=332588

Thank you for listening.

Questions?

astevens@bu.edu

University-Linked Venture Funds – UK

- IP Group did small funds with multiple universities
- Oxford Science Enterprises
  - £600 million first fund
  - £250 million second fund
- Cambridge Innovation Capital
  - £500 million
- UCL Technology Fund
  - £54 million
  - Raising £250 million
- Northern Gritstone
  - Manchester / Leeds / Sheffield
  - Raising £500 million
- CRUK
  - Sixth Element, managed by Syncopa
    - £54 million

University-Linked Venture Funds – UK

- Australia
  - Tin Valley Ventures Fund – U. of Melbourne
  - Uniseed – U. of Melbourne, Queensland, NSW, Sydney and CSIRO
    - Largely their own money

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

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