VENTURE VALUATION

How to value a Biotech Start-up company

May 2018 | London, BIOTECH INVESTMENT SHOWCASE

Agenda

VENTURE VALUATION

1. Overview of valuation
2. Valuation of a therapeutic Biotech product
3. Conclusion and Q&A

Company

VENTURE VALUATION

Mission	Independent assessment and valuation of technology driven companies / products in growth industries
	Biotechgate / Life Sciences Database
Offices	HQ: Zurich with representative offices in Europe, North America and Asia
Employees	30 people in Switzerland / UK / Ireland / Canada / USA Singapore / India / China
Clients	Pharma, Biotech and Investors such as Novartis Venture Fund, GSK, European Investment Bank, 4SC, Arpida/Evolva, Celtic Pharma Biotech Associations / Governments like Ausbiotech, CLSA, SwedenBio, BIOTECanada, Maryland

Value vs. Price

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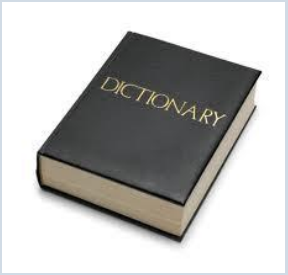

- **Value:** implies the inherent worth of a specific thing
- **Price:** depending on the market (supply / demand); whatever somebody is prepared to pay

“Price is what you pay. Value is what you get.“

By Warren Buffett

=> Provide basis for negotiation, investment decision, licensing deal

Why Valuation

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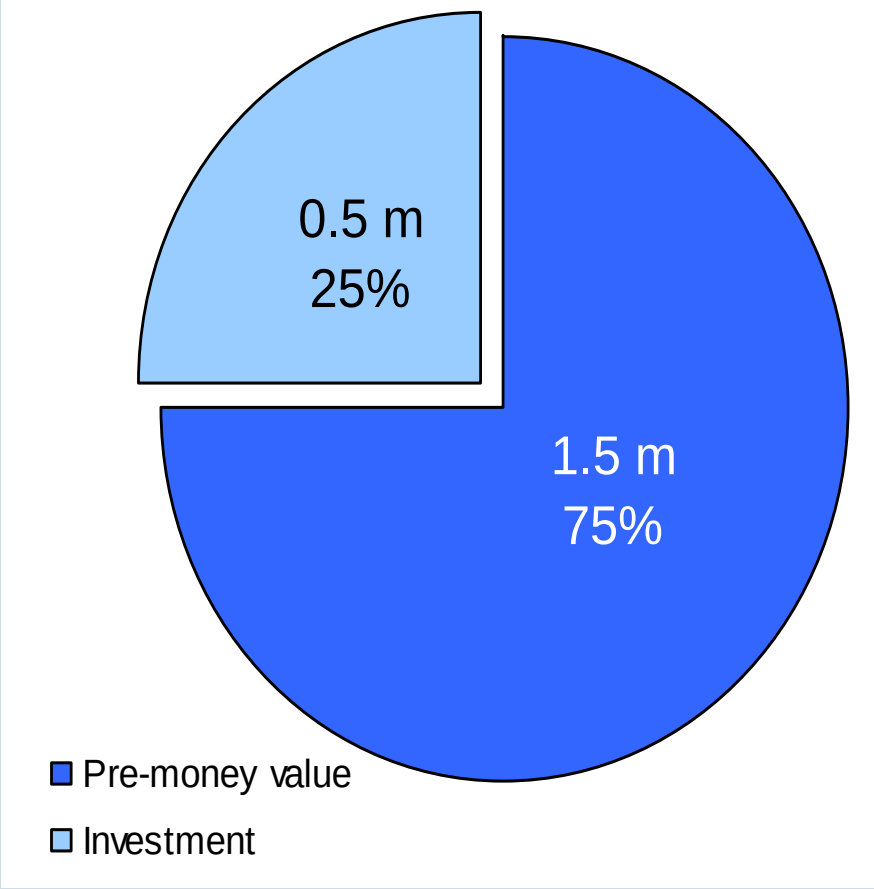
- Value before investment (pre - money value): EUR 1,5 m
- Investment: EUR 0,5 m
- Value after investment (post-money value): EUR 2,0 m
- Share Investor: 0,5 m / 2 m = 25%



Why Valuation

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- Out-licensing of a phase II product
- Deal terms:

up-front	CHF	1 m
milestones	CHF	20 m
royalties		7%

- rNPV of product ?
- rNPV of deal ?

⇒ rNPV of product: CHF 30 m

⇒ rNPV of deal: CHF 10 m

⇒ Split Biotech / Pharma: 33% / 66%

rNPV: risk adjusted net present value

VENTURE VALUATION

1. Overview of valuation
2. **Valuation of a therapeutic Biotech product**
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rNPV Valuation

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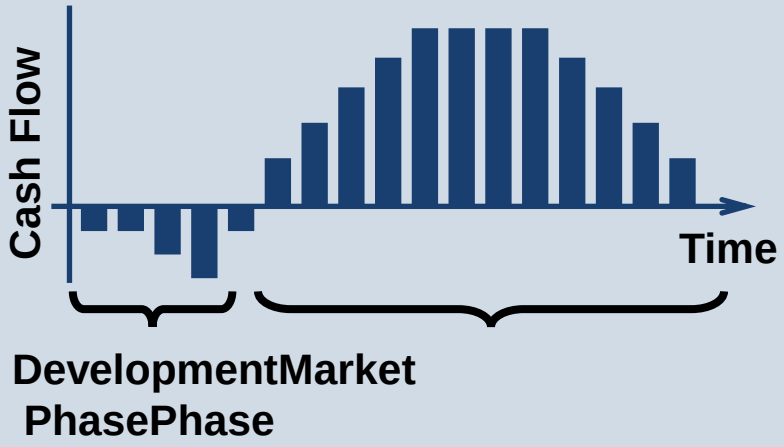
1. Development phase => investment
   Product Risk (r) => success rate or attrition rate

2. Market phase => revenues
   Patent expiry => end of revenues
   (often no terminal value)

3. Discount => non-specific risk (General Risk)



Five Step Process

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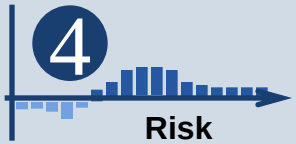
Determine Cash Flows in **Development** Phase

Determine Cash Flows in **Market** Phase

Discount with **Discount rate**



Adjust for **Risk**

Sum cash flows

rNPV – Example

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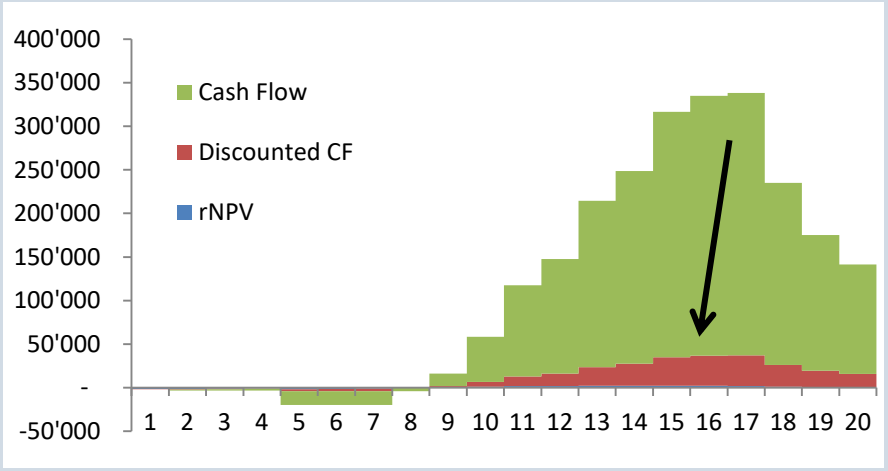
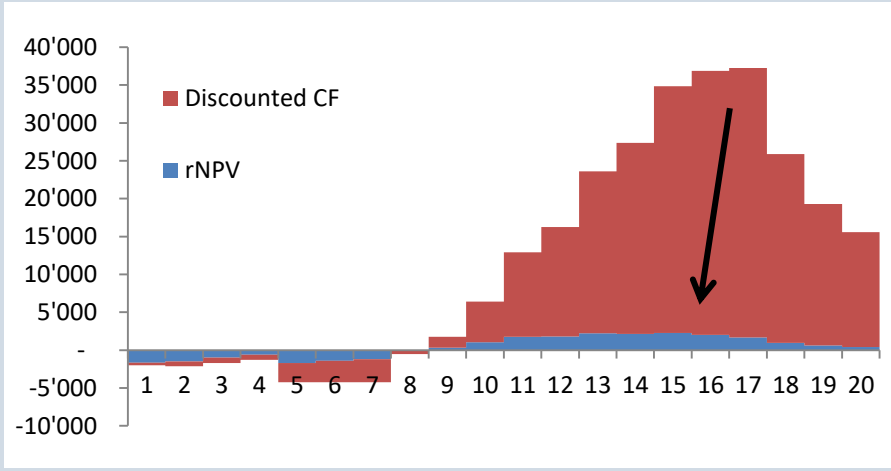
- Phase 1 product
- 20% discount rate
- 11% Probability of success (p1 to market)

⇒ CF: USD 2’269m

⇒ DCF: USD 127m

⇒ rNPV: USD 8m





Example Trial Inputs

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In US$ 000's	Phase I	Phase II	Phase III	Approval
Time (Years)	1	2	3	1
Number of Patients	~10	~200	~3000	
Cost per patient	7	7	7	
Total Patient costs	70	1400	21000	
Total patient costs as percentage of total costs*	30%	30%	30%	
Total non-patient costs	163	3267	49000	
Total costs	233	4667	70000	2500
Total Development Costs (unadjusted)				77400

* To factor in other cost including animal studies, manufacturing, administration etc.

Market Phase

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Develop assumptions to predict the future market

Methods used:

- Bottom-up approach
  - Based on primary market data

- Top-down approach
  - based on comparable products

Product Life Cycle

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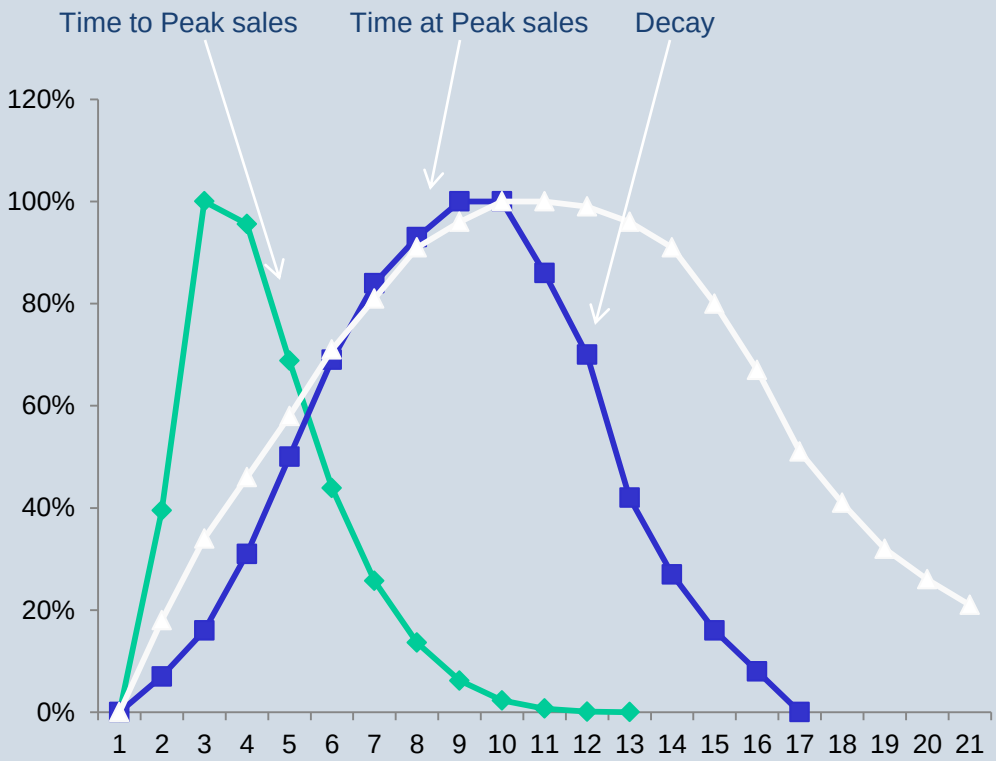

A. Define Growth Phase (4-8 years)
B. Define Mature Phase (1-4 years)
C. Define Decay Phase (7-10 years)

Bottom up approach

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Sales Forecast

Western EU		2018	2019
Population (000's)		300'000	306'000
Incidence rate (%)	0.020%	60.000	61.200
Diagnosed population	70%	42.000	42.840
Population treated with drugs	80%	33.600	34.272
Compliance rate	90%	30.240	30.845
Addressable population		30.240	30.845
Market penetration rate (%)		18%	34%
Patient population		5.443	10.487
Market share	12%		
Price (EUR)	2000		
Sales Western EU (EUR 000's)		**1'306**	**2'517**
USA Sales		**2'540**	**4'798**
Japan Sales		**392**	**755**
Rest of the World (RoW) Sales		**1'270**	**2'399**
Total sales (EUR 000's)		**5'508**	**10'469**

Peak Sales		Value
USD 1bn	=>	USD 8m
USD 0.7bn	=>	USD 3m
USD 2bn	=>	USD 25m

Discount rate

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Used discount rate in rNPV:

- Early stage 12% - 28%
- Mid stage 10% - 22%
- Late stage 9% - 20%

Source. www.biostrat.dk

Cost of equity and non-development associated risks.

20% => USD 8m
25% => USD 2m
15% => USD 21m

Adjust for risk (I)

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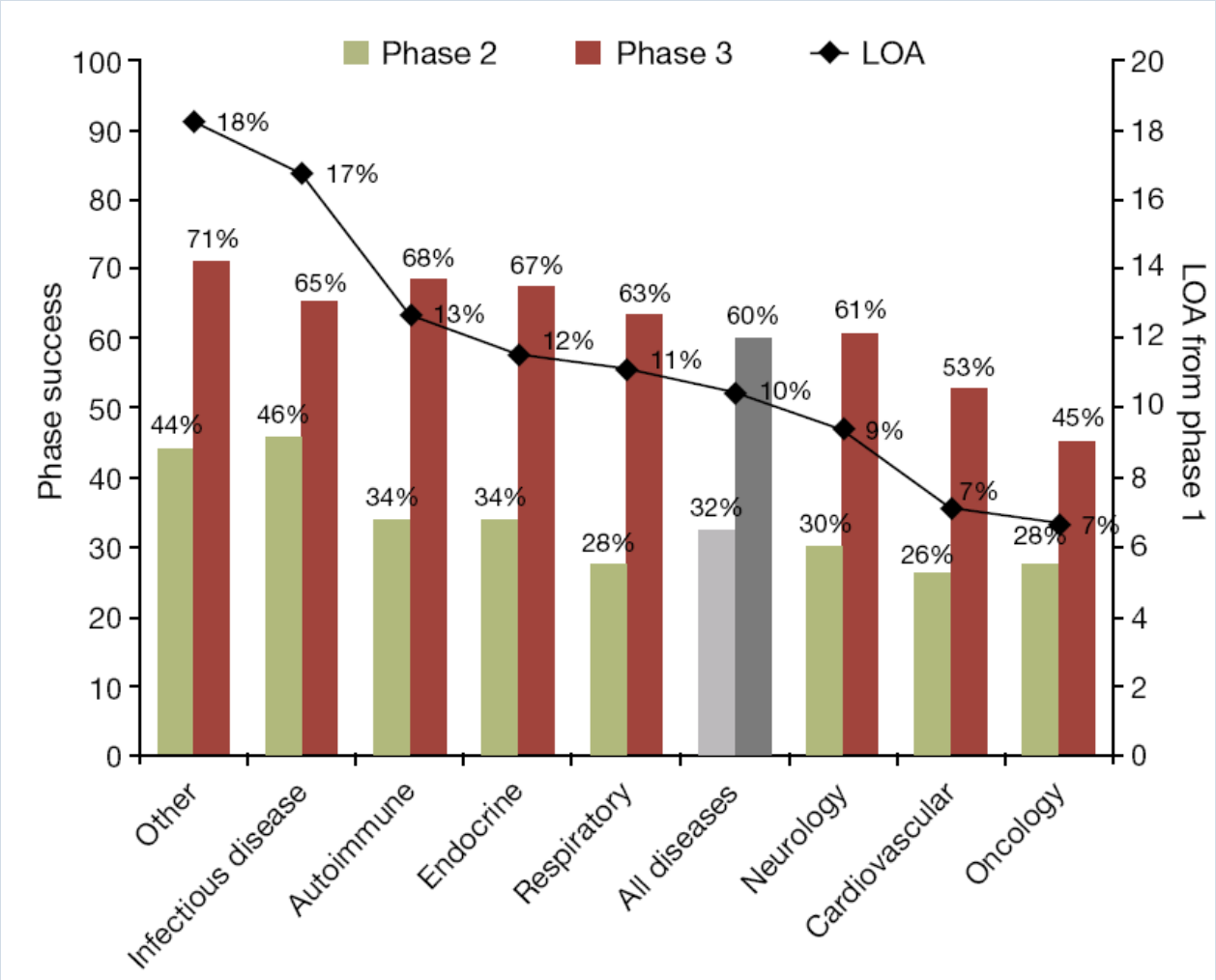
1 Devel.

2 Market

3 Discount rate

4 Risk

5 $$$$$



Source: Nature Biotechnology; Clinical development success rates for investigational drugs; January 2014
LOA: Likelihood of approval

Adjust for Risk (III)

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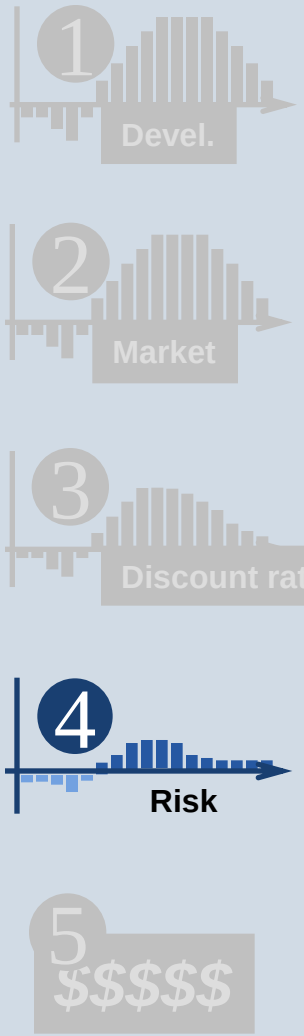
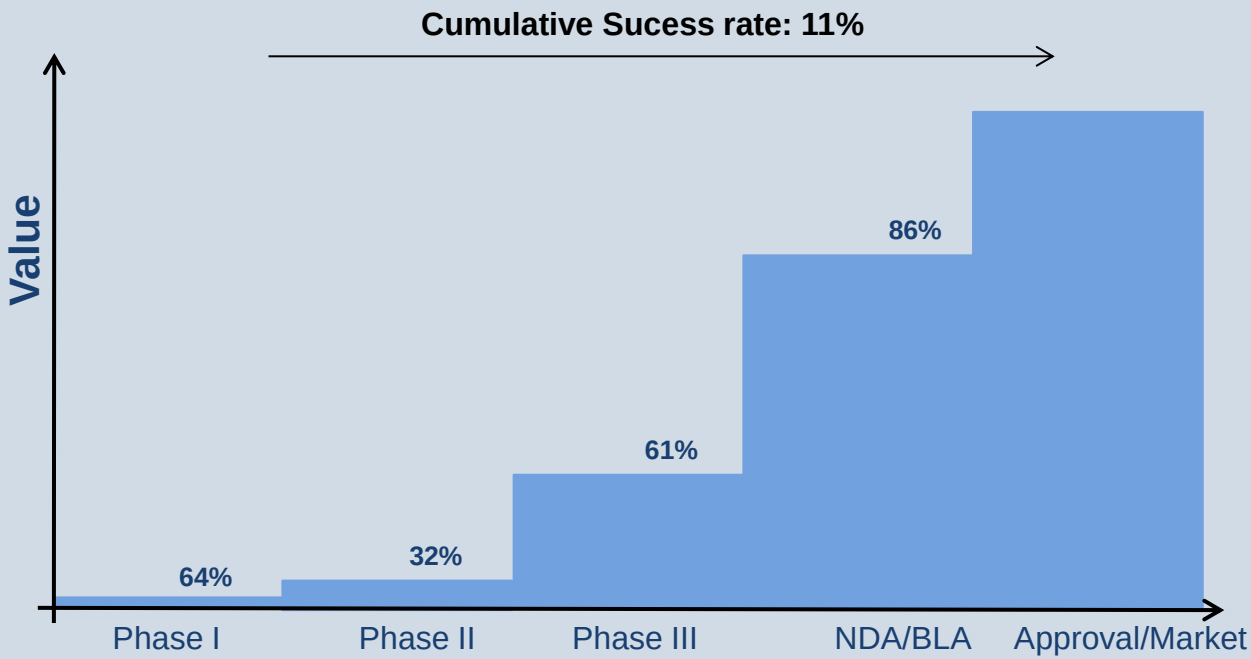


The relation between Risk and Value

- Completion of a phase ➡ Direct value increase

m USD
672
477
125
18
8



Deal-terms

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- Front/ back-loading a deal can heavily influence deal structure

- Deal terms dependent on needs of both parties

In USD m	Payment of	rNPV* (or up-front)
Up-front	1 m	1 m
Finish Pre-clinical	1 m	0.44 m
Finish Phase I	1 m	70’000
Finish Phase II	1 m	17’000
Finish Phase III	1 m	8’000
Approval / Enter market	1 m	5’000
Royalties	1%	0.70 m

*** Time value of money and Risk adjusted**

VENTURE VALUATION

1. Overview of product valuation
2. rNPV product valuation
3. **Conclusion and Q&A**

Conclusion

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- Valuation is key in development of biotechs / LS
- Value = future risk & potential
- Valuation is not an exact science
- Its all about the assumptions

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Thank you for listening!

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