VENTURE VALUATION

Valuation of Life Sciences Companies

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Agenda

VENTURE VALUATION

1. Overview of valuation
2. rNPV product valuation
3. Deal structuring

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, Medicon Valley, SwedenBio, BIOTECanada, Maryland

Biotechgate.com

BIOTECH GATE COMPANY DATABASE | VENTURE VALUATION

45‘000 company profiles in over 70 countries, 65‘000 products, 19‘000 licensing opportunities

1) Company / Asset Directory

2) Deals Database with financial information

3) Investors database

Partial information can be found free on:

www.swisslifesciences.com / www.ukbiotech.com / www.nordic-lifesciences.com/ www.germanbiotech.com / www.usalifesciences.com

Value vs. Price

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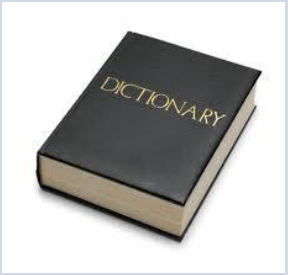

- **Value:** implies the inherent worth of a specific thing
- **Price:** depending on the market (supply / demand); whatever somebody is prepared to pay

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

By Warren Buffett

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

Biotech Valuation

VENTURE VALUATION

- Valuation is key issue in development
- Industry lacks transparency (private)
- Very difficult (high uncertainties)
- High potential for investors
- Long investment cycle
- Traditional valuation methods unsuited
- Complex technology and IP situations

Valuation of what?

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1. Valuation of a product

⇒ Licensing deal

⇒ Strategic development decision

2. Valuation of a company

⇒ Investment / Financing round

⇒ Merger / Acquisition

⇒ Measure success of company development

rNPV Valuation

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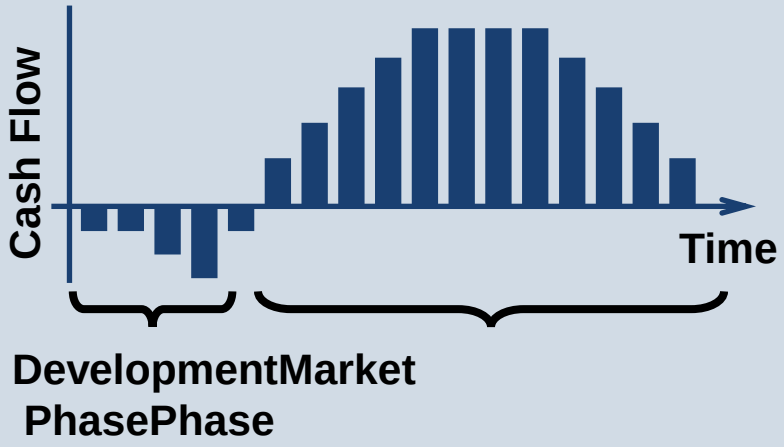
1. Development phase => investment
2. Product Risk (r) => success rate or attrition rate

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

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



VENTURE VALUATION

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3. Deal structuring

Five Step Process

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Determine Cash Flows in **Development** Phase

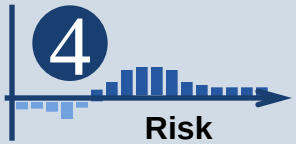
↓

Determine Cash Flows in **Market** Phase

↓

Discount with **Discount rate**

↓



Adjust for **Risk**

↓

Sum cash flows

rNPV – Example

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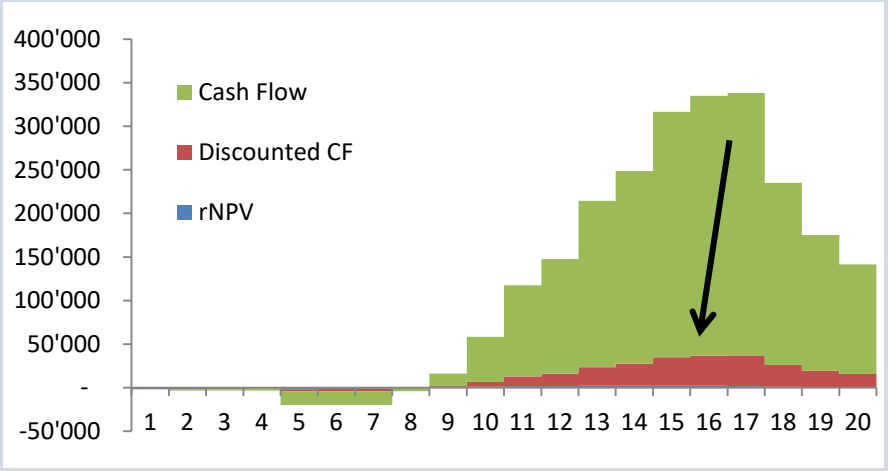
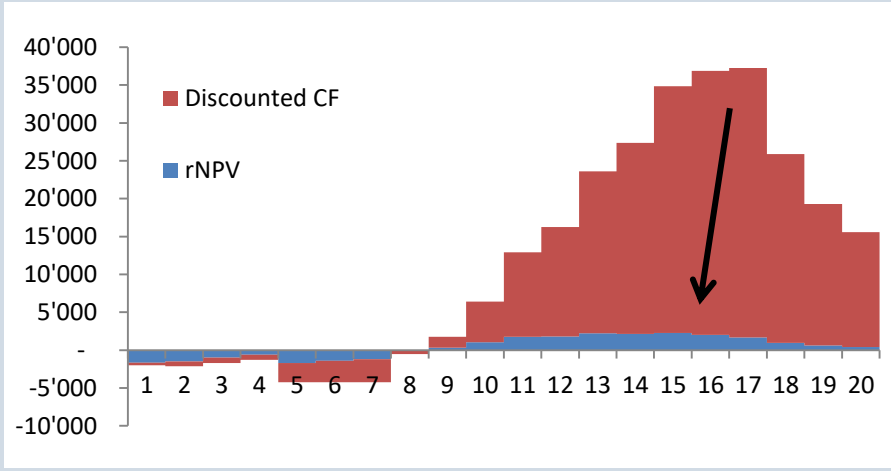
- Phase 1 product
- 20% discount rate
- 11% Probability of success (p1 to market)

⇒ 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.

Product Life Cycle

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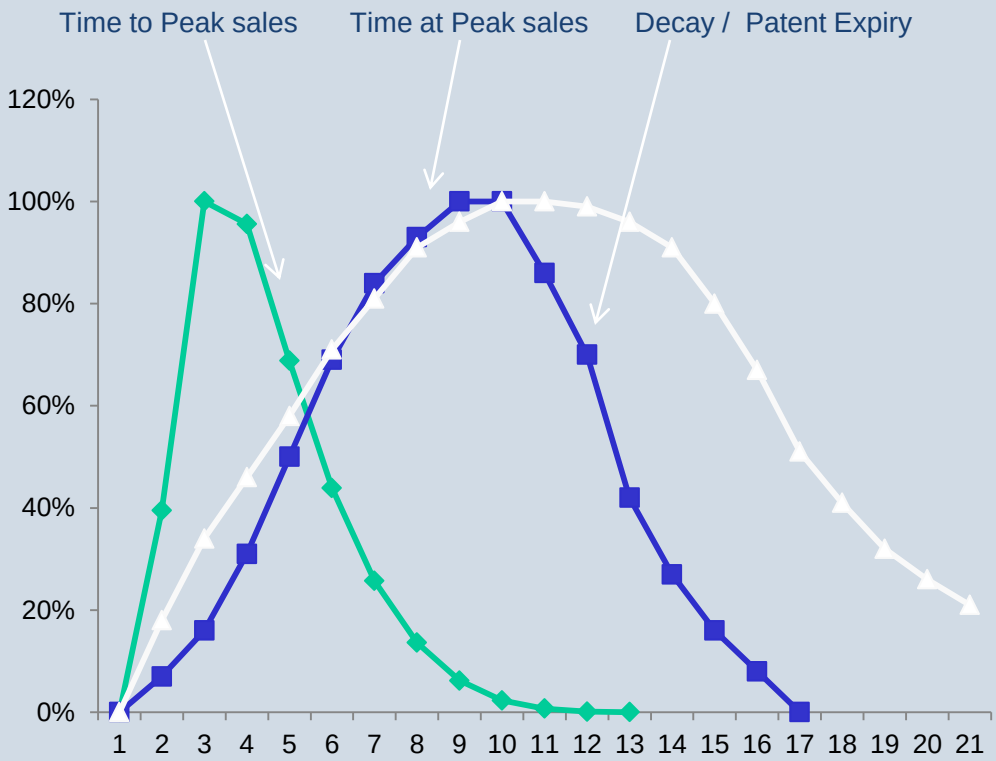

A. Define Growth Phase (4-8 years)
B. Define Mature Phase (1-4 years)
C. Define Decay Phase (7-10 years)

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

Discount rate depends on non-development associated risks

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

Risk Factors

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Product development specific risk:

- Failure / success in clinical trial

Non-product development specific risk:

- Finance risk
- Management risk
- Market / Competitive risk
- IP risk

Risk Factors IP

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Rating	Criteria patent protection	Example
6	Very good possibility	Key intellectual property in target markets is protected by **issued patents**
5	Good possibility	Patent applications have been filed, and are in **advanced prosecution stage**
4	Sufficient possibility	Few, minor patents provide only **minimal protection** (method patents)
3	Insufficient possibility	Likelihood to receive patents that will really help the company gain a **competitive advantage is small**.
2	Poor possibility	Key patents have been **rejected** or **drastically reduced in scope** of claims covered
1	No possibility	Patent protection is **not likely** in target market – i.e. prior art

How IP is reviewed

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- Scope of coverage (claims) to ensure that the IP covers the technology and product
- Patent life, expiry, potential for extension, or data exclusivity protection
- IP review includes patents, know-how / trade secrets and trade marks
- Freedom to operate / prior art search

Source:

- State of IP (www.epo.org / company)
- Competitive IP (worldwide.espacenet.com)

But we do not do a patent due diligence

Adjust for risk (I)

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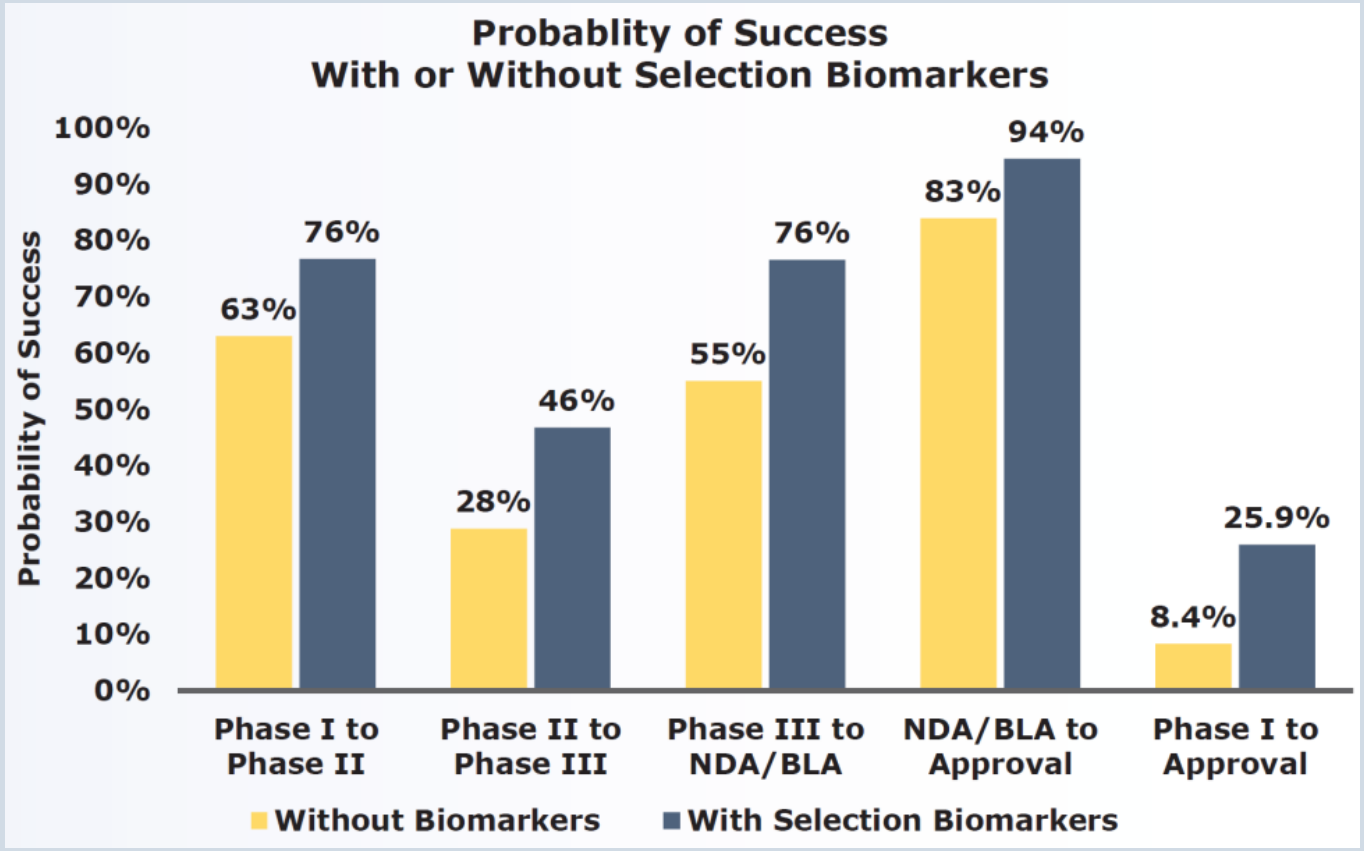
1 Devel.

2 Market

3 Discount rate

4 Risk

5 $$$$$



Source: Clinical Development Success Rates 2006-2015; BIO; June 2016

Adjust for risk (II)

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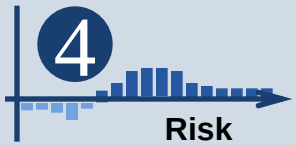

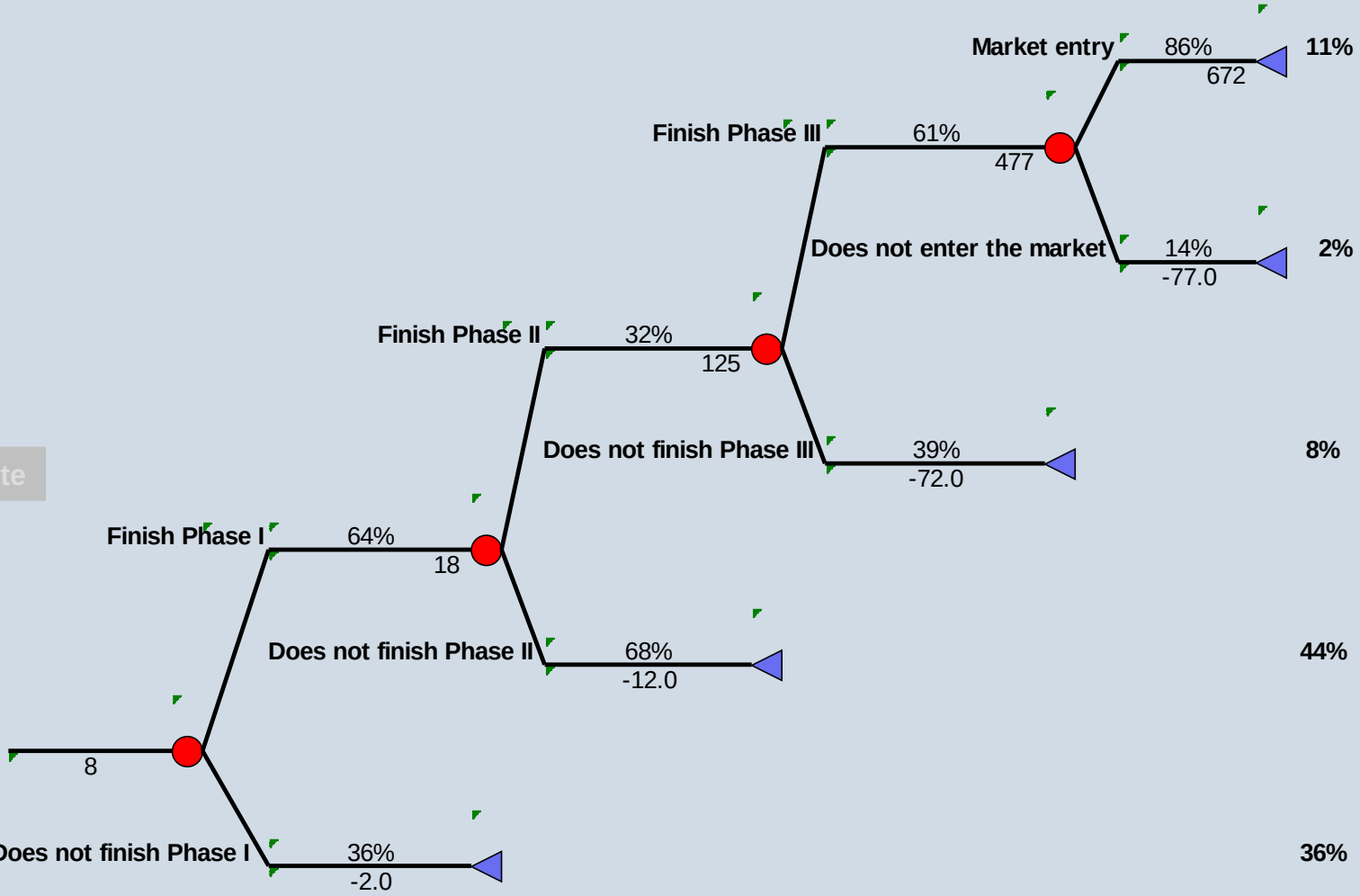

Adjust for Risk (III)

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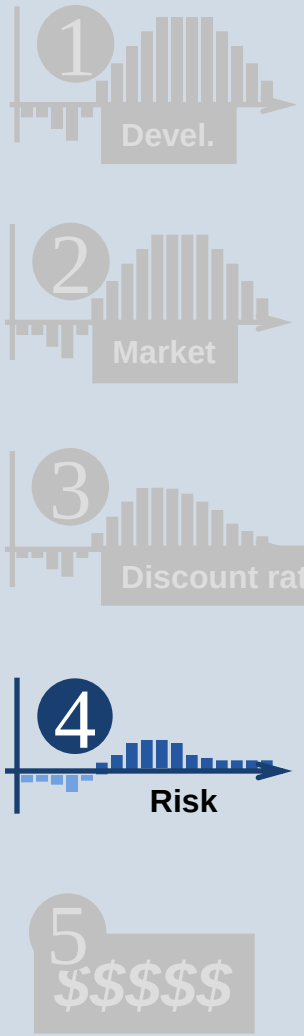
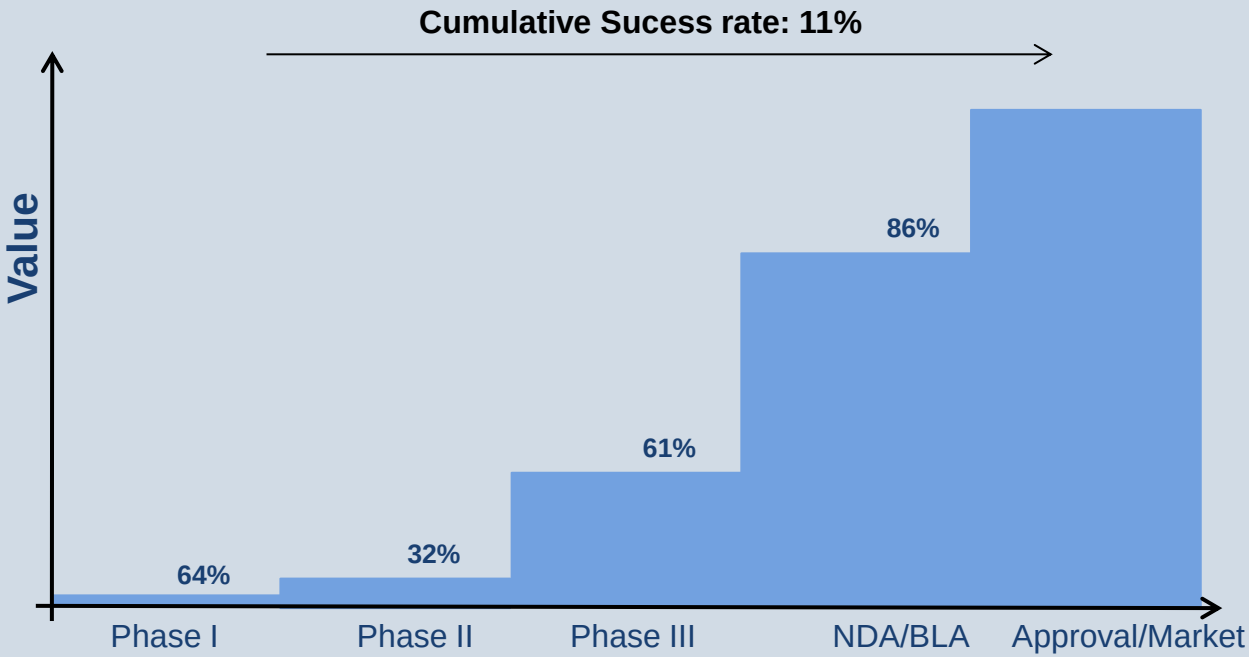
The relation between Risk and Value

- Completion of a phase ➡ Direct value increase



m USD
672
477
125
18
8



VENTURE VALUATION

1. Overview of valuation
2. rNPV product valuation
3. **Deal structuring**

Timing of payments

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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**

Timing of payments (II)

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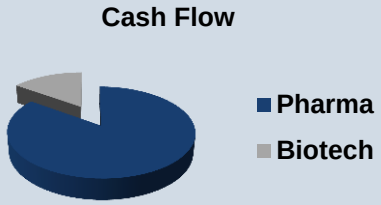
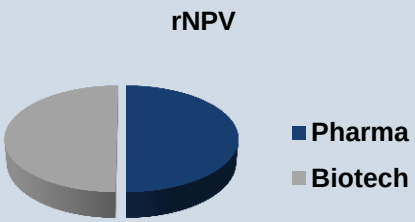
- Two very different deal structures can look identical



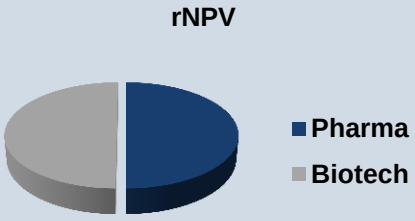
- Non-discounted, non-risk adjusted

1



- 25 million upfront
- 300 million milestones
- 5% royalties

2



- 5 million upfront
- 50 million milestones
- 12% royalties

Conclusion

VENTURE VALUATION

- Valuation is key in the development of Life Sciences companies
- Value = future risk & potential
- Valuation is not an exact science
- Its all about the assumptions

Q&A

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Thank you for listening!

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