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Valuation Methodologies and Approaches in Life Science Transactions

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Agenda

- Introduction
- Presentation
- Questions from the Audience

John Selig

Managing Partner

- 15 years of valuation and strategy experience in life sciences
- Prior to Mavericks Capital:
  - Managing Director at Woodside Capital
  - Management Consultant to large and small life sciences companies at Strategic Decisions Group and Keelin Reeds Partners
  - M&A attorney at Weil, Gotshal & Manges
- Teach valuation and finance each year at BIO's BD Executive Training course and at Stanford Medical School's Entrepreneurship Program
- Contact Info:
  - john.selig@maverickscap.com
  - www.maverickscap.com
  - 415-577-7783

Why is Valuation in Life Sciences so Complex?

Why is Valuation in LS so Complex?

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Technology

+

+ 9 months = Beta launch (90%+ POS)

Bio Pharma*

+

+ 12-15 years = Product approval (5% POS)

* Medtech (slightly) better

Risks & Time Scale Fundamentally Different

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Risk Factors	Technology	Bio Pharma
Technology	6 to 12 months	12 years plus
Execution	2 to 3 years	5 years to peak sales
Remaining Patent Protection	19 years	7 to 10 years
Placebo Effect	None	Lots
Manufacturing	None	Lots
Regulatory	None	Lots
Reimbursement	None	Lots
Landscape 10 Years From Now	Less Important	Very Important
Time to Commercialization	9 to 24 months	12 to 20+ years

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How much of this can you quantify and model?

What would that look like?

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We need a valuation methodology that is credible and validated!

(and taken as seriously as your core science & development plan!)

Why is Accurate Valuation So Important?

- To determine the value of your technology, products and business from the perspectives of
  - Financeability
  - Attractiveness to a licensee
- To determine optimal way to grow your company
  - Raising dilutive capital vs.
  - Licensing vs.
  - Selling
- To inform management decisions & frame the conversations that matter!

The Good News:

This is Easier to Learn Than the Science Underneath It

Today's Objective: Develop a Valuation Methodology

- Continually and consistently applied **Management Tool**

Key Benefits

- Improves the quality of decisions
- Enables better deal terms

Highly Desirable Features

- High utility
- Understandable
- Easy to administer and maintain

Valuation as Management Tool

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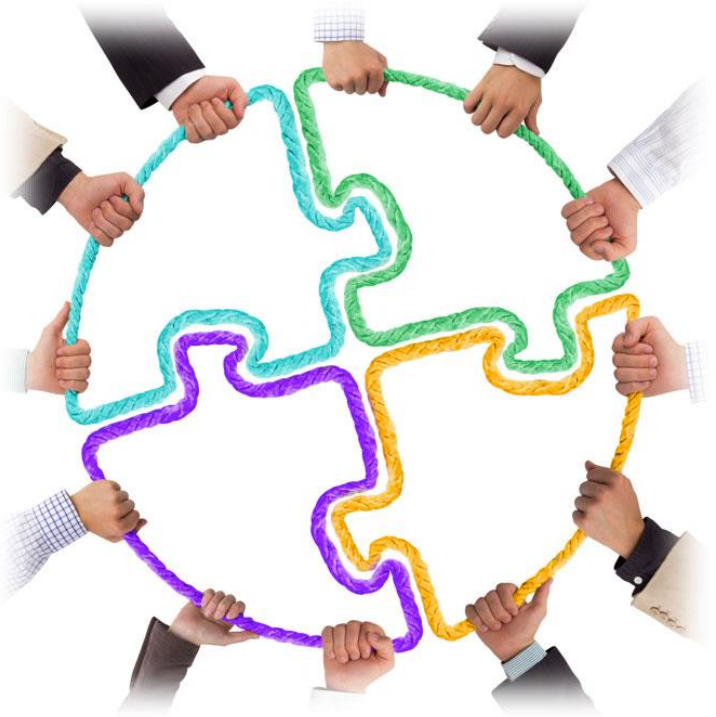
- Supporting transactions
- Facilitating internal management decisions
- Supporting external pricing (e.g., stock price)

Acceptance of Results Depends on Alignment & Agreement

- Management
- Board of Directors
- Employees
- Prospective Licensing Party
- Corporate Partners
- Investors
- Wall Street Analysts

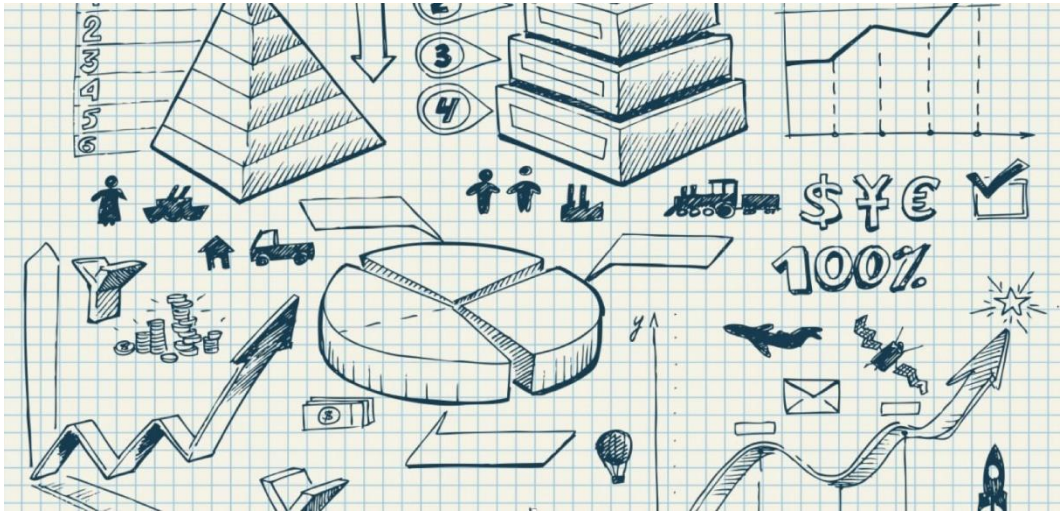
Valuation Method Should Be Easy to Administer

- **Should be consistently applied to all programs**
- **Should be regularly updated and maintained**
  - New information
  - New estimations supported by reason
  - Current financial market data
- **Bias-free**
  - Input from Finance, Bus Dev, Marketing, Research, Clinical



Valuation Methodologies

1. Sunk Cost
2. Sum of Parts
3. Comparables
4. Discounted Cash Flow (DCF)
5. Risk-Adjusted NPV (rNPV)



1 Sunk Costs

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- Using paid-in capital to date as a valuation method
- Typical approach says “We’ll give you a 5x return” but in some cases, may not even offer you 100% of paid-in

Strengths:

- Verifiable (mostly)
- In some cases, guaranteed multiple

Weaknesses:

- No one will pay for wasted money and may disagree with how money was spent
- Capped upside
- If someone offers you this, it’s because they think your asset is worth a lot more

2 Sum of Parts

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- Situation: Lead product failed and business is being liquidated
- Approach asks “What is the value of each asset*?”

Strengths:

- Best used with a business that has substantial assets to liquidate (i.e., fire sale)

Weaknesses:

- Typically receives pennies on the dollar
- Not applicable to ongoing business

** Real estate owned/leases, IP, equipment, employment contracts, distribution agreements, existing sales force)*

3 Comparables

- Derives sales and costs based on comparable products
- Example: For an oncology product (cytotoxic), compare sales for existing cytotoxics, including average peak sales

Strengths:

- Can get actual sales data
- Minimal modeling; just use averages for line inputs

Weaknesses:

- Power of the valuation is limited by how good the comp is
  - –Is the product profile similar?
  - –Is the environment when you launch in 4 years going to be the same?
    - –Payers, competitors, generics

The Problem with Comparables

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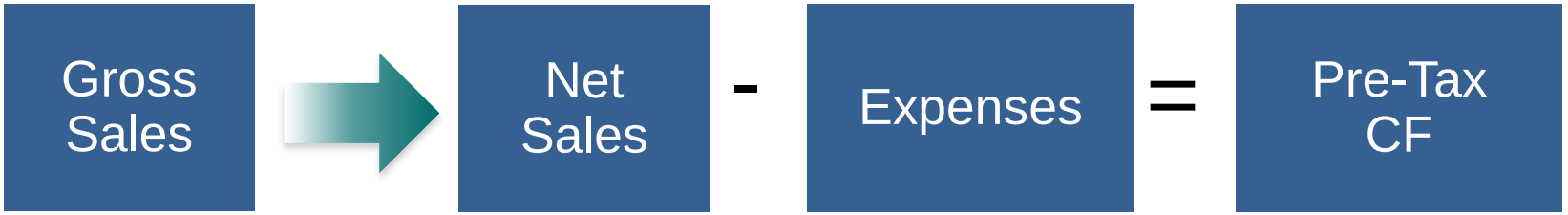
A better way to value: cash flow forecast customized to the asset or company

Driving to Cash Flow and NPV



Less rebates, returns, discounts, samples

Dev Costs
Manufacturing Costs
Marketing and Sales Costs
Outgoing License Costs

4 Discounted Cash Flow / Risk-Adjusted NPV

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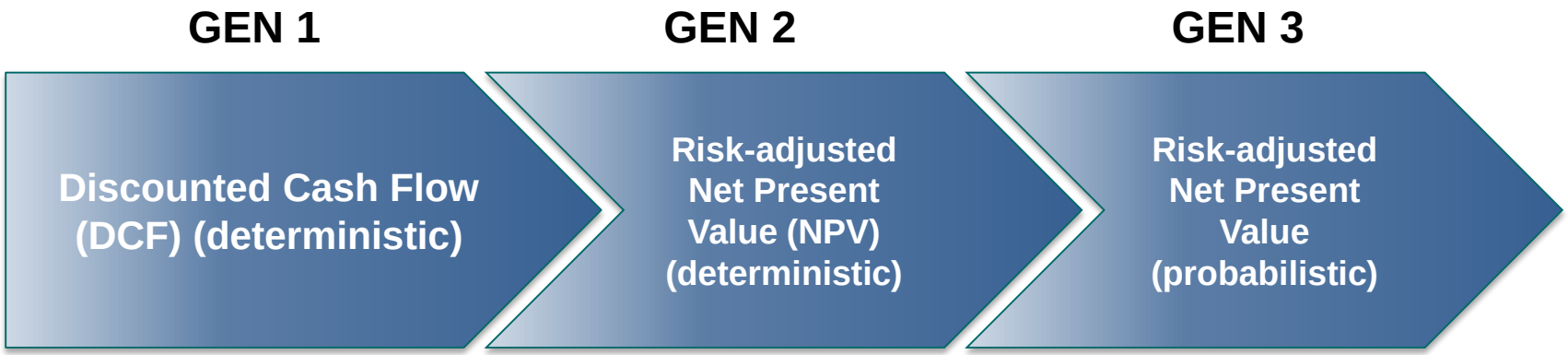
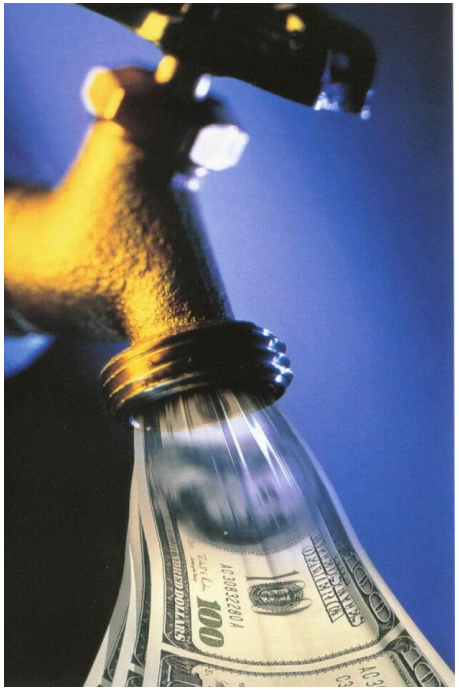
- **Approach: Use Cash Flow as the Key Metric**
  - Cash flow is change in cash balance in a specified period of time
  - Prior to launch, cash flow is a negative value unless out-license
  - Time period of cash flow must be identified
- **Key Concept: Time Value of Money**
  - Money now is worth more than money later
  - Cash received later in time is “discounted” by the interest you could have received had you that cash to invest now
- **Key Concept: Risk-Adjustment**
  - Value of an asset needs to be downward adjusted to account for forward-looking risk
- **Key Concept: NPV (Net Present Value)**
  - Stream of forward-looking cash flow, discounted (i.e., time-adjusted), and in some cases risk-adjusted, to today

Evolution of Cash Flow Valuation

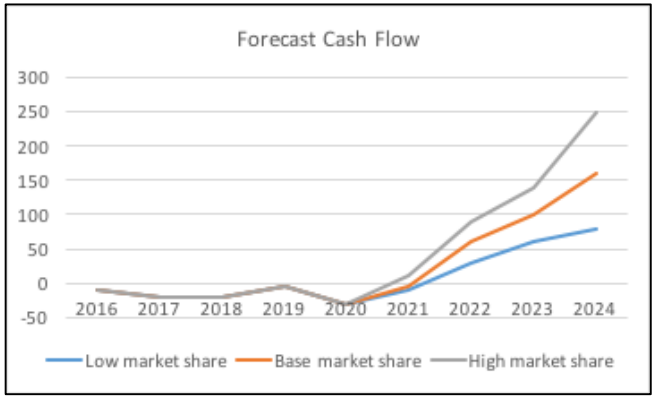


DCF Approach

- Uses a discount rate to account for both development risk and cost of capital (e.g., 20-30% rate for early stage products)
- **Deterministic**: Uses single point inputs and derives scenarios by varying only one or two inputs
- Example: Asset A is at the beginning of Phase II and is 5 years to market. DCF analysis would derive cash flow by:
  - Assigning a single high discount rate to the asset to account for risk
  - Assessing single numbers for every input and only varying, for example, price and market share



DCF Approach (continued)



Benefits:

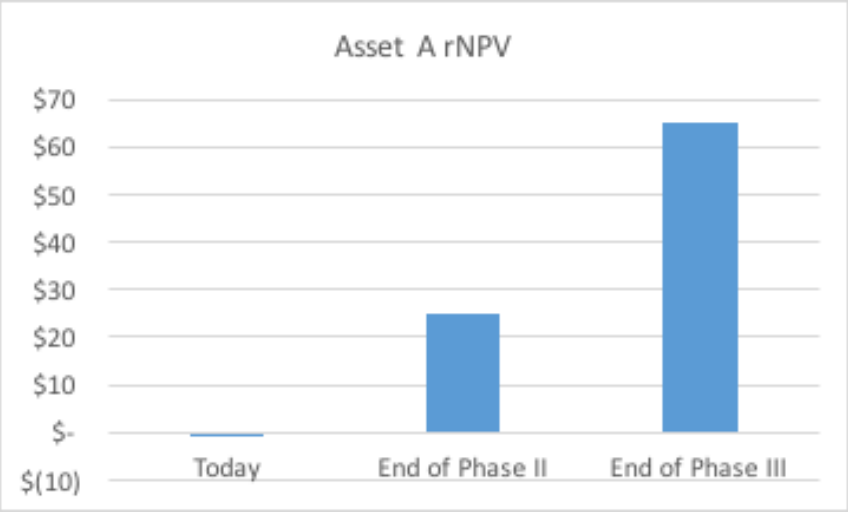
- **Easier than additional customization—one size fits all**

Issues:

- **How do you customize different levels of risk from milestone to milestone?**
- **What weight to put on low/base/high market share scenarios?**
- **What about ranges on cost of Phase III, prevalence, diagnosis rate, market adoption, pricing, competitor entry, marketing**

Risk-Adjusted Net Present Value (rNPV)

- Still using 3 market share scenarios only.
- But separating out the "one-size fits all" discount rate into two components:
  - Cost of capital
  - Stage probabilities of success



As Asset A moves forward in development and successfully completes clinical trials, it:

- Resolves risk
- Reduces forward-looking development spend
- Moves nearer to market

Why Might rNPV Be a Superior Methodology to DCF?

- **Distinguishes** risky, novel programs from less risky reformulation programs by using stage probabilities
- Allows much **more control** over customizing valuations to specific indications using probability of success benchmarks
- Allows determination of explicit risk to next milestone; **can see step-up in value** when get to the next phase

Deterministic vs. Probabilistic Models

Deterministic

- Risks are based on scenario analysis
- Costs are tied to those fixed scenarios
- Revenue scenarios typically involve a High, Low and Base Case

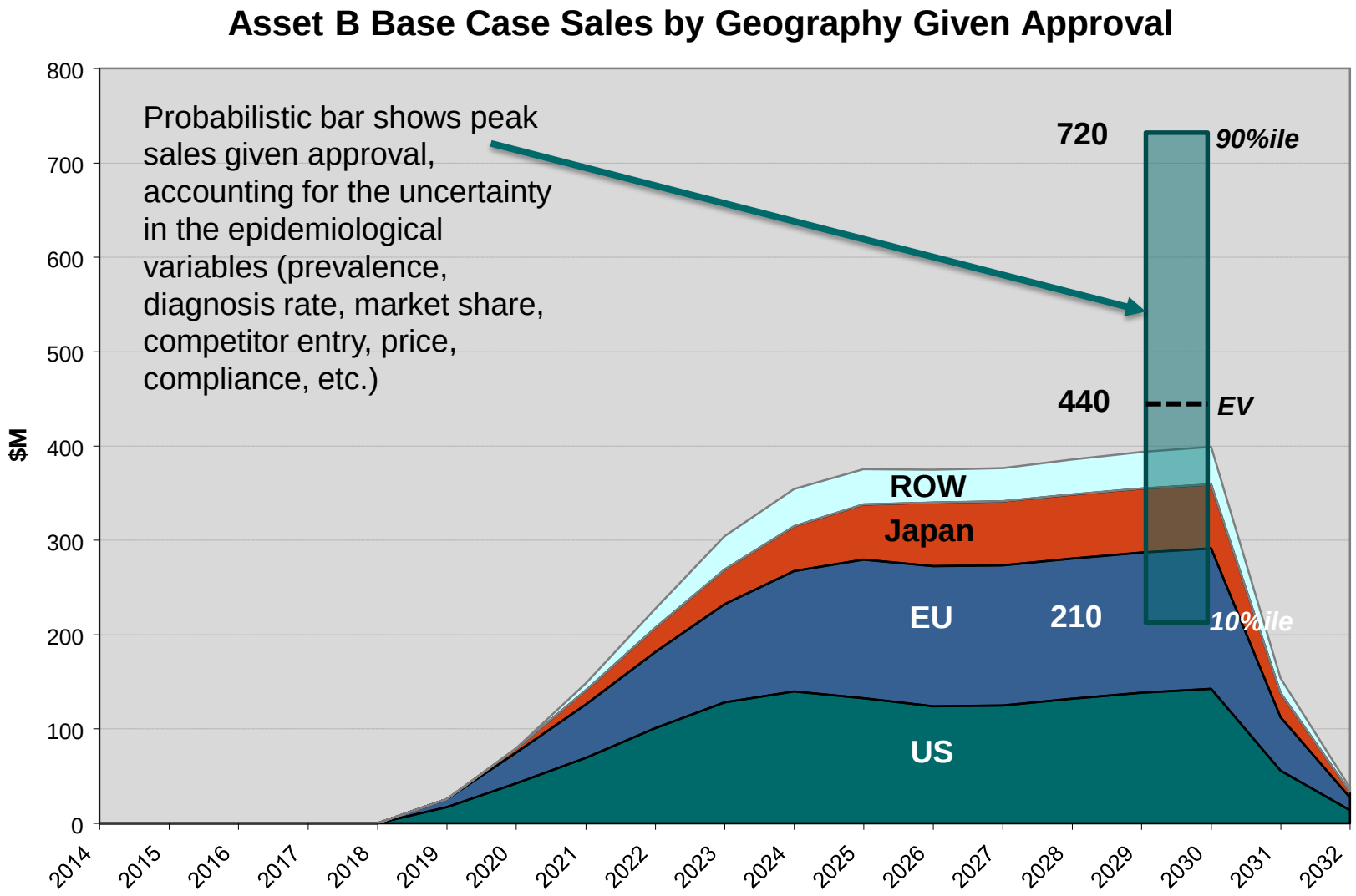
Probabilistic

- Can accommodate wide range of variables
- Each variable can have its own distribution curve (not fixed like high, low and base cases)
- Requires *Monte Carlo* simulation
- Results in probability curves for each variable and shows how each variable can affect one another

Deterministic vs. Probabilistic Models (continued)

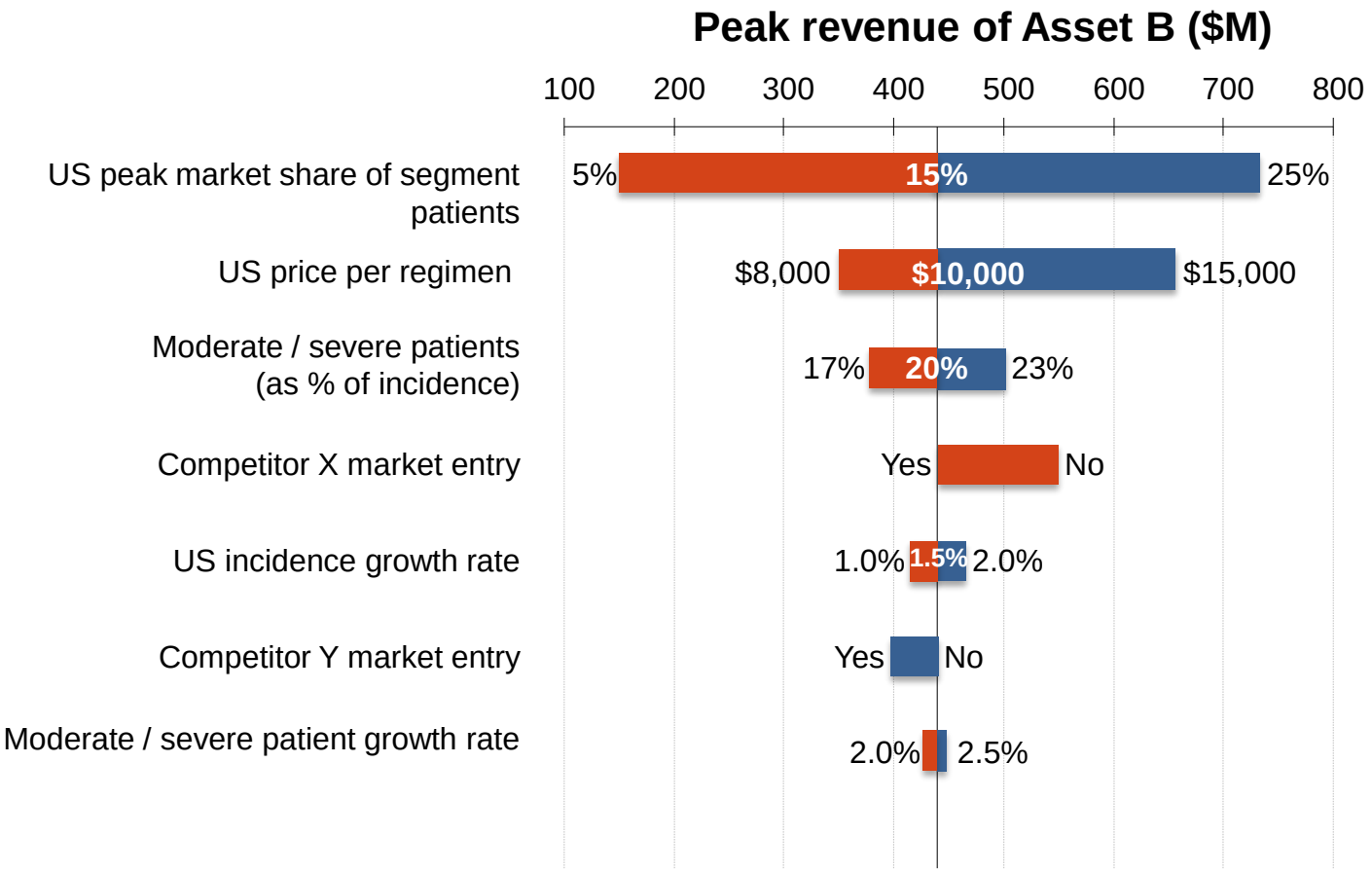
- Key benefit of probabilistic modeling is INFORMATION
- What's the probability of revenue being less than $100M by year 5?
- What's the impact on peak sales if fewer patients are diagnosed than expected?
- What's the likelihood of breaking even in 3 years?
- How likely are we to spend more than $50M on development costs?

Deterministic vs. Probabilistic Models (continued)



Deterministic vs. Probabilistic Models (continued)

Sensitivity analysis allows determination of which assessments have greatest uncertainty impact on revenue or value



Results of Valuation Survey

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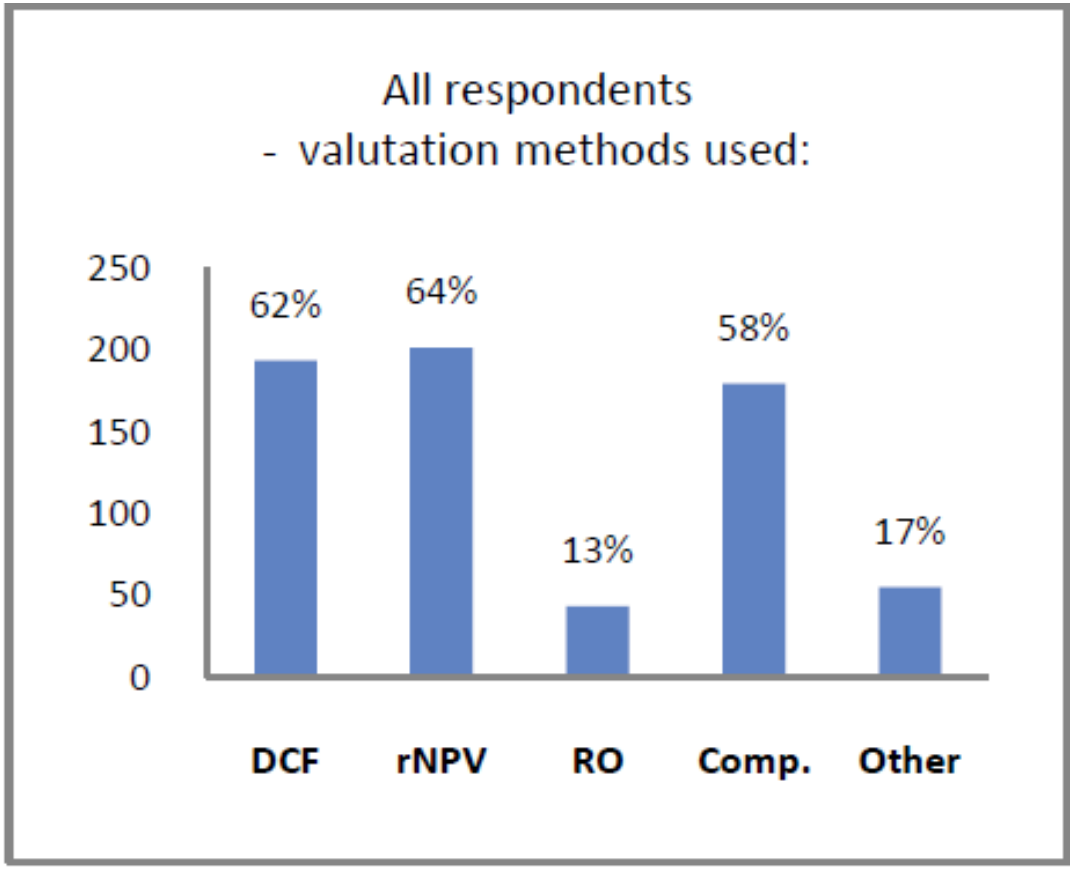
Multiple approaches:

- Sunk cost
- Sum of parts
- Comparables
- Discounted Cash Flow (DCF)
- Risk-adjusted NPV (rNPV)

Which of these valuation methodologies are used most often in life sciences analytics?

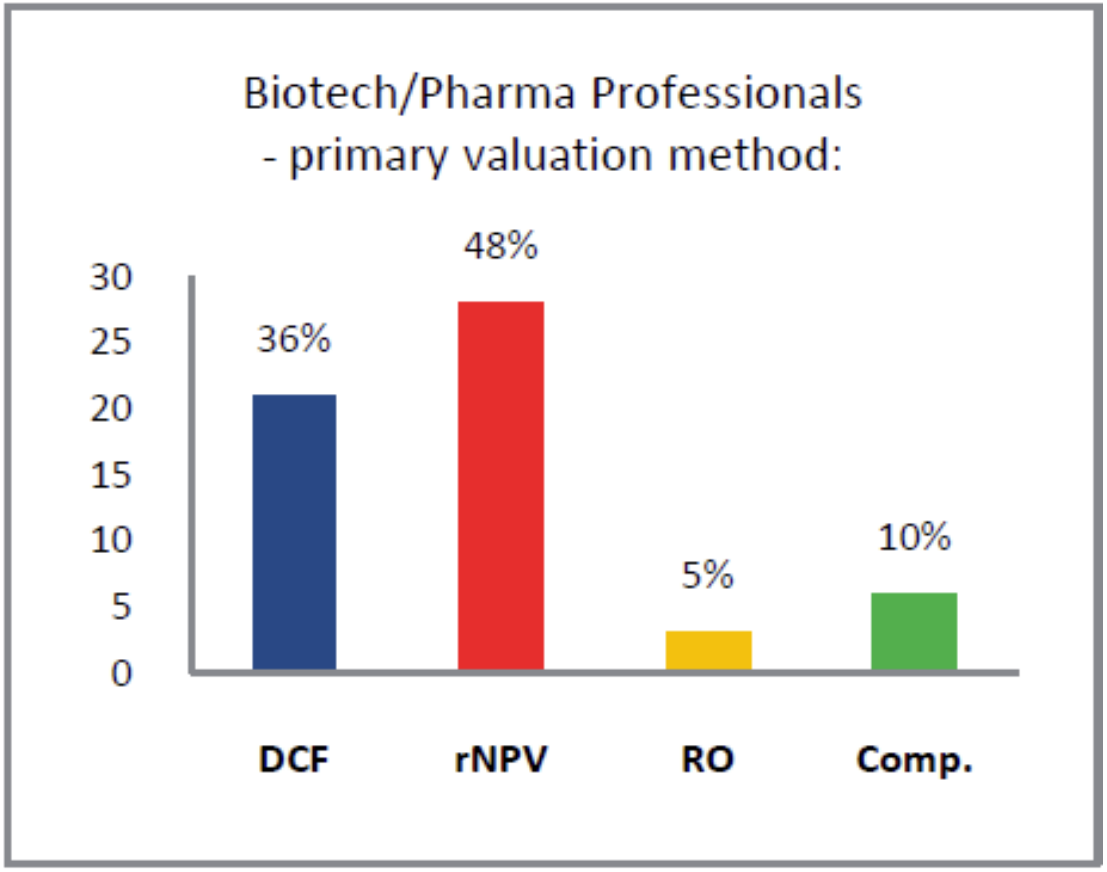
Used Most Often Across Areas



Source: BIOSTRAT Biotech Consulting

Which Methods Do Pharmas Use Most?

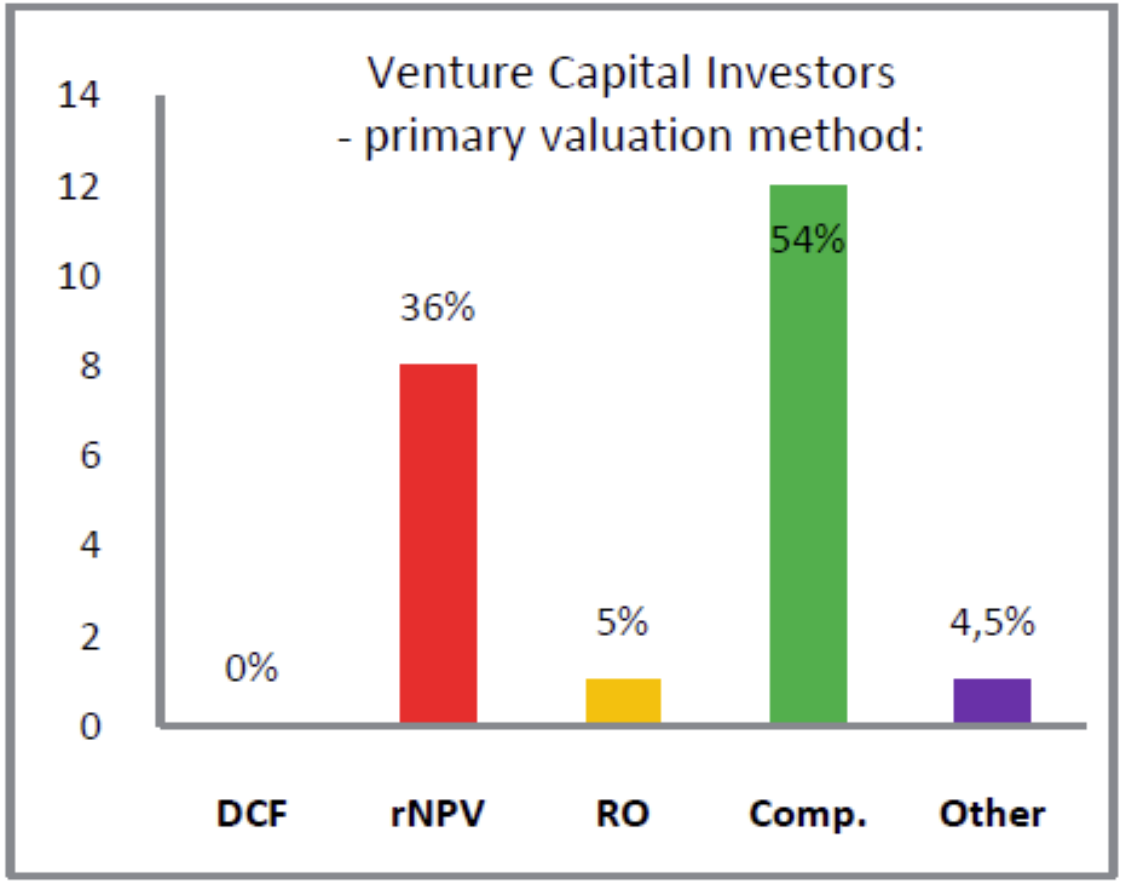
Used Most Often by Biotechs / Pharmas



Source: BIOSTRAT Biotech Consulting

Which Methods Do VCs Use Most?

Used Most Often by VCs



Source: BIOSTRAT Biotech Consulting

Know With Whom You're Speaking

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- **VCs**
  - Fewer resources and time compared to pharma
  - Potentially different calculating framework (i.e., what do I think my likely exit is based on 4 other companies in this space, so therefore what pre-money valuation will I give in order to achieve a 10x return?)

  - **But a good analysis may give them confidence in the management team and allow them to consider a higher than otherwise valuation**
- **Pharma**
  - Have the resources to do full epi builds and downstream operations matter to them
  - **A good analysis allows you to justify better deal terms**

Valuation Methodology: A Powerful Tool

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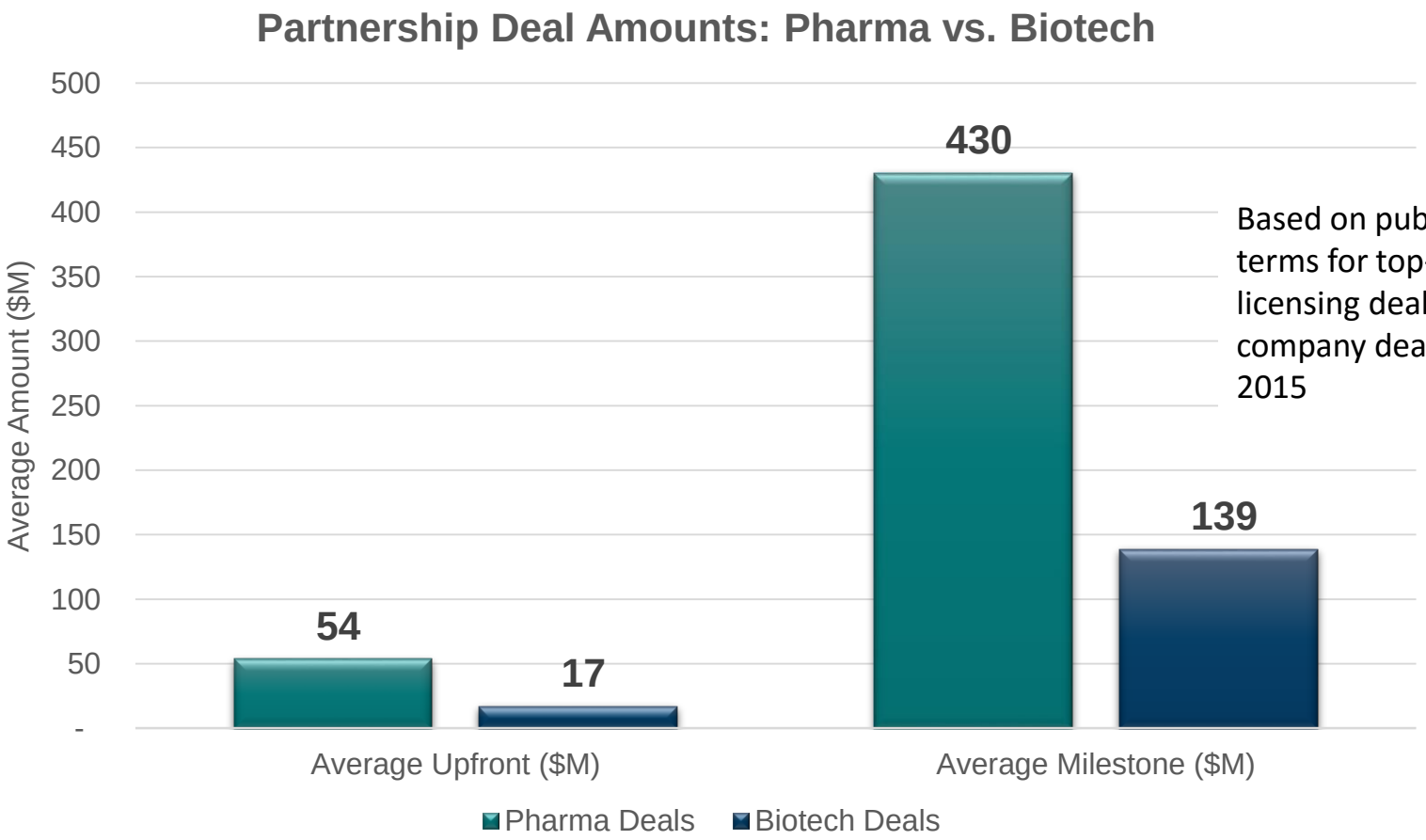
- Evaluating and negotiating licensing deals
- Assessing value of programs
  - Selecting and prioritizing
  - Budgeting and monitoring
- Financing and investor relations
- M&A

DEAL APPROACHES BY PHARMA VS BIOTECH

Big pharma does indeed appear to pay more

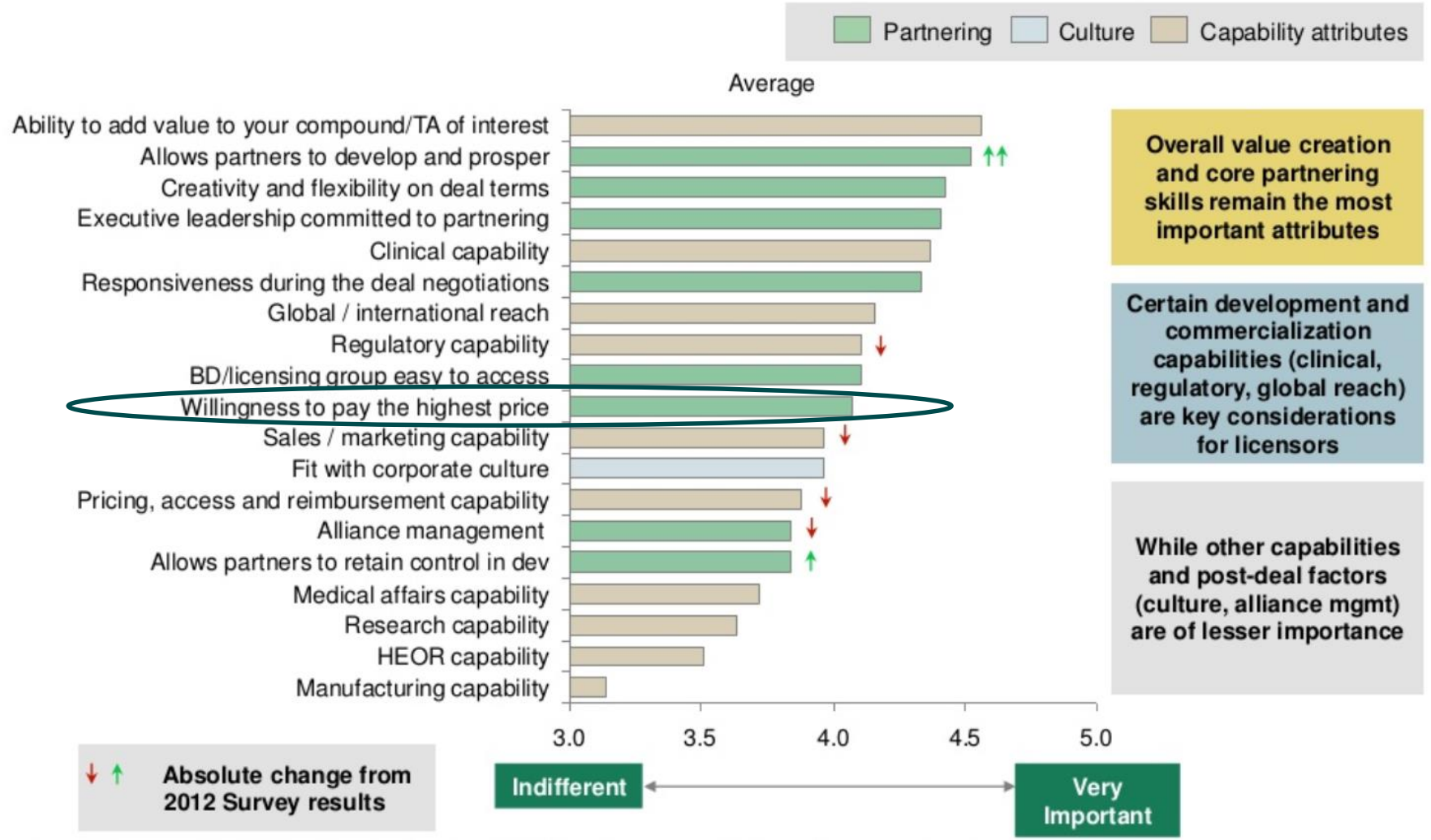


Based on publicly available terms for top-25 pharma licensing deals and smaller company deals in 2014-2015

BUT: it's also reasonably likely that they get access to the best science, so the licensed assets may also be more valuable

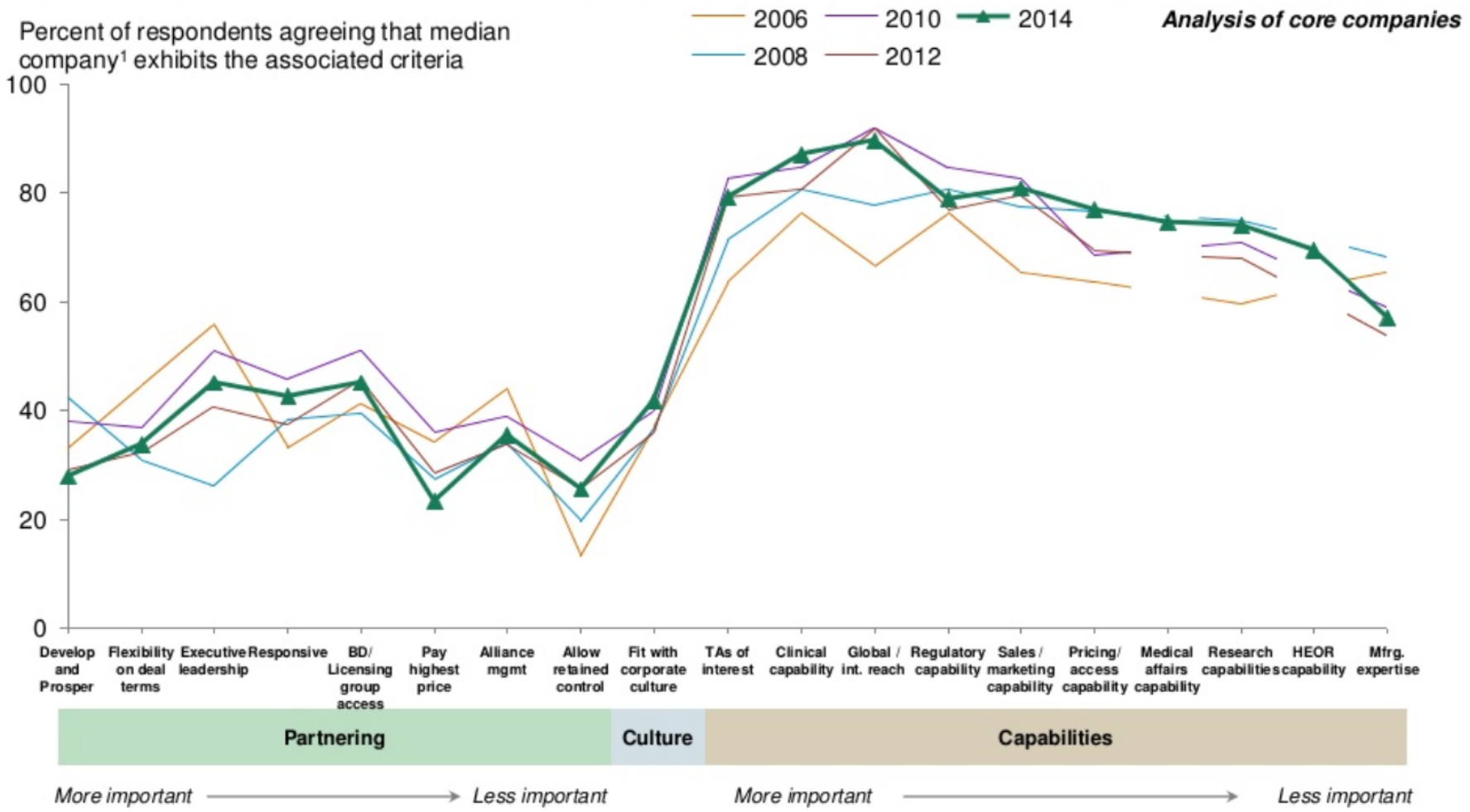
Source: Global Data; Mavericks Capital analysis

BUT: biotechs primarily focused on partnering skills and a few selected capabilities



Source: The Boston Consulting Group

Perceived performance remains high on capabilities, lagging on partnering skills



Source: The Boston Consulting Group

Partnering Approaches - Conclusions

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- Big pharma does seem to pay more
- The ability to create the most value remains the most important factor in choosing a licensing partner.
- However, demonstrating core partnering skills during the negotiation phase
  - For instance, showing creativity and flexibility on the deal terms, being responsive, and having executives who demonstrate their commitment to partnering.
- Core clinical skills are equally essential as firms seek partners that can successfully bring their compounds over the finish line.
- Commercial, regulatory and pricing, and access capabilities are no longer considered differentiators; they are prerequisites. Increasingly, responsiveness and communication are coveted qualities in a partner.
- Global reach has become more important, as licensors recognize the vast market potential—as well as the looming competition—in emerging markets.
- Heft matters less. Since 2008, a significant percentage of deals have been between smaller companies.

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THANK YOU!