

# Collaborate to Innovate Better?

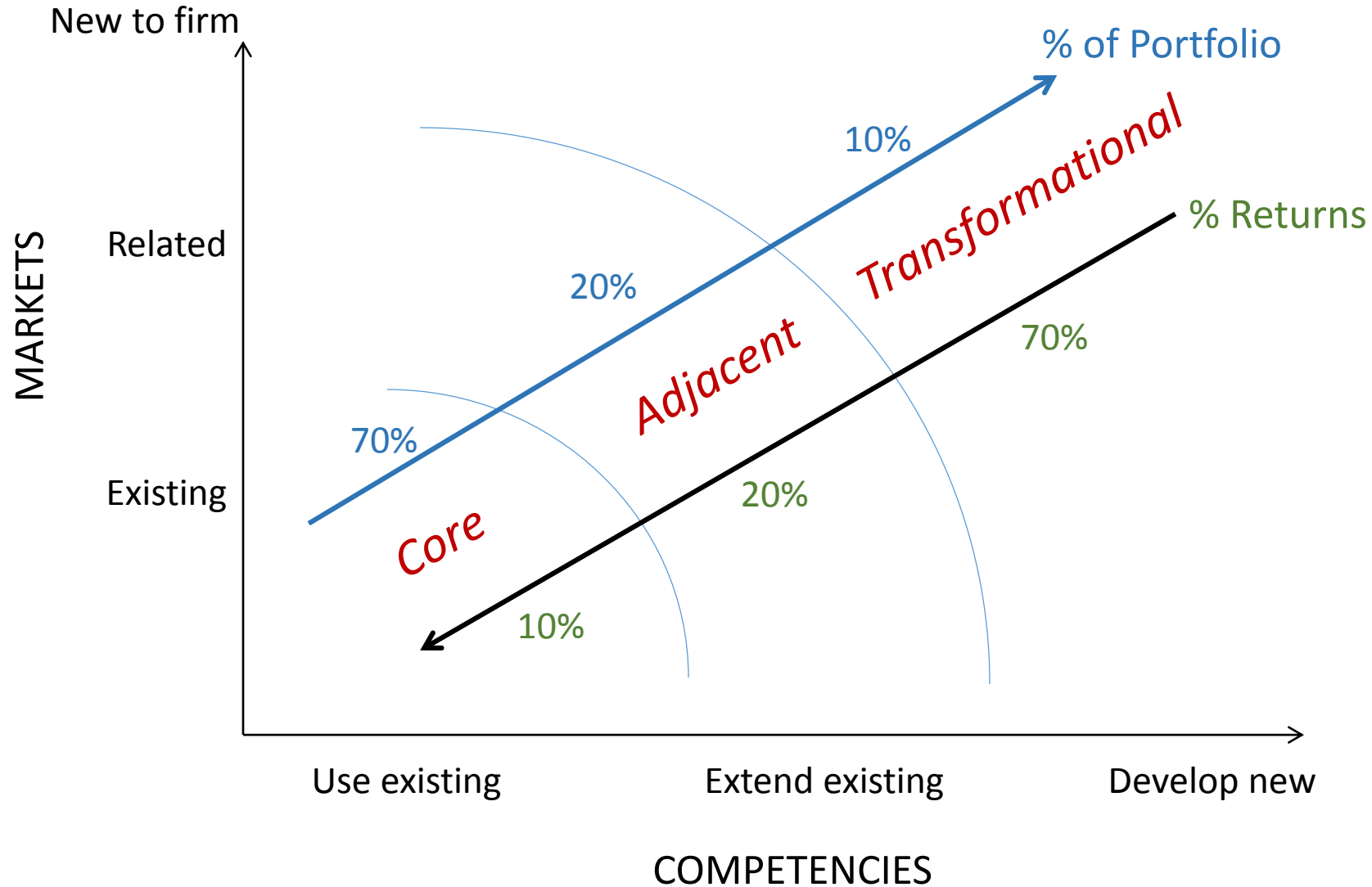
## When Partner **DiveRsity** Leads to Breakthroughs

Wednesday, May1      9:30am-10:30am  
2019 IRI Conference  
Pittsburgh, PA

Susan K. Cohen, Katz Graduate School of Business, University of Pittsburgh  
Turanay Caner, North Carolina State

# Transformational Innovation Drives Profitable Growth.

*Why do established firms do so little of it?*



These % allocations are for higher performing firms.

Most firms fall well below these allocations outside the core.

# Typical Barriers to Innovation

**Opportunity Cost /  
Required Revenues & ROI**



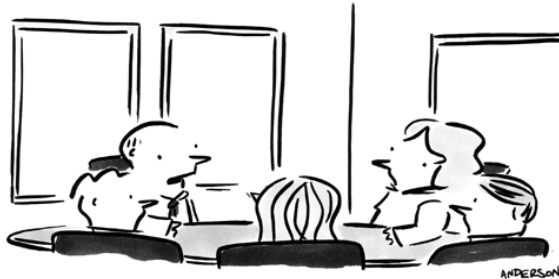
**Risk Aversion**



**Inertia / Power Dynamics**

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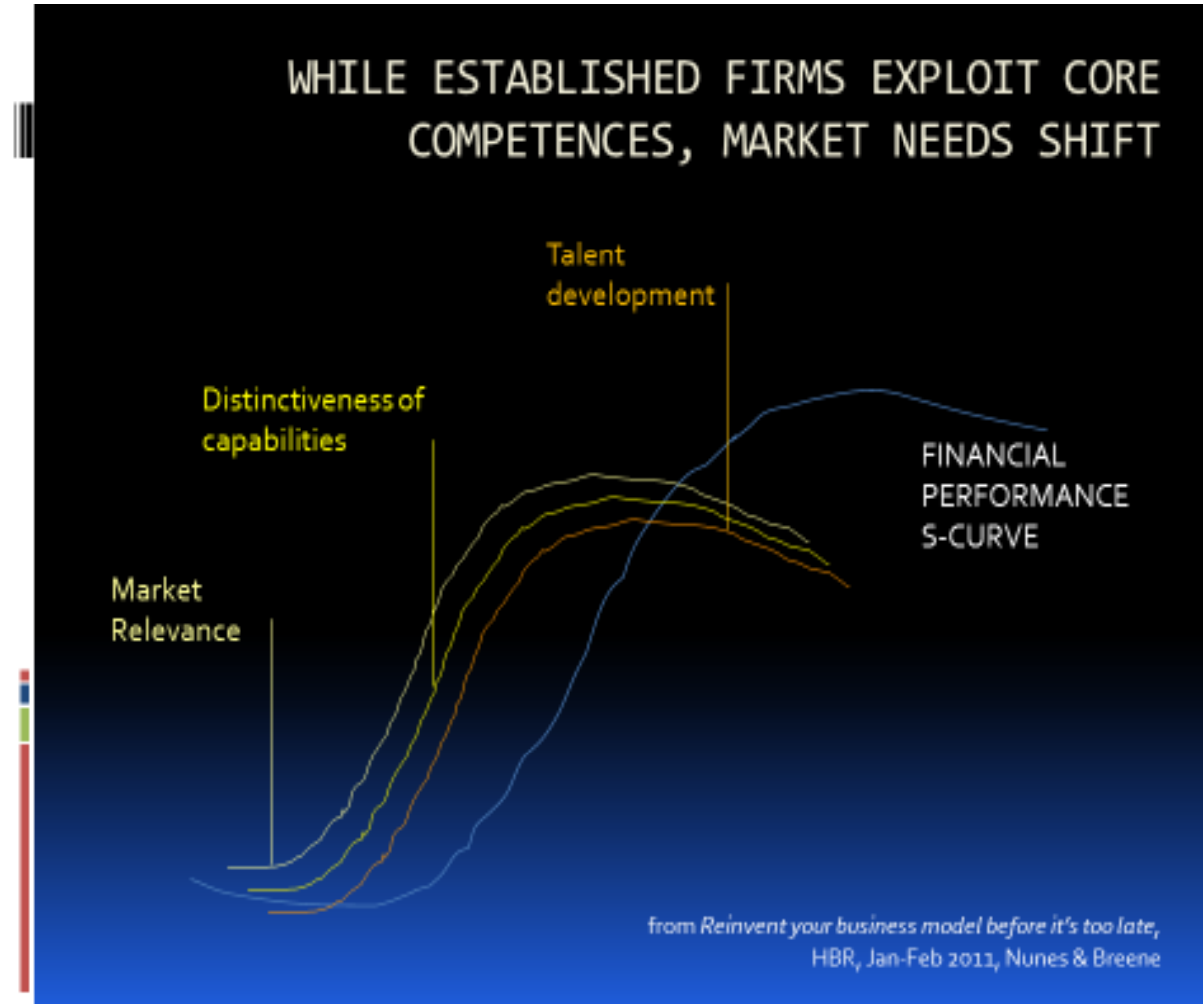
"OK, now that we all agree, let's all go back to our desks and discuss why this won't work."

**Hubris / Limited Attention**

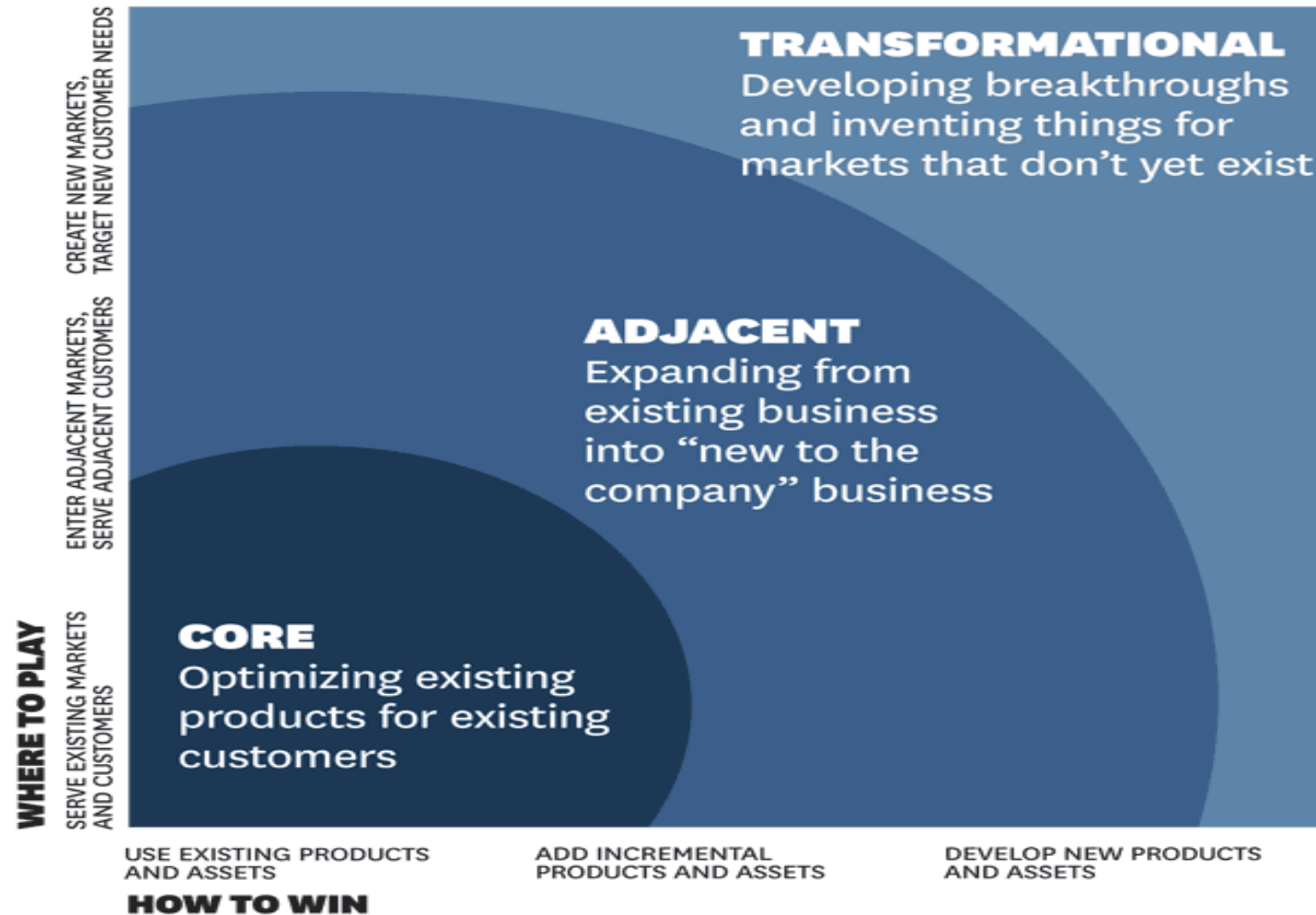


# Does it Matter if You Never Develop a Breakthrough?

## Commodity Death Spiral



# Can Partnerships help Established firms shift more Resources from Core innovation toward Transformational innovation?



# Advantages and Risks of Partnering

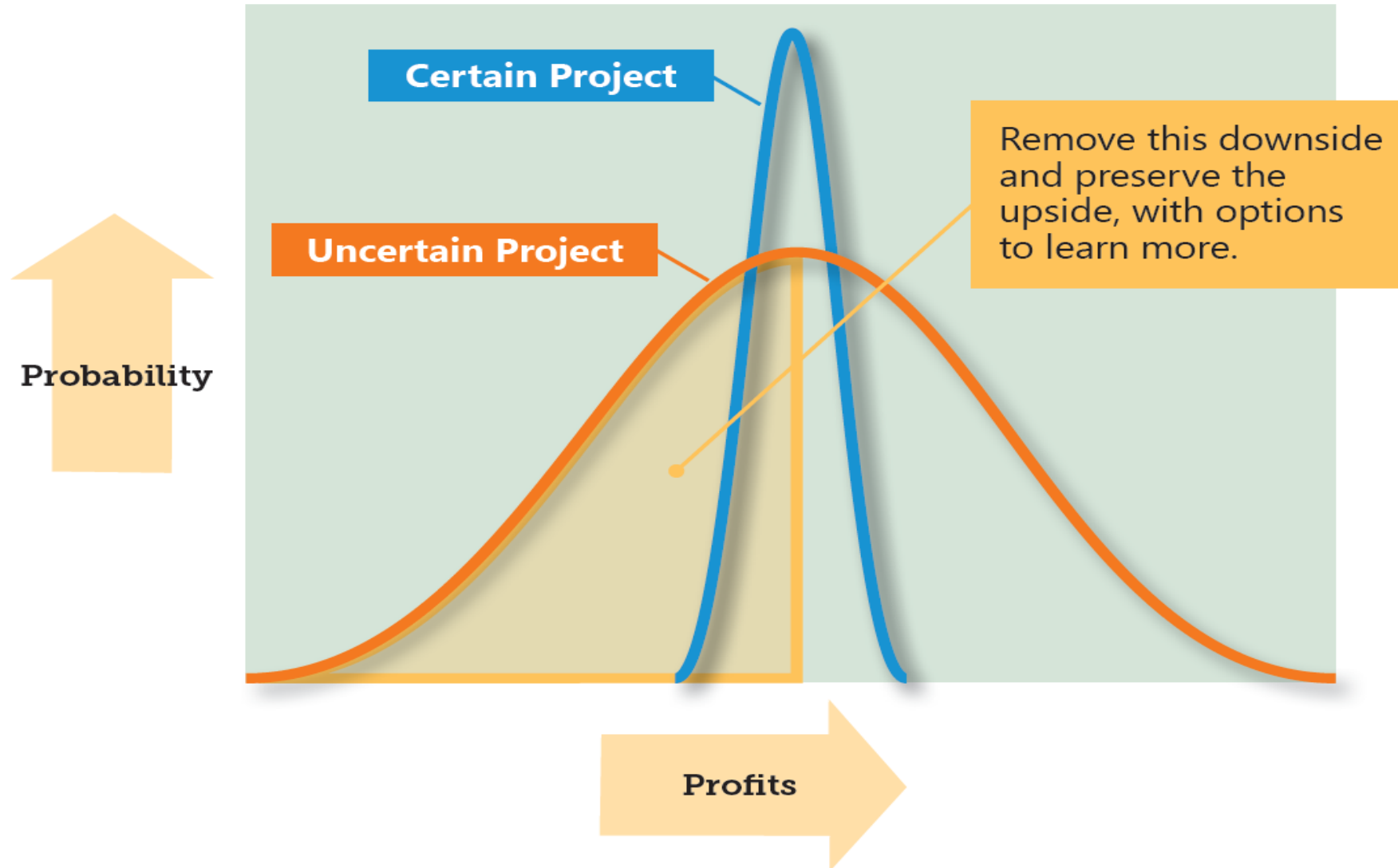
## Advantages

- Pool early-stage research risks
- Complementary expertise
- Mitigates internal groupthink / blinders

## Risks

- Knowledge leakage
- Organizational distractions
- Transaction costs

# Removing the Downside in Uncertain Projects



What we want to do is to trim the downside tail and extend the upside tail / raise the mean value from innovation!

# Partnership Advantages can be Realized at Different Points in the Innovation Value Chain

- Research suggests novel insights occur at the interfaces of distinct domains

Need a broader threat lens

- Collaborate with diverse partners to de-risk if exploratory invention → **Selection** effect [trim the left tail]

Need a broader opportunity lens

Collaborate with diverse partners to recombine if exploitative invention → **Variation** effect [extend the right tail]





# Pharmaceutical Context

Informative context for understanding when and how alliances augment innovation, because:

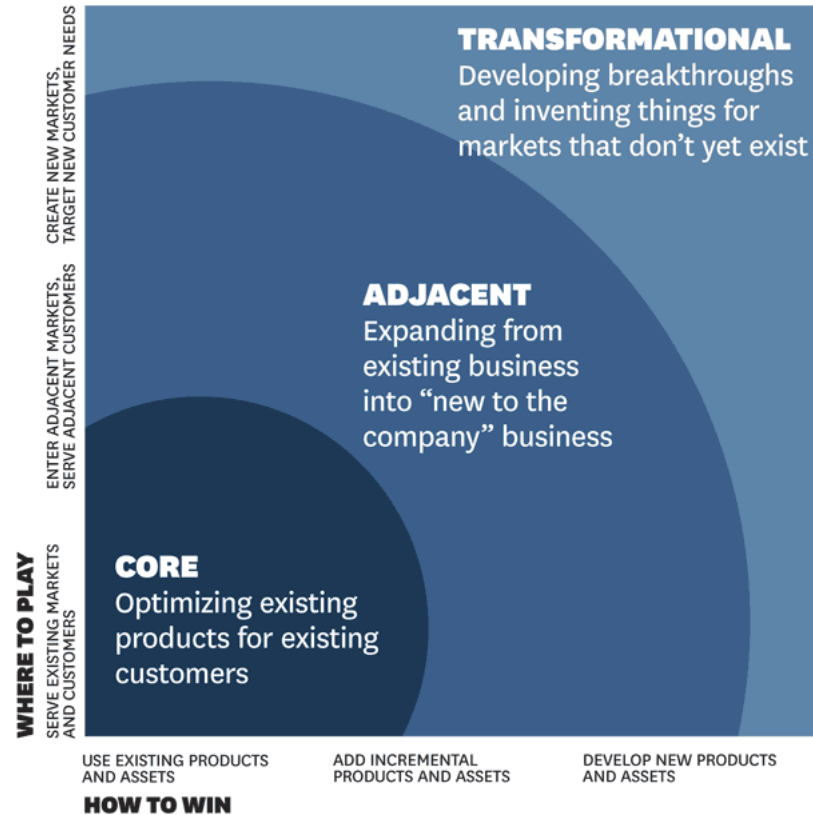
- The distinction between invention (drug discovery) and innovation (drug development) is easy to discern
- The 'breakthrough' status of inventions (patents) and innovations (new drugs) is established through a standardized set of processes
- Pharmaceutical companies were early adopters of alliances
- **Caveat:** strong IP here means care is required when extrapolating findings

## What We Measure

- **Exploitative invention** -- for a focal year  $t$ 's patents, total number of times a firm cites patents it has previously cited (as a proportion of total citations)
- **Breakthrough innovation** -- annual count of new molecular entities approved for sale (active ingredient never marketed in US before)
- **Collaboration** -- R&D alliances
  - 60% originate in drug discovery (research leading to patent)
  - 40% begin during drug development (pre-clinical to NDA)
- 243 biopharmaceutical manufacturers, 432 alliances

# Finding 1:

## Exploitative (~Adjacent) Inventions Increase a Firm's Chances for Breakthrough Products



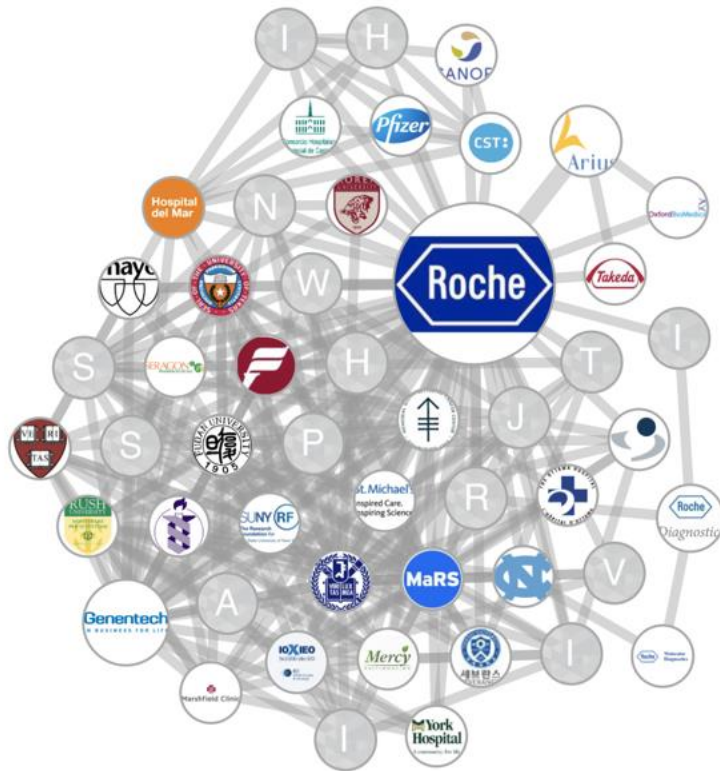
**Transformational:** too far from firm's existing knowledge base and expertise

**Adjacent:** new applications / extensions of existing knowledge. Capable of being understood and implemented by the firm.

**Core:** important for operational excellence / competitiveness, but poor track record for generating breakthroughs (law of diminishing returns)

## Finding 2: Alliances Enhance a Firm's Chances for Breakthrough Products

Roche & HER2 gene (breast cancer)

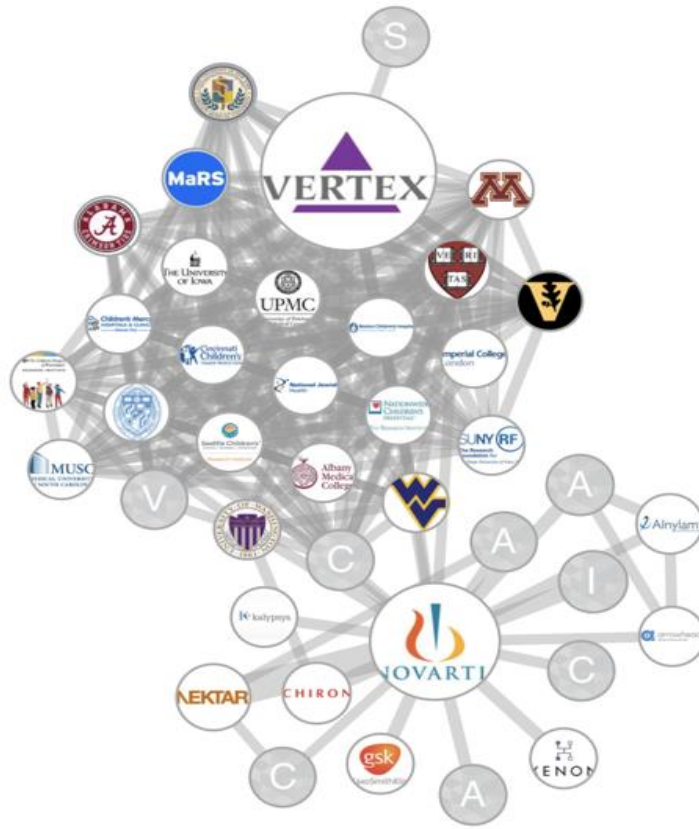


Pfizer & Anti-Inflammatory



# Finding 3:

## Moderate Levels of Knowledge Diversity in a Firm's Alliance Network Maximize Its Chances for Breakthrough Products



Novartis brings novel partners, with novel expertise, to Vertex's network of partners for cystic fibrosis therapies.

# Takeaways

1. Your firm's Knowledge Network **is a choice** – either conscious or implicit
2. Choose partners based on a) your strategic objectives, and b) their complementary knowledge assets
3. Seek a diversity of partnerships – both to a) maximize future option value, and b) encourage new patterns thinking internally
4. "Friends of friends" are important assets in optimizing your choice of alliances and partners

Thank You!!

Questions?