Corporate Support for Non-Private Research:
Global and Local Sourcing of Competences and Expertise

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Synthetic Proto-Thinking on
Argument

• Convergence through synthesizing multiple streams of research literature
  – Strategy & theory of the firm
  – Innovation management & technology strategy
  – Social movements & organization science

• Discussion of propositions raised by synthesis of concepts

• Early (& incomplete) empirical findings
Synthesis in Strategy

Literatures - I

• Knowledge-based view of the firm (Nonaka & Takeuchi)

• Organizational learning (Huber)

• Dynamic capabilities (Teece et al)
  – Including organizational ambidexterity, etc.
Synthesis in Strategy Literatures - II

- Dynamic capabilities
- Alliance theory (Gomes-Casseres, Hagedoorn)
- "Learning" alliances (Doz)
Synthesis in Innovation

Literatures - I

• Evolutionary view of innovation (Rosenberg, Nelson)

• Real options theory (Bowman & Hurry)

• Strategic technology platforms (Meyer, Cusumano)
Synthesis in Innovation Literatures - II

- Strategic technology platforms

- Complexity in industrial technology (Rycroft & Kash)

- Science as “search” (Fleming & Sorenson)
Synthesis in Social Organization Literature - I

- Social movements (McAdam et al)
- Social capital (Putnam, Fountain)
- Institutional innovation (Van den Ven et al)
Synthesis in Social Organization Literature - II

• Institutional innovation

• Role of trust in innovation (Bidault & Castello)

• Innovation networks & communities (Hage)
Synthetized Theory

- Learning alliances
- Science as search
- Innovation networks & communities
- Theory of collective networks of institutions for scientific & technological innovation
Propositions for Proto-Thinking

• Research collaborations among diverse institutions are more likely to produce significant innovation
  – Diversity increases opportunities for learning
  – Learning will lead to discovery of new strategic technology options
  – BUT diversity can also hinder innovation due to cultural and organizational barriers
Propositions for Proto-Thinking

• Increasingly science-intensive industries will derive greater value from collaborations with public sector research institutions
  – Greater demand for application-oriented fundamental research
  – Scientific expertise tends to be decentralized and must be integrated by firms
  – BUT expertise can also limit success across competence-destroying innovation
Propositions for Proto-Thinking

• Firms in science-intensive industries will partner with public research institutions to access specific pools of talent and expertise most relevant to the firm’s technology platforms
  – Scientific resources contribute to more efficient and effective search for new options
  – Access to students will aid recruiting of candidates with strategic knowledge and talent
Central Constructs

• “Diversity” in institutional form & purpose

• Science-intensity of technological advance

• Identification and evaluation of scientific expertise and talent
Results of Previous Macro-Study

- Firms are increasing trans-national and trans-institutional research collaborations, regardless of their industry
  - Industrial technology in general is increasingly science-based

- Firms with greater diversity in technology needs (measured by industry-level diversification) are more frequent collaborators
  - Numerous potential confounding and contravening factors

- No strong correlation between firm’s industry and scientific expertise of the partner organizations’ nations
  - Dataset lacks sufficient granularity
Sample Cases of Corporate Collaborative Networks
HP Strategic Technology Platforms

- Digital Commercial Print
- Content Transformation
- Immersive Interaction
- Information Management
- Sustainability
- Analytics
- Cloud
- Intelligent Infrastructure

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IBM’s Open Collaborative Research (OCR) Success

- Industry-leading IP practices create over 45 highly developed research relationships
  - Rice University
  - Indian School of Business
  - UC Davis
  - Carnegie Mellon University
  - Imperial College London
  - Technion
  - University of Dundee
  - Columbia University
  - Tsinghua University

- Recruiting/Talent Pipeline
  - PhD interns and student thesis
  - Academic visitors and employee development
  - RSM hires

- Leveraged external funding sources
  - EPSRC (Engineering and Physical Sciences Research Council)
  - MICRO (Microelectronics Innovation and Computer Research Opportunities)
  - NSF (National Science Foundation)

- 85+ scientific publications & 20+ open source contributions

- Awards
  - 1st Place: ACM CHI Student Research Competition for Interface Metaphor Design and Instant Messaging for Older Adults
  - Service Research Innovation Institute’s Services Partnership Award to Rambam Hospital, Technion and IBM Research

Source: IBM
Monsanto Has an Extensive Alliance Network with Universities & Research Institutions

**Plant Science Research Relationships**
- 90+ U.S. Universities & Research Institutions
- 70+ International Universities & Institutions

**Regulatory Science**
- 70+ Universities and Institutions for Ecological, Product Safety and Product Characterization Studies

**Product Development Field Trials**
- 90+ Universities and Research Institutions in the U.S. and Around the World

Source: Monsanto
Philips Innovation Ecosystem
Implications for Future Research

• Need to improve measurement of technological learning
  – Changes in corporate patent portfolio categorized by technical field
  – Relationship of corporate & non-private patent filings (co-patenting?)
  – Relating bibliometrics to patent data

• Need a better understanding of how firms construct alliance portfolios for research collaborations
  – Moving from ad-hoc to strategic approaches
  – More granular data on public institution research expertise
  – More attention to measures of tacit knowledge exchange (see Ternouth et al)
  – Case studies to look at corporate-level and industry-level practices

• Need to examine antecedents and key success factors in “successful” research collaborations
Some Tentative Observations from Case Research

• Collaboration is NOT a natural behavior in most organizations
  – Researchers tend to socialize and interact within their own discipline or field
  – Attempts to cross organizational boundaries face significant barriers
    • Misaligned incentives
    • Conflicts over governance of resources and processes

• A “community of innovation” is more than a collection of people and assets
  – Requires a process of socialization—with real community involvement
  – Innovation involves risk, which requires trust
  – Communities need commonality
Potential Emergent Model for Successful Public-Private Research Collaborations

Knowledge sharing & exchange

Social capital & affinity

Leadership Governance Incentives

Interaction

Learning processes & communities of learning

Socialization

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