

Discussion

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Open Innovation: Research on Locating
and Incorporating External Innovations

What is OI?

- **Incorporating external innovations**
 - Finding them
 - Integrating them (overcoming NIH)
- **Maximizing value for internal innovations**
 - Appropriability needed if not integrated (Teece 1986)
- **Tied together by business model**



Applications of OI

- **Utilizing external innovations**
 - Firms understand this, fits known trends
 - Particularly like “free” spillovers
 - What are implications for corporation



Levels of Analysis

- **Individual: business models are rare**
- **Firm: strategies, competencies**
- **Value network: interdependencies of business models**
- **Industry: impact of a shock (e.g. new technology)**
- **National: role of policy**



Potential OI Problems (1)

For firms using external innovations

- What is your company's competency (Christensen 2006)
- Difficult for small firms (Laursen & Salter, 2005)
- Need to motivate ongoing supply (West & Gallagher, 2006)
- Attempts by suppliers to capture value may choke off cumulative innovation (Fabrizio 2006)



Potential OI Problems (2)

For firms creating the external innovations (i.e. capturing value from internal innovations)

- **Need to find interested buyers**
 - Cf. Microsoft supplying Windows CE for set-top boxes
- **Extremely dependent on appropriability (Teece 1986; Laursen & Salter, 2005; West and Gallagher, 2006; West, 2006)**
- **Tend towards “winner take all” outcome (cf. Arthur, 1996)**



Potential OI Problems (3)

For both partners to exchange:

- Need both value creation and value capture
- Business model is dependent on entire value network (Chesbrough & Rosenbloom, 2002)
- Modularization means customers or suppliers can encourage competition



Paper Presentations

- **Kira Fabrizio**
 - How do IP rules affect supply of external innovation?
- **Jens Frøslev Christensen**
 - What does the use of OI mean for the 1990s view of core competencies?
- **Keld Laursen and Ammon Salter**
 - Firm and industry factors for innovation openness



Fabrizio: University Science

- How do changes in IP policy affect availability and use of external innovations?
- Are there downsides for too much appropriability?



Findings

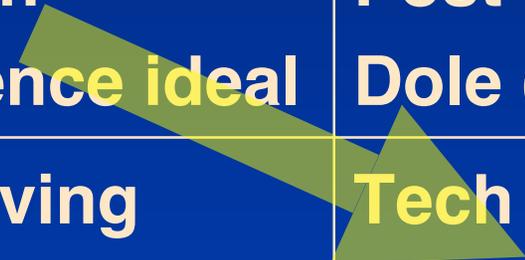
- **Bayh & Dole hoped IP would provide incentives for university tech transfer**
- **Also incentives to slow free spillovers of scientific knowledge**
 - **Impacts cumulative science**
 - **Limits access by non-licensee firms**



End of “Open Science”?

IP ownership

		IP ownership	
		Public (spillover)	Private (university)
R&D funding	Public	Open Science ideal	Post-Bayh Dole (hope)
	Private	Starving scientists	Tech transfer offices



Christensen: Class D Amps

When a discontinuity comes along:

- **Do you build or buy the capability?**
 - Core rigidities constrain decision
 - Can you correct an error?
- **Is there still a value to vertical integration?**



Strategic Alternatives

- Buy innovations on the market
- Acquire external innovators
- Acquire external innovators
- Internally innovate
- Ignore it



Christensen's Classification

Timing	External Focus		Internal Focus	
	Acquisition -based	Partnership/ Licensing-based	Tight system Integration	Closed style
Early/dedicated movers	Texas Instru- ments	STMicro- electronics/ Apogee	Sony	
Early/slow mover				Philips
Late mover		Sanyo		

Firm Response

N=10

Response

	<i>Internal</i>	<i>Acquire</i>	<i>External</i>
<i>Component</i>	fail	success	success
<i>Integrated</i>			fail
<i>Integrator</i>	fail?		success

Competence



Unresolved Questions

- Which strategy is sustainable long-term?
- What path dependencies (culture, core rigidities) constrain OI?
 - How does Sony sustain a differentiation cost structure without differentiation?



Laursen & Salter: Firm Openness

- **Openness as an antecedent to OI**
 - What predicts the attitudes?
 - Is openness determined by appropriability strategies?
- **Key question: how open is open enough? (cf. West 2003)**



Hypotheses

1. Moderate appropriability best suited for openness to external innovation
2. More human capital, more OI
3. Startups with high human capital less open to external innovation
4. More technological change -> more opportunities -> more openness



Findings: H1

Moderate appropriability best suited for openness to external innovation

But:

- **Measure is how hard firms try to appropriate, not how much they are able to appropriate**
- **Some measures suggest weak appropriability**
 - **Trade secrets means that if it's not secret, it's not protected**



Findings: H2

More human capital, more OI

- If you limit to science & engineering, a weaker effect
 - Possible industry interaction effect
- Future research:
 - What impacts use of degrees?
 - Christensen: Sony very different from TI



Findings: H3

Startups with high human capital less open to external innovation

- Possible explanations:
 - L&S: Concern about leakage
 - Business model may be about innovation creation
 - Question of search heuristics/satisficing
- What is the effect size?



Findings: H4

More technological change -> more opportunities -> more openness

Questions:

- **What about innovations that cross industries?**
 - E-commerce created opportunities in retailing
- **Relationship of firm, industry R&D intensity**
 - Raw correlations, industry R&D is significant $p < .001$
 - Test with path model? (or other test of mediation)



Is Openness Determined by Appropriability?

		<i>Appropriability</i>	
		<i>High</i>	<i>Low</i>
<i>Openness</i>	<i>High</i>	pharma	open source
	<i>Low</i>	†	textiles

† Does this case exist? Is it always sub-optimal?



Role of Appropriability

- **Is appropriability exogenous?**
 - Tied to specific technology, policy regime
- **Or can appropriability be created?**
 - Creation of switching costs (Shapiro & Varian, 1999)
 - Layering value on open source (West & Gallagher 2006)



Audience Discussion

For more info, see

www.OpenInnovation.net



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