



Industry/University
Cooperative
Research Centers

Predictors of Graduated I/UCRC Success

Thesis Proposal Research

by

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Overview



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Background: Stakeholder Roles

The I/UCRC Program is designed to:

- Industry:
 - “provide the means to leverage research and development (R&D) investments with multi-university centers renown for their innovative research capabilities.”
- University:
 - “provide opportunities to partner with other leading institutions to conduct industrially relevant research, receive seed funding and recognition as a National Science Foundation (NSF) research center with access to professional resources and guidance aimed towards enhancing global competitiveness.”
- Government:
 - “With industrial and other support totaling 10 to 15 times the NSF investment, I/UCRCs are a premier example of “leveraged” funding--a model for the Federal Government for how to cost-effectively synergize the nation's research and development process.”
(NSF I/UCRC website)
- Program funding timeline
 - Eligible for 5 yrs and an additional 5 yrs

Background: Program Goals

- “The Industry/University Cooperative Research Centers (I/UCRCs) program develops long-term partnerships among industry, academe, and government.”
- “... and a plan to work toward self-sufficiency from NSF”
- “NSF's investment in the I/UCRCs is intended to seed partnered approaches to new or emerging research areas, not to sustain the Centers indefinitely. The Foundation intends for I/UCRCs gradually to become fully supported by university, industry, state, and/or other non-NSF sponsors. “
- “After ten years, the Centers are expected to be fully supported by industrial, other Federal agency, and state and local government partners.”
- “Over 80% of the centers established under the I/UCRC program continue on as successful centers without NSF funding”.

(NSF IUCRC website)

Question

What do we really know about the I/UCRC's track record of producing self-sustaining centers?

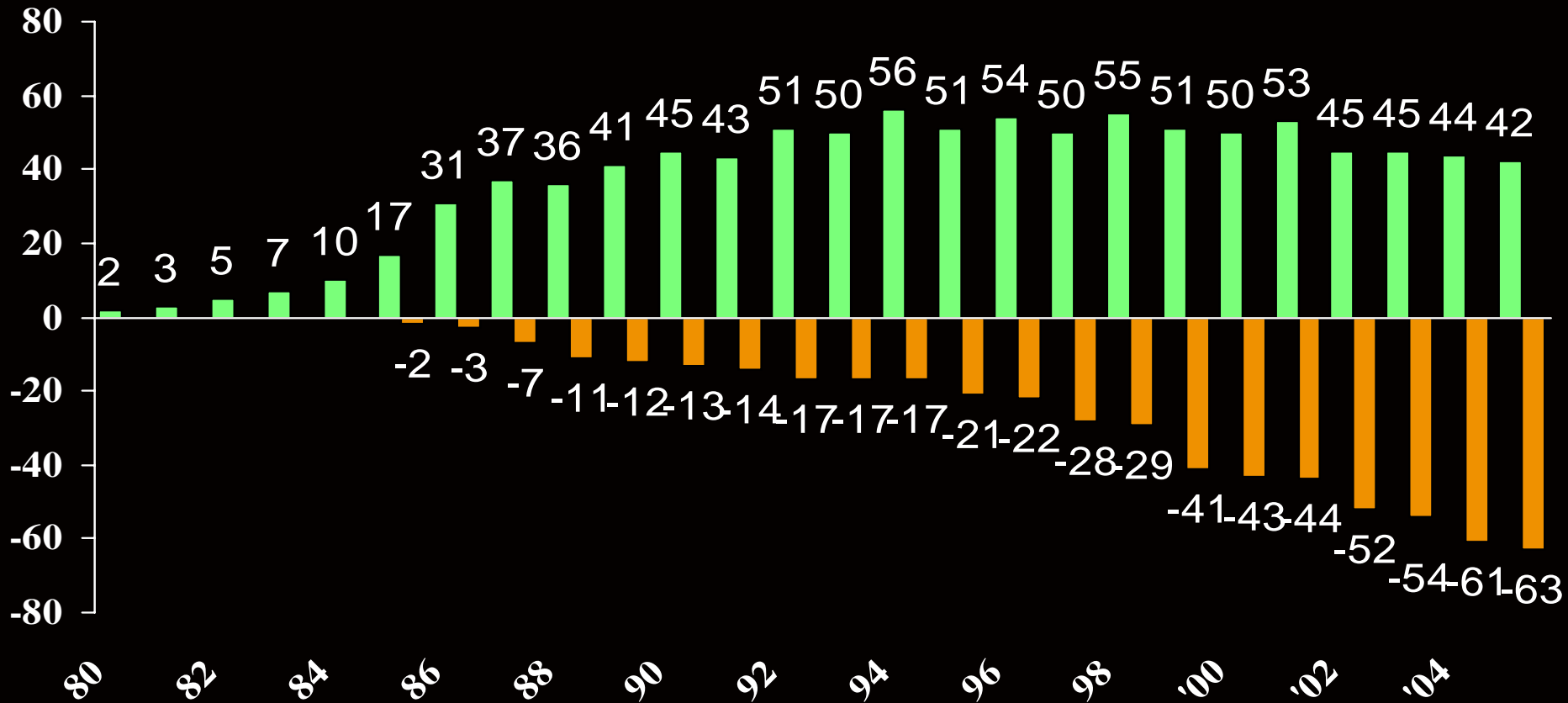
- Lots of archival data while supported by NSF
- No info post-graduation
- Where did that 80% estimate come from?
- What does “success” mean?

What We Know



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Center Life Cycle



Purpose of Research

- To assess the extent to which the I/UCRCs become “successful” after graduation
- To assess the extent to which graduated I/UCRCs maintain fidelity to the I/UCRC model
- To determine what factors predict success post graduation from NSF support

Significance of Research



- Many government programs are designed to provide time-limited support
- Self-sufficiency is an explicit or implicit goal
 - ERCs, STCs, etc.
 - Various S&T and social programs

Literature: Search Strategies



- Library
 - PsychINFO
 - Google Scholar
 - ERIC
 - Keywords:
 - » Education, higher education, postsecondary education, university, industry, research, collaboration
 - » funding, transition, entrepreneurship, social entrepreneurship, sustainability, self-sustainability, fidelity
- Networking
 - NSF
 - SRI
 - ERC
 - I/UCRC

Theoretical/Conceptual Literature: Social Entrepreneurship (Dees, 2001)



- Social entrepreneurs play the role of change agents in the social sector, by:
 - Adopting a mission to create and sustain social value (not just private value), recognizing and relentlessly pursuing new opportunities to serve that mission, engaging in a process of continuous innovation, adaptation, and learning, acting boldly without being limited by resources currently in hand, and exhibiting heightened accountability to the constituencies served and for the outcomes created.
- I/UCRCs bridge the gap between industrial and academic sectors, by:
 - Adopt a mission to create and sustain industrial collaboration, recognizing and relentlessly pursuing opportunities to develop collaboration, engaging in a process of continuous innovation, adaptation, and learning, acting boldly without being limited by resources currently in hand (i.e. pursuing additional funding sources), exhibiting heightened accountability to the industry, faculty, and university served and for the technology and knowledge transfer deliverables



Empirical Literature: Study 1

(Ailes, Roessner, & Coward, 2000)

- Goals: To explore issues of self-sustainability, funding, cultural change for graduated ERCs
- Methodology
 - Interviews with Center leadership
 - Centers from 5 cohorts, 1985-1990, N = 16
 - Data collected year before graduation and year of graduation (11th year)
 - Study is on-going, began in 1997, last published in 2000
 - Primarily descriptive
- Results
 - Factors: Strategic planning, Facilities / Institutional Support, Industry priorities affect funding and research
 - Outcomes: All centers survived as research entities to some extent, ' , Fidelity to ERC model varied, Changes in research focus, Negative effects
 - Hypotheses: Infrastructure, Transition planning, Center management, Faculty involvement, Institutional factors, Research area, Industrial participation, Educational programs
- Critique
 - No stats
 - Sample size
 - Findings based on judgment
 - Applicability to the I/UCRC Program



Empirical Literature: Study 2

(Mujumdar, 2005)

- Goals
 - Investigated what happened to ERCs after graduation, how center's changed, and the consequences of graduating from NSF support.
- Methodology
 - 22 item survey
 - N = 10, response rate = 62.5%
 - Range \$500K - \$27M
 - Cohorts 1985-1990, follow-up to Ailes et al. (2000) study
- Results
 - Sources of Funding: University (75%), Industry (100%), Government (63%), Other (89%)
 - Mission/Vision
 - Tech Transfer
 - Research
 - Education/Outreach
 - Pros/Cons
 - Suggestions/Improvements
- Critique

Empirical Literature: Case Studies / Strategies



- ERCs approaching graduation have used some of the following strategies to achieve self-sufficiency
 - Transition Planning
 - Infrastructure development
 - Fundraising, Participation of PIs in fundraising
 - Incentives – start-up companies, targeted funding, plans for industry
 - Investment in technology transfer
 - Increase Industry support – membership drive, increased fees, project specific funding
 - Research – industry driven, diverse, focused
 - Cost sharing with universities
 - Marketing IP – establishing an IP protection board
- (Sander, 2004; EBSM, 2005, Moudgil, 2005; Lee, 2005)
- CDADIC I/UCRC (Ringo, 2006)
 - Business model, venture capital, strategic planning, networking w/ other graduated Centers, embrace change, include graduated Centers in annual meetings

Summary

Making due with what you've got...

Literature is sparse and primarily non-empirical

- University Factors
 - IP policy
 - Facilities
 - Funding
- Industry Factors
 - Fit with Center
 - Value Center membership
 - Outsourcing R&D
 - Power
 - Long-term research goals
- Center Factors
 - Visibility/Prestige
 - Strategic planning
 - Students
 - Research area
 - Caters to Stakeholders
 - Mission
 - Funding
 - Leadership
 - Faculty
 - Technology Transfer

Research Goals



- What is the Status of graduated I/UCRCs?
- How “successful” are graduated I/UCRCs?
How do you measure success?
- To what extent do pre-graduation archival data predict success?
- What transition strategies do Centers use to manage graduation? To what extent does transition strategy predict success?

Methods....

A Work-in-Progress



- Mixed Methods
 - Quantitative Archival Data
 - » P/O Reports
 - » Director Reports
 - Qualitative interviews
 - » Evaluators at time of transition
 - » Current Directors
- Sample
 - Graduated I/UCRCs
 - N = 63
 - No control group...
- Data Collection
 - Archival Data
 - Phone interviews

Dependent Variables



- “Perhaps the strongest indication of the value of these Centers to industry is the continued and growing participation of industry, even during periods of economic fluctuation.”
- “To industry, it is *results* that count. Evaluator surveys show that industry is satisfied with the results of I/UCRC membership--not just in terms of new products and processes (as described in the accompanying fact sheets), but also in terms of access to the best new ideas and first-rate prospective employees. Their enthusiastic participation and support are the proof of their satisfaction.”

(NSF I/UCRC website)

- Measures of Post-graduation Success
 - Center Status on NSF I/UCRC membership criteria (categorical)
 - » Exceeds NSF requirements, Meets NSF requirements, Does not meet NSF requirements
 - Status change post-graduation (categorical)
 - » Improved since graduation, No change since graduation, Declined since graduation, Closed
 - Fidelity (continuous)
 - » Degree to which the center maintains I/UCRC characteristics
- Data collected via Director and Evaluator interviews

Independent Variables



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- Financial Status
- Infrastructure
- Transition planning
- Leadership
- Faculty
- Institutional characteristics
- Research
- Industrial characteristics
- Educational programs

Measures



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- Archival Data
 - Director Reports
 - P/O reports
- Director Interviews (qualitative and categorical)
 - Budget and membership
 - Research activities
 - Fund raising activities
 - Employment status
 - Industry experience and contacts
 - Personal reflections - exploratory
 - Existence of a strategic transition plan
- Evaluator Interviews (qualitative and categorical)
 - Strategic plan
 - Quality of membership recruitment activities
 - Industry exit interviews
 - Personal reflection – exploratory

Timeline



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June, '06 | July-Sept., '06 | Oct.-Nov., '06 | Jan., -Feb., '07 | March, '07 | April-June, '07 | July-Aug., '07

- Approved 
- Extended Lit Review 
- Archival Data Cleaning 
- I/UCRC Approval, Sample Identification 
- Proposal 
- Data collection 
- Analysis and Reports 