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# ***THE ROLE OF ORGANIZATIONAL BOUNDARY SPANNERS IN INDUSTRY/ UNIVERSITY COLLABORATIVE RELATIONSHIPS***

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*&*

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# *OVERVIEW...*

## *ISSUES OF CONCERN*



- **KEY ISSUES:**

- **Increased partnerships between I-U** suggest university research has an important impact on the operations of firms in the private sector.
- **Firms vary tremendously in reported benefits**
  - » Firms benefit in aggregate, but the number of Center-stimulated projects decreases by HALF when looking at firms who report at least one project... 50% report NONE!
  - » The underlying cause of the variation in benefits is yet unknown. (Ailes, Roessner & Feller, 1997)
- **Multiple Factors Probable**
  - » Activities and effectiveness of individuals rationally seem to be important factors
  - » Different roles played by IAB members may affect firm benefits, which in turn affect center outcomes

# IAB ACTIVITIES



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## Industrial Advisory Board (IAB) as Boundary Role Incumbents:

- Primary function: represent interests of the firm within the center.
  - Review/ evaluate proposed and ongoing research
  - Gatekeeper
  - Vote on matters that affect policy or research
  - Attend semi-annual meetings
  - Transfer technology and research back to the organization
- ✓ A primary reason for not getting benefits from a center was, *“my fault, we didn’t work hard enough at it”* (Ailes, Roessner & Feller, 1997,2001)
- ✓ However, There is a knowledge deficit regarding the role of *Boundary Role Incumbents* (*“Boundary Spanners”*) in inter-organizational partnerships. Their roles and responsibilities have not been consistently observed or measured...

## Research & Theory Indicate Multiple Roles:

- ✓ IAB members engage in at least 3 primary roles...
- **R&D Management** : Representational
  - **Boundary Spanning** : Information Processing
  - **Technology Champion**: Output Disposal

# METHODOLOGY OVERVIEW



- **Research Objective:** To increase knowledge & understanding of the role(s) and behaviors of a boundary spanning IAB representative and their impact on vital outcomes associated with I/U center research.

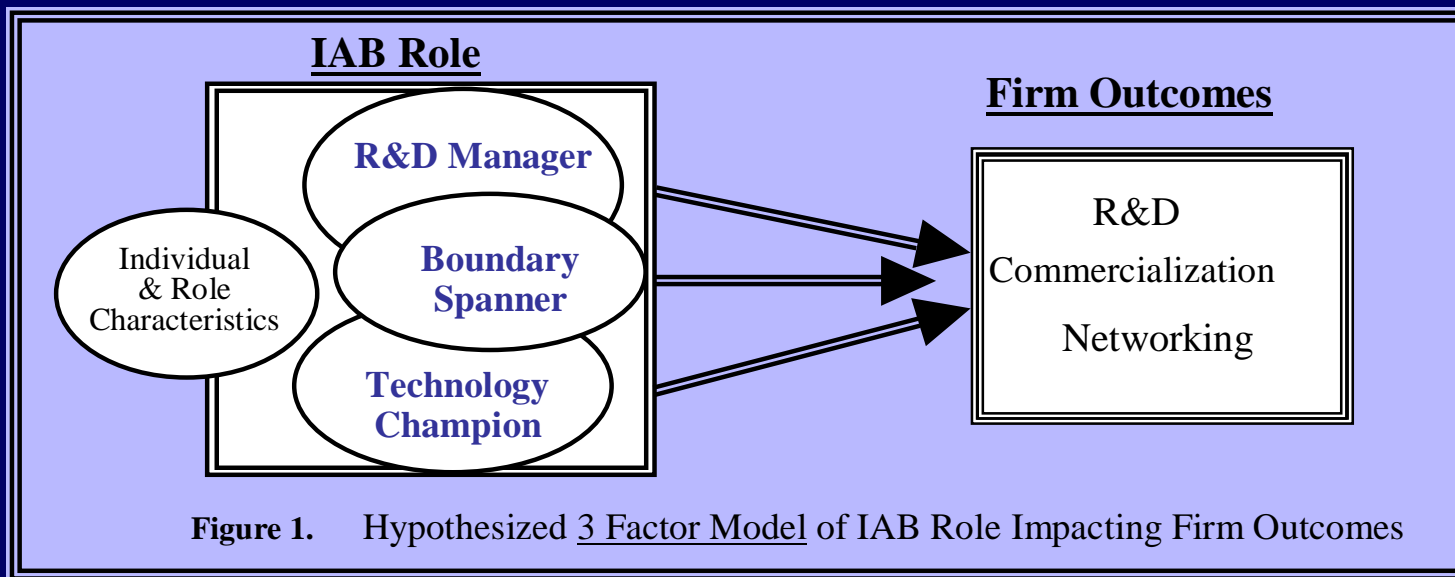


Figure 1. Hypothesized 3 Factor Model of IAB Role Impacting Firm Outcomes

- **Research Design:** Cross Sectional Survey
- **Population:** IAB Rep's from National & State IUCRC's
- **Time Frame:** Survey Administration March 15 – July 8, 2004
- **Measure:** National IUCRC Process/Outcome & IAB Supplemental Role Survey  
» Paper & Web Versions

# IAB ROLE MEASURES

*Survey (Paper & Web versions available)*



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Instructions:		FREQUENCY "I ____ do this task."					IMPORTANCE "This task is an ____ part of my IAB role."										
		Never	Rarely	Occasionally	Sometimes	Often	Very Often	Unimportant	Somewhat Imp.	Important	Very Important	Crucial					
External Boundary Span	1)	Excluding Center meetings, have contact with Center investigators (e.g., PI's, faculty, post docs, and students).					0	1	2	3	4	5	1	2	3	4	5
	2)	Make recommendations to PI's to change or modify Center research projects that are in progress.					0	1	2	3	4	5	1	2	3	4	5
Basic IAB	3)	Attend research presentations given at the Center.					0	1	2	3	4	5	1	2	3	4	5
	4)	Read Center research reports.					0	1	2	3	4	5	1	2	3	4	5
Internal Boundary Span	5)	Distribute Center research documents (e.g., reports, abstracts, etc.) to others within your workgroup.					0	1	2	3	4	5	1	2	3	4	5
	6)	Distribute reports that you prepared in which you synthesized or summarized Center research, projects, ideas, or outcomes to others within your workgroup.					0	1	2	3	4	5	1	2	3	4	5
Technology Champion	7)	Advocate for/ secure resources for new Center-stimulated research projects and commercialization efforts in your organization.					0	1	2	3	4	5	1	2	3	4	5
	8)	Overcome obstacles (e.g., budget constraints, standard operating procedures, bureaucracy) to get a Center-stimulated research project or commercialization effort started in your organization.					0	1	2	3	4	5	1	2	3	4	5

# *Research Questions*



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- What does the IAB role look like?
- What factors (individual characteristics, general role, IAB roles) predict firm benefits?
  - R&D benefits
  - Commercialization benefits
  - Networking/recruiting benefits

# ANALYSIS PLAN



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## Response Rates:

- ✓ Center Participation Rate  $35/45 = 78\%$
- ✓ Survey Response Rate  $231/497 = 46\%$
- ✓ Analysis Population ( $n = 220$ )

## Statistical Analysis:

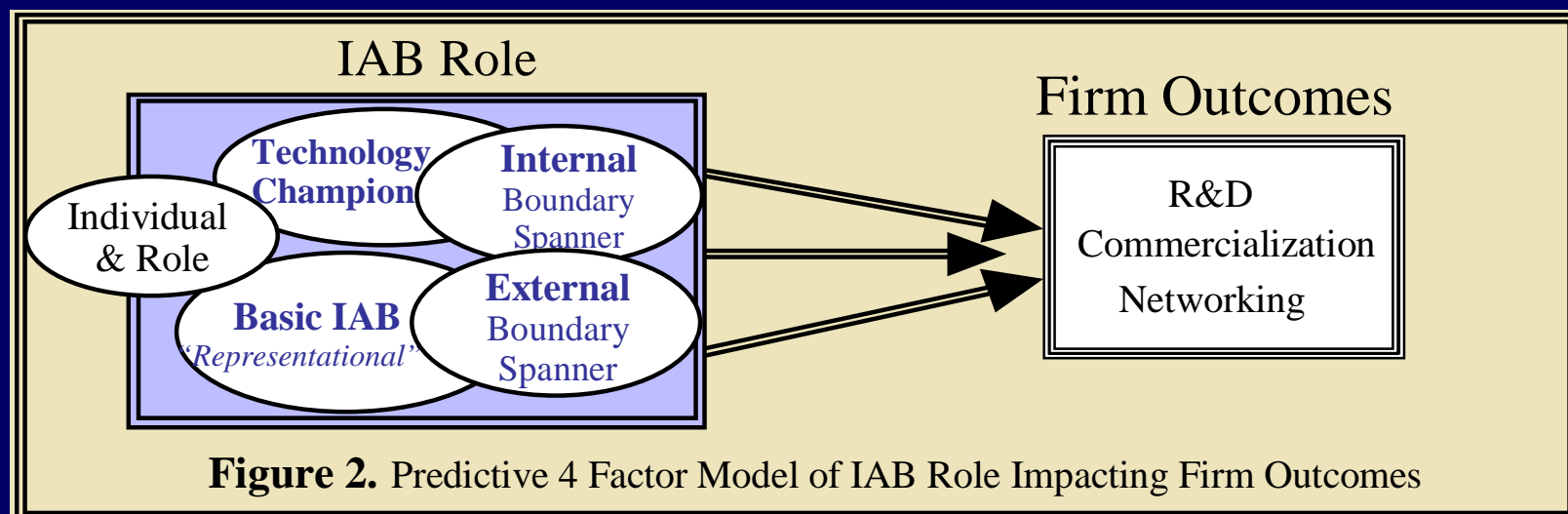
- **Univariate Analysis-** normality, skewness, kurtosis
- **Factor Analysis**
  - » **Creation of Role Scales** (15 items)
    - » Hypothesized 3 factors (R&D Manager, BS, & TC)
    - » Average ratings across high loading items
  - » **Creation of Research Relevance Index** (3 items)
    - » Additive index of standardized scores
- **Predictive Analysis: Trimming Approach**
  - **Bivariate Analysis-** multicollinearity
  - **Domain Level Analysis-** predictive
  - **Multivariate Analysis-** predictive

# IAB ACTIVITIES: A FOUR FACTOR MODEL

- EFA distinguished 4 factors not 3 as hypothesized
- CFA confirmed 4 factor model fit:
  - » Basic IAB Role (3 items),
  - » Internal BS (within firm) (4 items);
  - » External BS (center faculty) (5 items);
  - » Technology Champion (3 items)

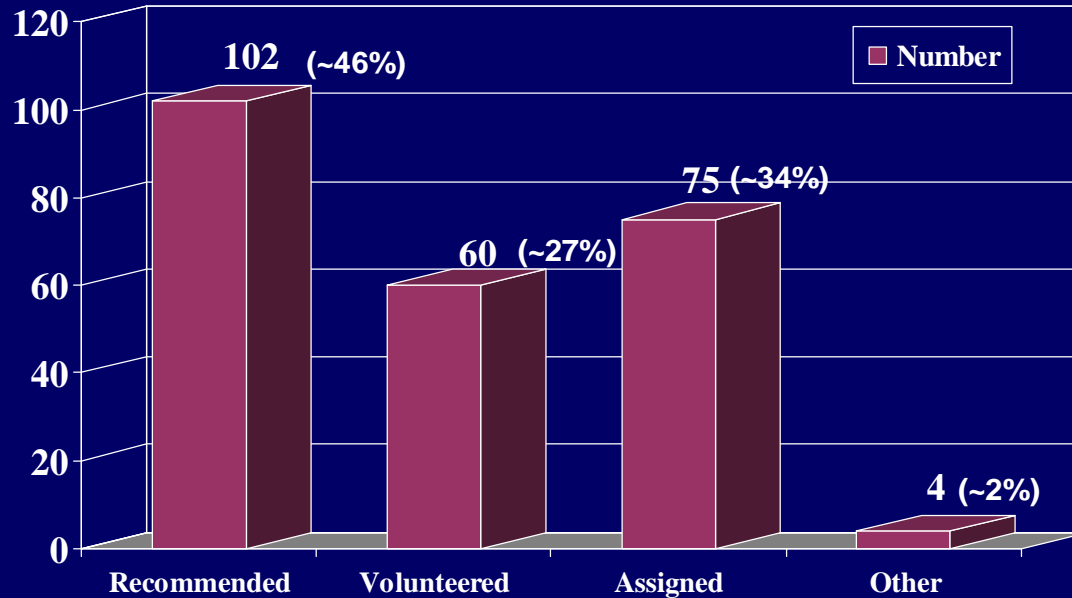
## CFA 4 FACTOR MODEL FIT:

AGFI	.86
CHI SQ	175.66
CHI SQ-df	84
RMSEA	.07
CFI	.94
NNFI	.92
Hoelter's N	134

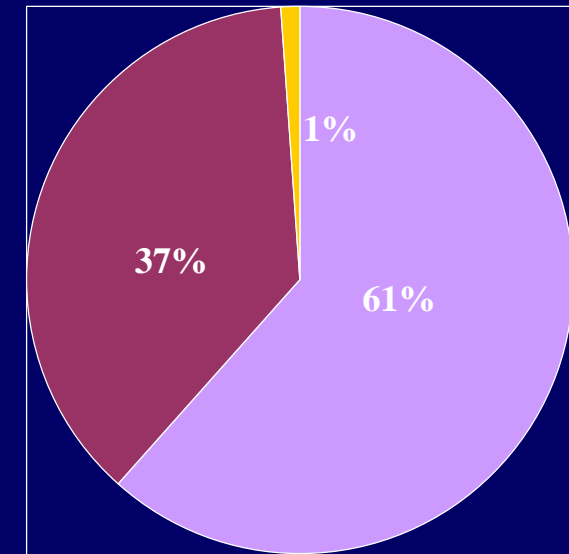




# GENERAL IAB ROLE CHARACTERISTICS



**How They Got Involved**  
*(Multiple Response Option)*



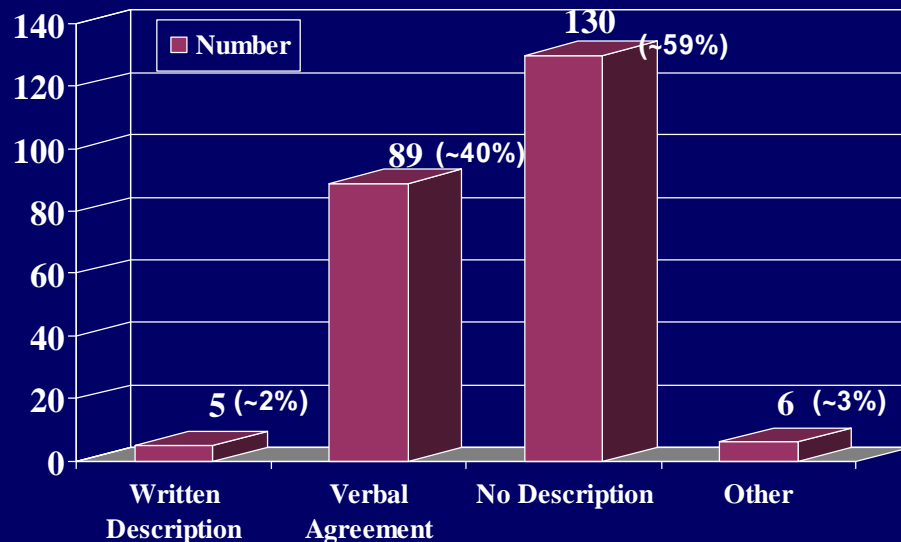
**IAB Representation**

- ✓ Approximately 73% said they either recommended the firm join the Center or volunteered to represent the firm to the Center.
- ✓ The majority of IAB representatives (61%) are the sole firm rep.

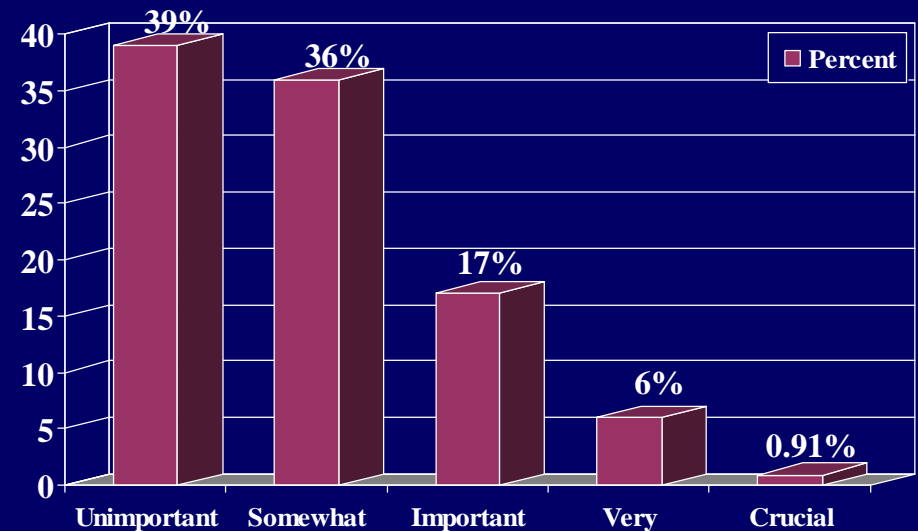
# GENERAL IAB ROLE CHARACTERISTICS



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**Formality of IAB Role**  
*(Multiple Response Option)*



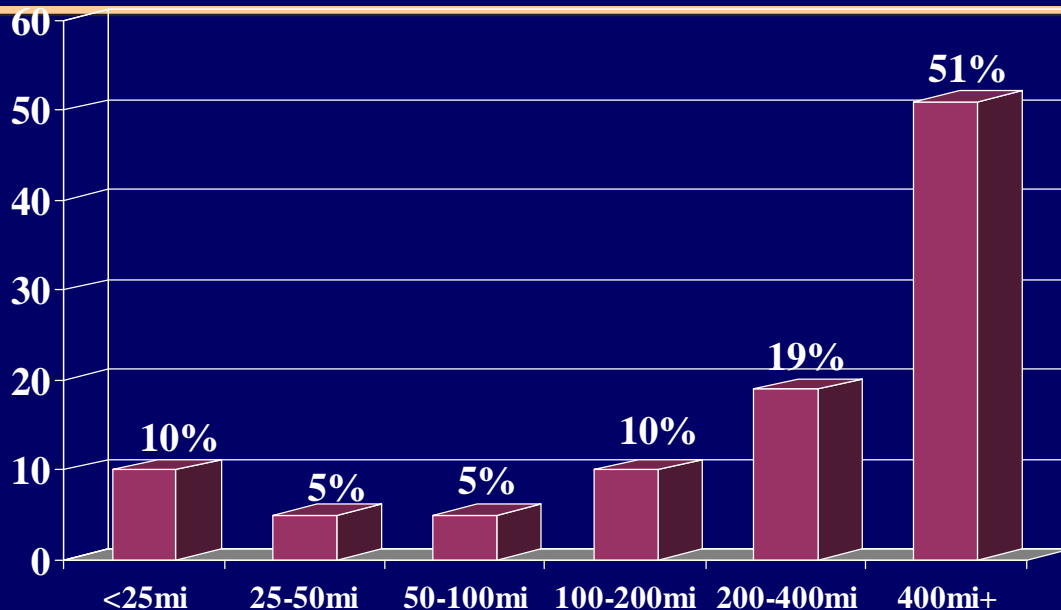
**How important is the performance of this research Center for your formal performance appraisal?**

- ✓ Although approximately 60% say there is no description of their role as an IAB member, approximately 24% also report that the performance of the center is important, very important or crucial to their formal performance appraisal.

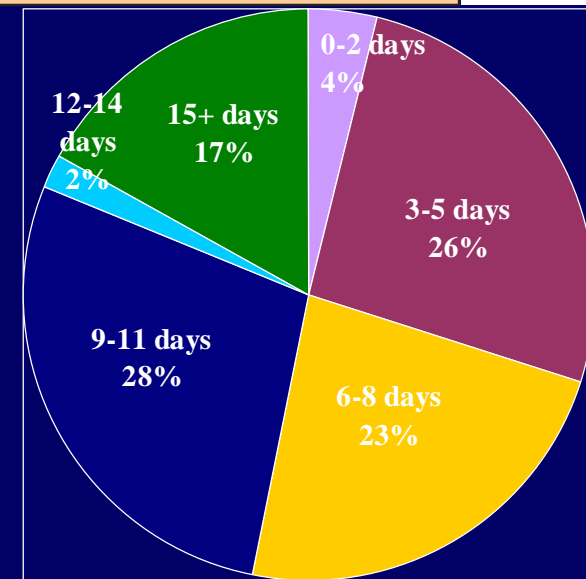
# GENERAL IAB ROLE CHARACTERISTICS



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**How far is your primary work location from the university research center?**



**How many days they spent on Center related activities**  
*(includes center meetings)*

- ✓ Although over half (51%) of IAB are geographically located more than 400 miles from the Center, 47% report working 9 or more days on Center related activities. *(Note: IAB only required to attend bi-annual meetings- approximately 6 days or less per year)*

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# RESEARCH QUESTION

*To what extent do the significant role activity scales predict outcomes over & above the significant individual & general role characteristics?*

**Table 14. Multivariate Results**

Variables:	Dependent Measures						
	Logistic Regression (log-odds)					OLS Regression (b)	
	R&D	Commercial-ization	Professional Networking	Students Hired		Dollar Value	Research Relevance
<u>Individual Characteristics</u>							
Age (#51)	--	--	--	--		0.14*	--
<u>General Role Characteristics</u>							
IAB Tenure (#7)	--	NS	NS	--		--	--
Distance from Center (#54)	--	--	--	0.80*		--	--
Performance Appraisal (#5)	NS	1.4*	NS	--		--	0.19**
Size Budget (#6)	NS	NS	--	--		0.17**	--
Hours Worked Week (#9)	--	NS	--	--		--	--
Days Travel for Work (#10)	--	--	--	0.50*		--	--
<u>Role Scales</u>							
Basic IAB Representation	--	--	1.3*	--		--	--
Internal Boundary Spanner	1.7*	--	--	--		--	0.13*
External Boundary Spanner	1.9***	1.5**	2.0***	1.6**		0.28***	0.15*
Technology Champion	1.8***	1.3*	--	--		--	0.27***
<b>Chi Square <math>X^2</math></b>	<b>65.68***</b>	<b>39.03***</b>	<b>40.36***</b>	<b>18.47***</b>	<b>F=</b>	<b>32.65***</b>	<b>26.38***</b>
<b>Analog <math>R^2</math></b>	<b>12%</b>	<b>8%</b>	<b>7%</b>	<b>8%</b>	<b><math>R^2</math></b>	<b>15%</b>	<b>33%</b>
<b>Chi Square <math>X^2</math></b>	<b>18.02***</b>	<b>20.56***</b>	<b>5.71*</b>	<b>11.27**</b>	<b>F=</b>	<b>8.91***</b>	<b>38.30***</b>
<b>Analog <math>R^2</math></b>	<b>3%</b>	<b>4%</b>	<b>2%</b>	<b>5%</b>	<b><math>R^2</math></b>	<b>8%</b>	<b>15%</b>

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

# *MULTIVARIATE RESULTS: R&D*



## **R&D (impact, dollars, relevance): Factors that make a difference**

- **Internal BS Role\*\***
- **External BS Role (only role sig for dollar value)\*\***
- **Tech Champion Role\*\***

# ***MULTIVARIATE RESULTS: COMMERCIALIZATION***



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## **COMMERCIALIZATION: Factors that make a difference**

- **Accountability on formal performance appraisals\*\***
- **External BS Role\*\***
- **Tech Champion Role\*\***

# ***MULTIVARIATE RESULTS: NETWORKING***



## **PROFESSIONAL NETWORKING (impact, students)** **Factors that make a difference**

- **Number of days travel for work (students hired)\*\***
- **Distance from the center (students hired)\*\***
- **Basic IAB Representative Role (impact)\*\***
- **External BS Role\*\***

# *External Boundary Spanner*



- What does an external BS do?
  - Hold discussions ...faculty to develop proposals consistent with our goals
  - Propose research ideas/topics for center researchers to pursue
  - Make recommendations to PIs to change modify research projects that are in progress
  - Excluding center meetings, have contact with Center investigators (e.g. faculty, students, post docs)



# *PRELIMINARY SUMMARY & CONCLUSIONS...*



✓ *First time anyone has attempted to produce an accurate description of IAB roles and activities*

✓ Findings:

– Descriptive

» Intriguing Profile

» Informal; Pro-active, Geographically distant, etc.

» Confirms four main roles

– Predictive: What IAB do makes a difference

» IAB roles explain most of the variance

» All four make some impact

» External BS role appears to be the most powerful

Being proactive within the center makes a difference

» Need to explore individual activities

» Lot of variance not explained by individual factors

# ***STUDY BENEFITS***



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ü Increase scholarly understanding of organizational  
*Boundary Spanners*

ü Guidance for firms participating in Industry-University  
Research Centers seeking to maximize firm outcomes

- *R&D,*
- *Commercialization,*
- *Professional Networking*

ü Contribute to Best Practices in Human Resources for firms  
participating in Industry-University Research Centers

- *Selection,*
- *Training,*
- *Motivation*