Industry/University Cooperative Research Centers

Highlights of Membership and Process/Outcome Data

FY 2006-2007

IUCRC Evaluator's Meeting
June 12, 2008

Denis Gray, Andrea Lloyd,

& Lindsey McGowen

North Carolina State University

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Industry/University Cooperative Research Centers

MEMBERSHIP REPORT DATA

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Take Home Message

Industry/University Cooperative Research Centers

- Tracking "membership" is important because it may be the most important measure of success for centers and the IUCRC program
- But…
  - We need to be very careful in interpreting changes in membership overtime

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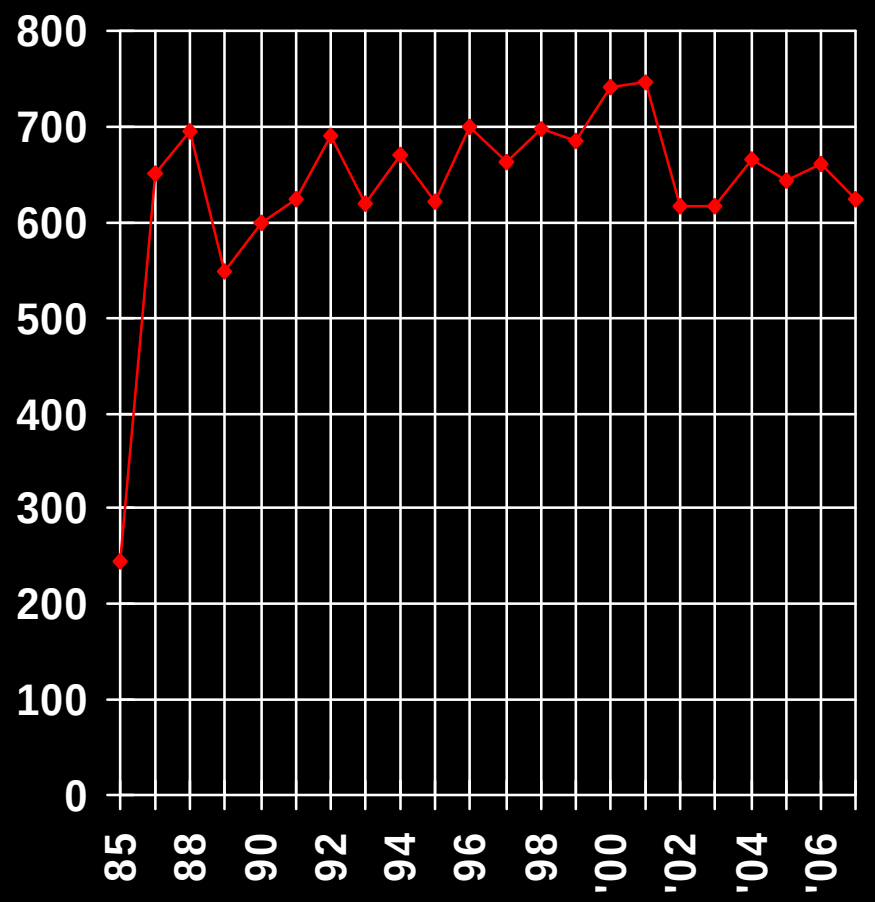
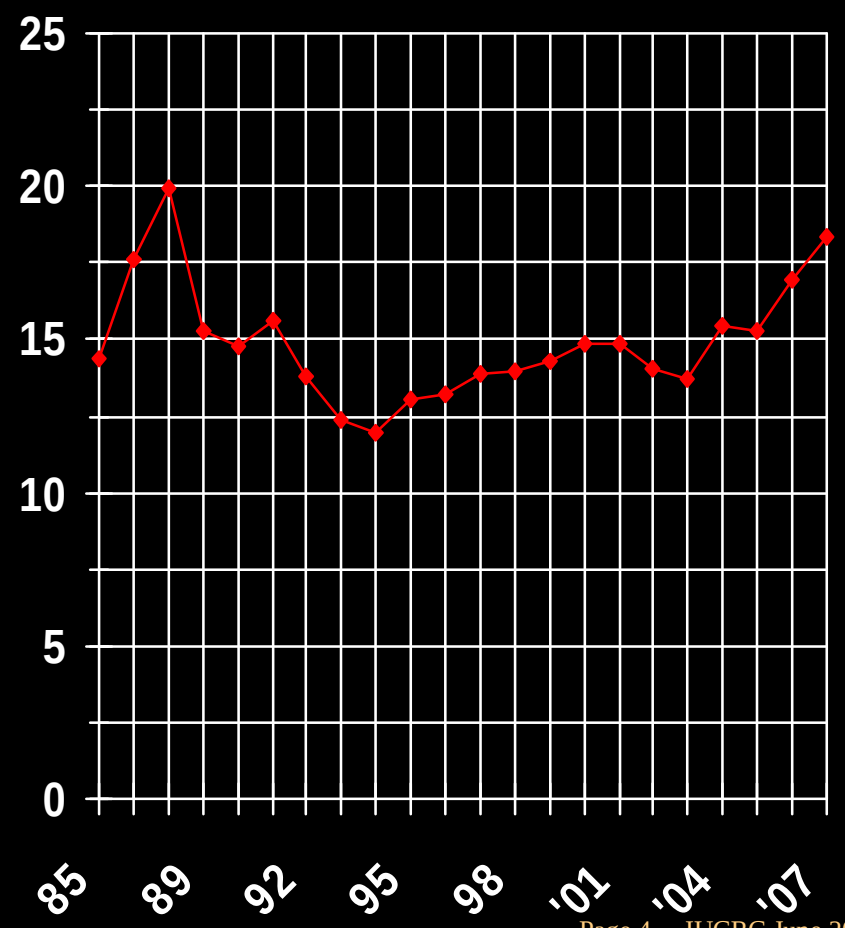
INDUSTRIAL MEMBERSHIPS BY YEAR

Industry/University Cooperative Research Centers

TOTAL NUMBER OF MEMBERS



AVERAGE NUMBER OF MEMBERS PER CENTER



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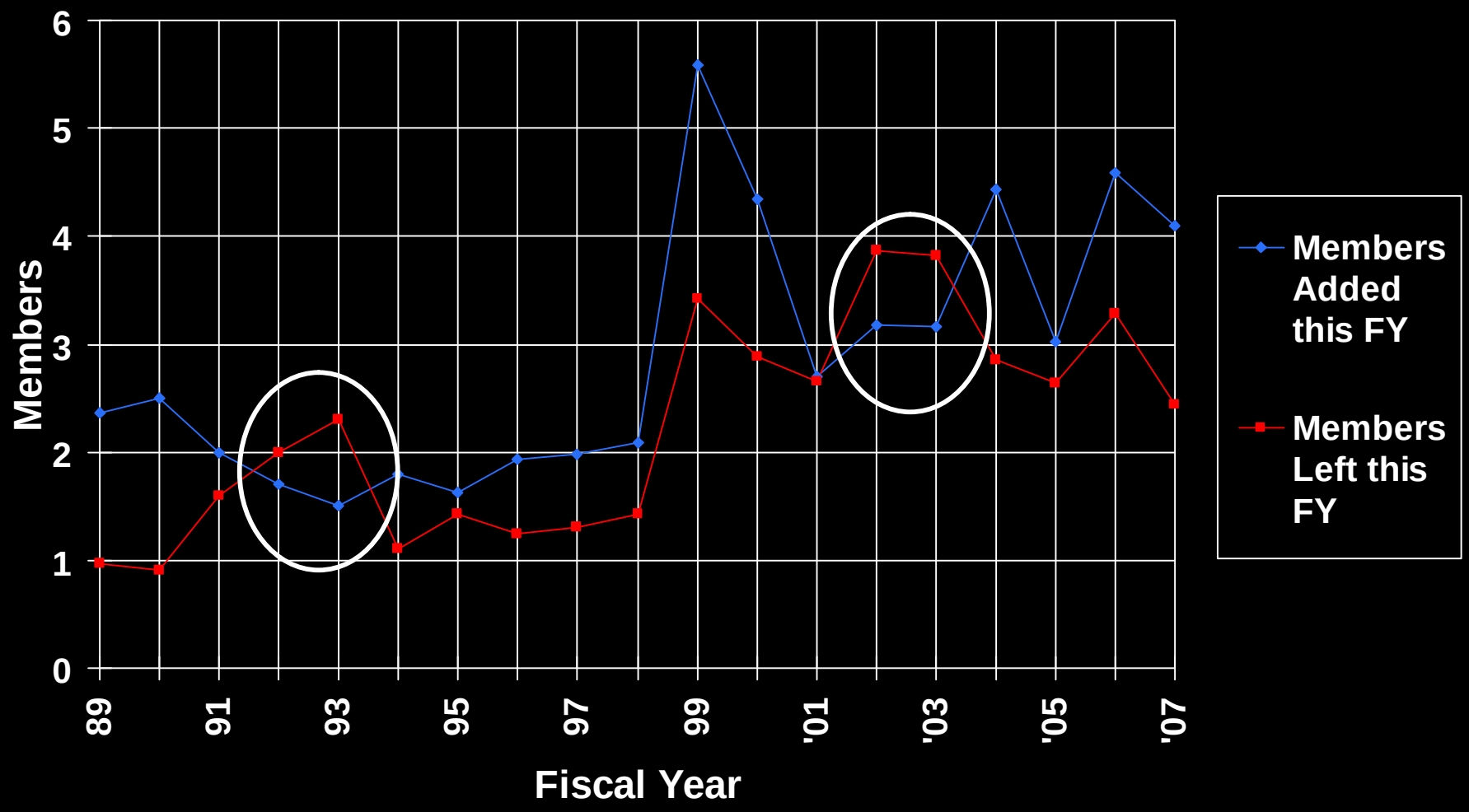
AVERAGE MEMBERSHIP TURNOVER

Industry/University Cooperative Research Centers



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Center Director Membership Summary

Industry/University Cooperative Research Centers

	Count	Percent
Total memberships	*623*	*100%*
Industry: large firms (500 + employees)	405	65%
Industry: small firms (< 500 employees)	111	18%
US Government: Federal	78	12.5%
US Government: State or local	17	2.5%
Non-Profit	10	1.7%
Other	2	.3%
Number of organizations with memberships	*431*	--

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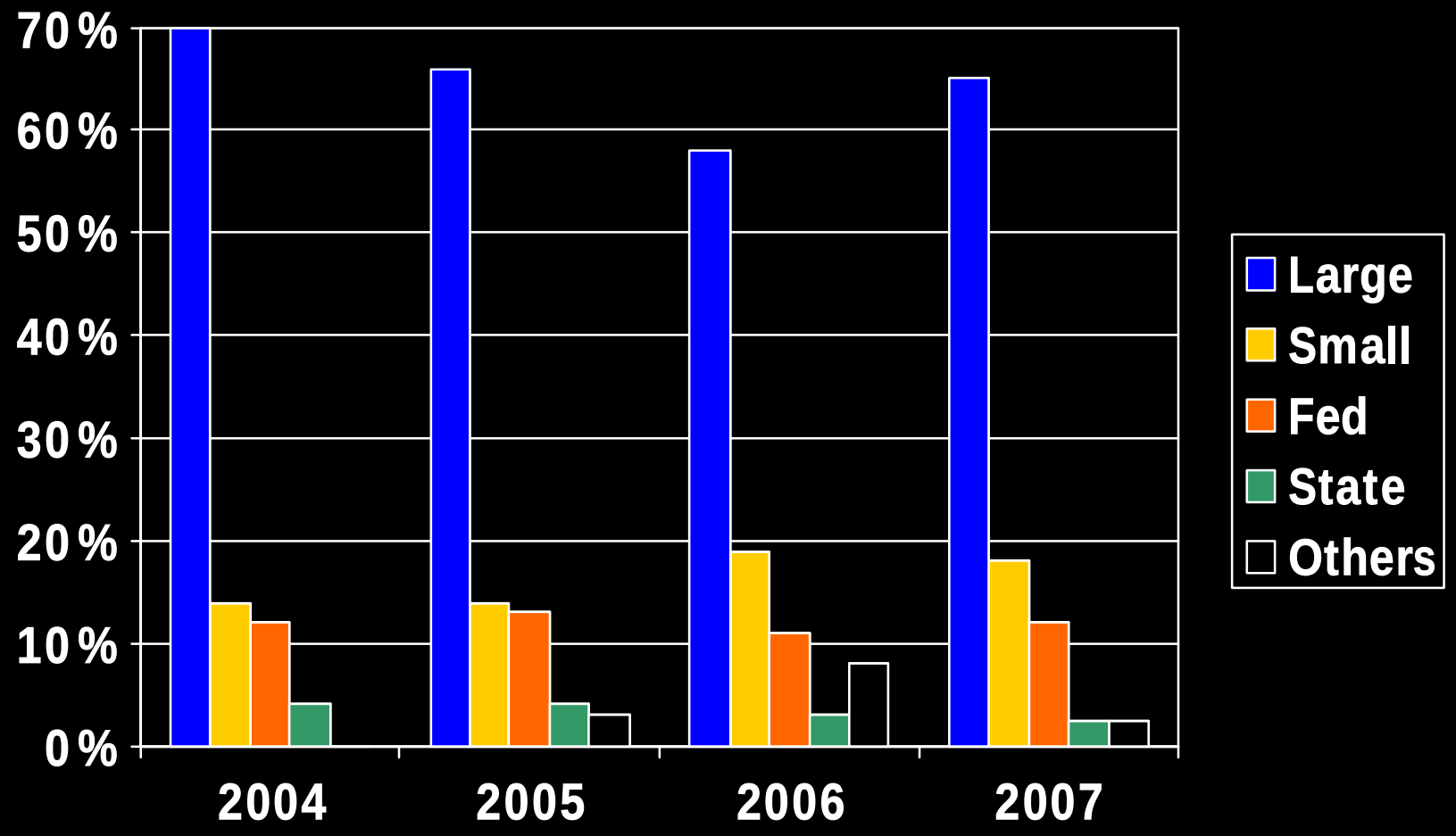
Member Composition 2002-2007

Industry/University Cooperative Research Centers



[1] Categories comprising other include: non-profit, non-US government, and other organization

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Membership: Organizations with the Most Memberships

Industry/University Cooperative Research Centers

Number of Memberships	Organizations
18	U.S. Army
13	Dept of Energy/ Nat'l Labs
12	Boeing
11	General Motors
8	Intel Corporation, Lockheed Martin
7	GE, NASA, U.S. Navy, Raytheon
6	IBM*
5	Fed Aviation Admin*, Ford*, Honeywell, Siemens, Toyota, U.S. Air Force
Dropped	*Samsung*

** Indicates an Organization new to this list*

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Government Members

95 memberships, 39 organizations

Industry/University Cooperative Research Centers

- Air Force
- Army
- Center for Advanced Engineering Research
- City of Columbus (OSU)
- City of Phoenix
- City of Scottsdale
- City of Tempe
- Counterintelligence Field Activity
- County Sanitation Districts of Los Angeles County
- Defense Academy for Credibility Assessment
- DHS - Transportation Security Administration
- DoD
- DoE
- Federal Aviation Administration
- Federal Bureau of Investigation
- Federal Transit Administration
- Knolls Atomic Power Laboratory
- NASA
- National Cancer Institute/SAIC
- National Highway Traffic Safety Administration
- National Reconnaissance Office
- National Science Foundation
- National Security Agency
- Navy
- Nebraska Dept. of Economic Development
- NIST
- North Carolina Department of Transportation
- Office of Secretary of Defense
- Oklahoma City Air Logistics Center
- Oklahoma Department of Transportation
- Orange County Sanitation Districts
- OSU Information Technology (OSU)
- Philadelphia Water Department
- Pima County Wastewater Management Department
- Town of Marana
- Tucson Water
- USDA Forest Service Research
- USDA Forest Service State and Private
- USSOCOM/SOAL-T

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Single vs. Multi-Site Members

Industry/University Cooperative Research Centers

	Single	Multiple
Count of Centers	11	22
Count of Sites	11	63 (~2.24 per center)
Members	151	472
Avg per Center	13.7	20.5
Avg per Site	--	7.5
Lost members 2006	16	67
Avg per Center	1.5	2.9
Avg per Site	--	1.1
Recruited members 2006	32	153
Avg per Center	2.9	6.7
Avg per Site	--	2.4

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Conclusion and a caution …

Industry/University Cooperative Research Centers

- Membership looks pretty healthy but…
- All our interpretations of membership changes over time are suspect
  - Because they are affected by factors operating at multiple levels of analysis

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Industry/University Cooperative Research Centers

IUCRC Evolution

NSF-IUCRC Program Composition 2002 – 2006

Prepared by Drew Rivers, NCSU

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Overview

Industry/University Cooperative Research Centers

- Current Structural Report provides annual counts of program centers and members
- However, changes from year-to-year are more complicated than previously considered
- This document summarizes the evolution of the IUCRC program at the Center-, Site-, and Member-level from 2002 - 2006

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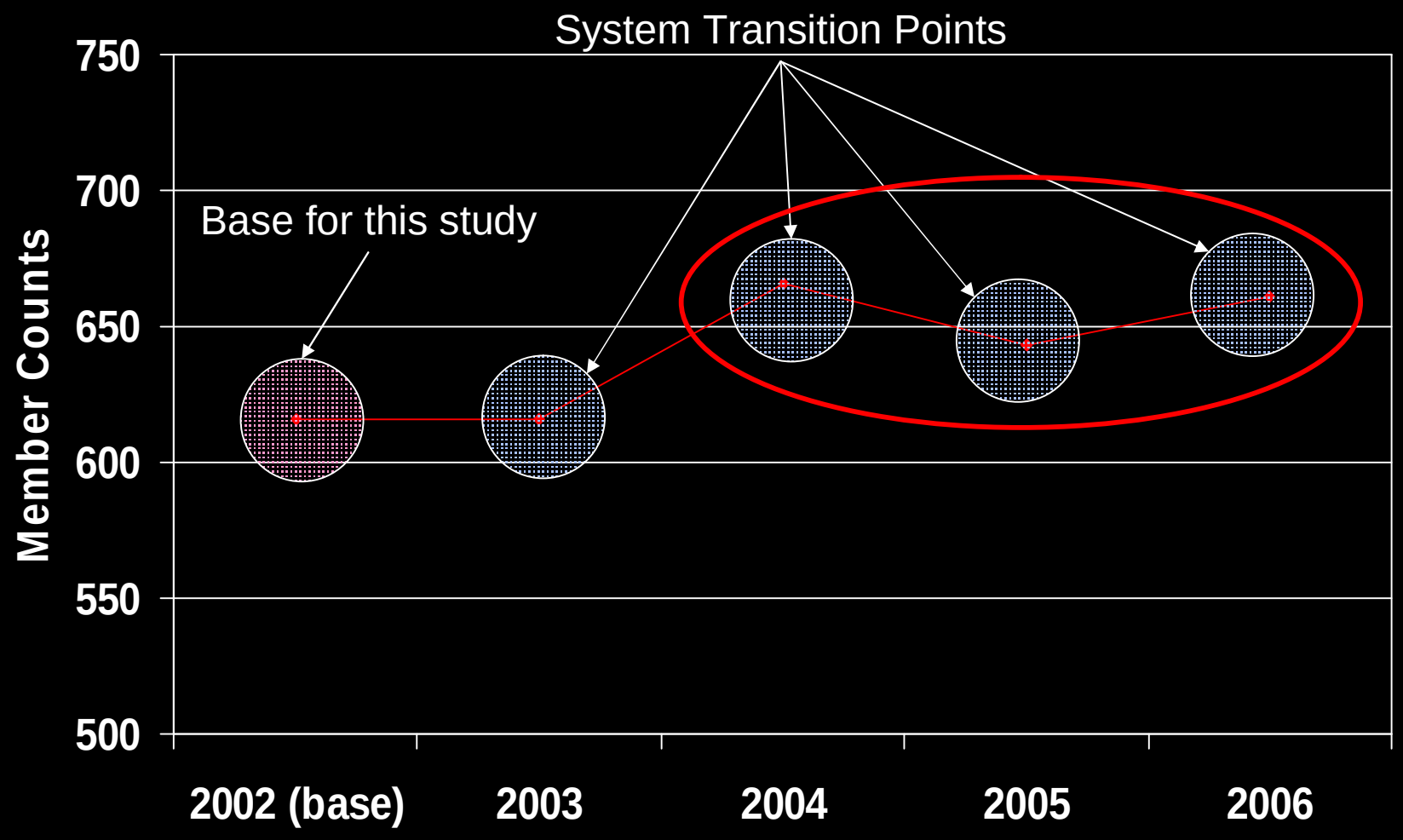
Trend in Member Counts, By Year

Industry/University Cooperative Research Centers



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Interpreting Membership Changes Over Time

Industry/University Cooperative Research Centers

- Changes in membership numbers over time are influenced by changes at different levels:
  - Centers: mature centers will graduate (and their members will be dropped) and new centers will be created (and their members added).
  - Sites: Generally speaking, new sites are added to existing centers.
  - Members: Individual members will leave a center and new members will be added.
- Changes in program total and average can be due to any combination of these factors.
  - Totals are particularly unstable
  - Ex: In 2006-2007 8 centers graduated

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2005 IUCRC System Changes

Industry/University Cooperative Research Centers

2004

43 Centers
91 Sites
666 Members

Note: Rows are mutually exclusive

Level of Change		Impacts		
		Ctrs	Sites	Mbrs
CENTERS	In	6	15	54
	Out	7	-17	-98
SITES	In	5	8	-3
	Out	1	-1	-1
MEMBERS	In	11	0	57
	Out	-13	0	-32
No change		6	0	0
NET IMPACT		(1)	5	(23)

2005

42 Centers
96 Sites
643 Members

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2006 IUCRC System Changes

Industry/University Cooperative Research Centers

2005

42 Centers
96 Sites
643 Members

Note: Rows are mutually exclusive

Level of Change		Impacts		
		Ctrs	Sites	Mbrs
CENTERS	In	3	5	29
	Out	6	-12	-33
SITES	In	5	9	10
	Out	1	-1	2
MEMBERS	In	16	0	56
	Out	10	0	-46
No change		4	0	0
NET IMPACT		(3)	1	18

2006

39 Centers
97 Sites
661 Members

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2004-6 Update

Industry/University Cooperative Research Centers

- 2004-5: Program level <u>loss of 23 members</u>
  - New and graduating Centers: -44
  - Members with site changes : -4
  - Members at existing Centers: +25
- 2005-6: Program level <u>gain of 18 members</u>
  - New and graduating centers: -4
  - Members with site changes: +12
  - Members at existing Centers: +10

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Conclusion

Industry/University Cooperative Research Centers

- Changes in program-level membership over time can be very misleading
  - There's a lot of "membership churn" going on
- Net change in individual members =
  - Net change in membership from centers starting & stopping
  - Net change in membership from sites beginning and ending
  - Net change in individual members joining and leaving
- Need to look below the aggregate changes in order to understand what is really going on.

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Industry/University Cooperative Research Centers

PROCESS – OUTCOME DATA

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Process/Outcome 2005-2006 Response Rates

Industry/University Cooperative Research Centers

	Center level		Individual level	
Response frequencies	Industry	Faculty	Industry	Faculty
Population from CD report	34	34	621	496
Retired/Defunct Centers	1	1	16	32
Retired/Defunct Centers Reporting	0	0	0	0
New Centers Reporting	+1	+1	+5	0
Population	34	34	610	464
Centers Excused from Evaluation	2	4	46	32
Centers that did not return data	1	1	12	8
Available Population	31	29	552	424
Data Received	31	29	266	192
Response Rates				
Received / Population	91.2%	85.3%	42.8%	38.7%
Received / Available Population	100%	100%	48.2%	45.3%

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Questionnaire Changes 2006-7

Industry/University Cooperative Research Centers

- Industry Questionnaire
  - Shortened (44/27 to 16); One length questionnaire
    - » Some questions dropped
  - Q5: “follow-on funding” now asked with forced choice options
- Faculty Questionnaire
  - Shortened (from 29); Long (13) and Short (6) Questionnaire
  - Wording of some items changed so not comparable to previous questionnaires

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Industry/University Cooperative Research Centers

Industry Questionnaire

Select Results

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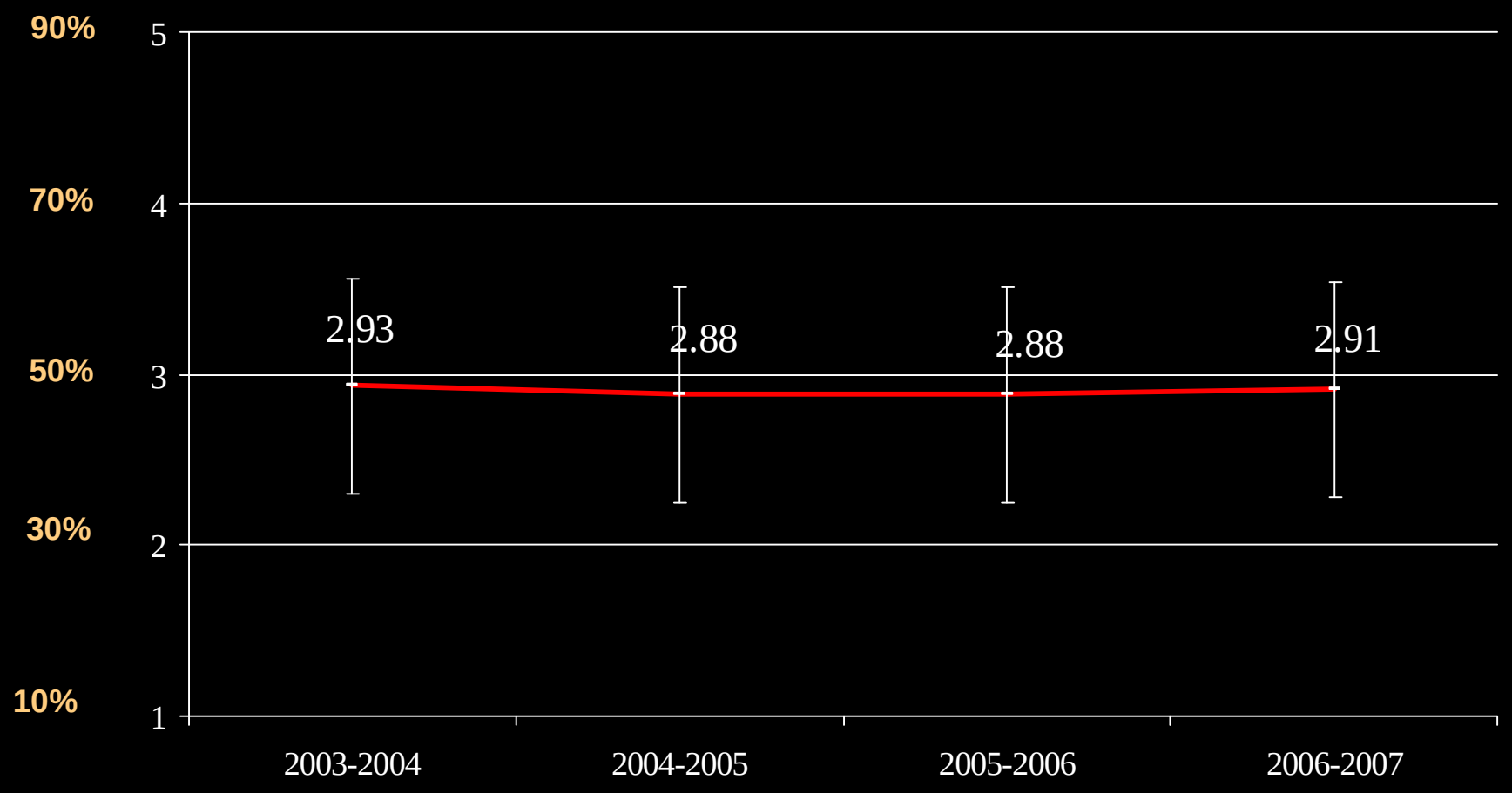
What percentage of Center research projects do you take an active interest in?

Industry/University Cooperative Research Centers



***percentage values on y-axis represent midpoint of response range**

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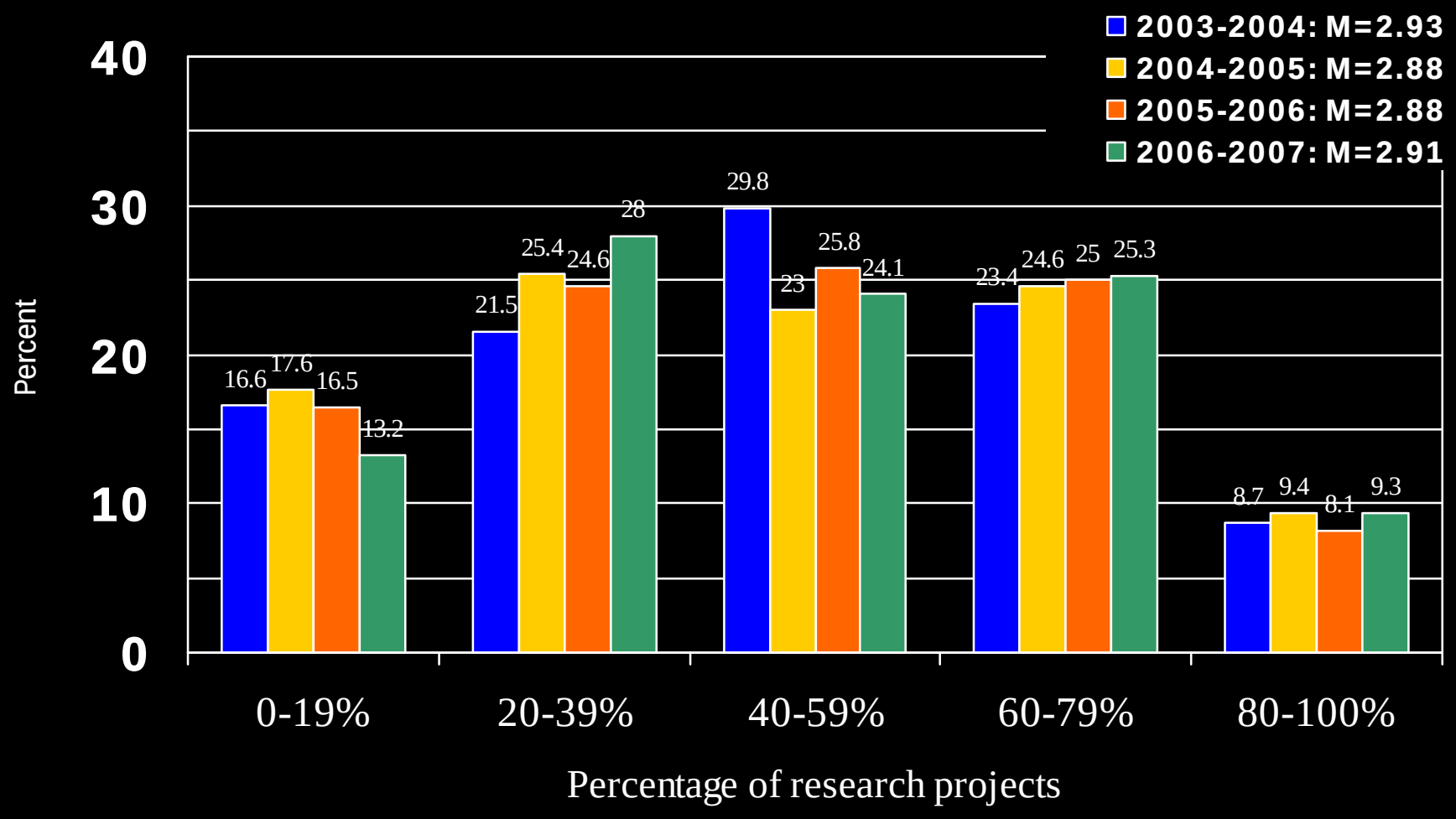
Industry/University Cooperative Research Centers



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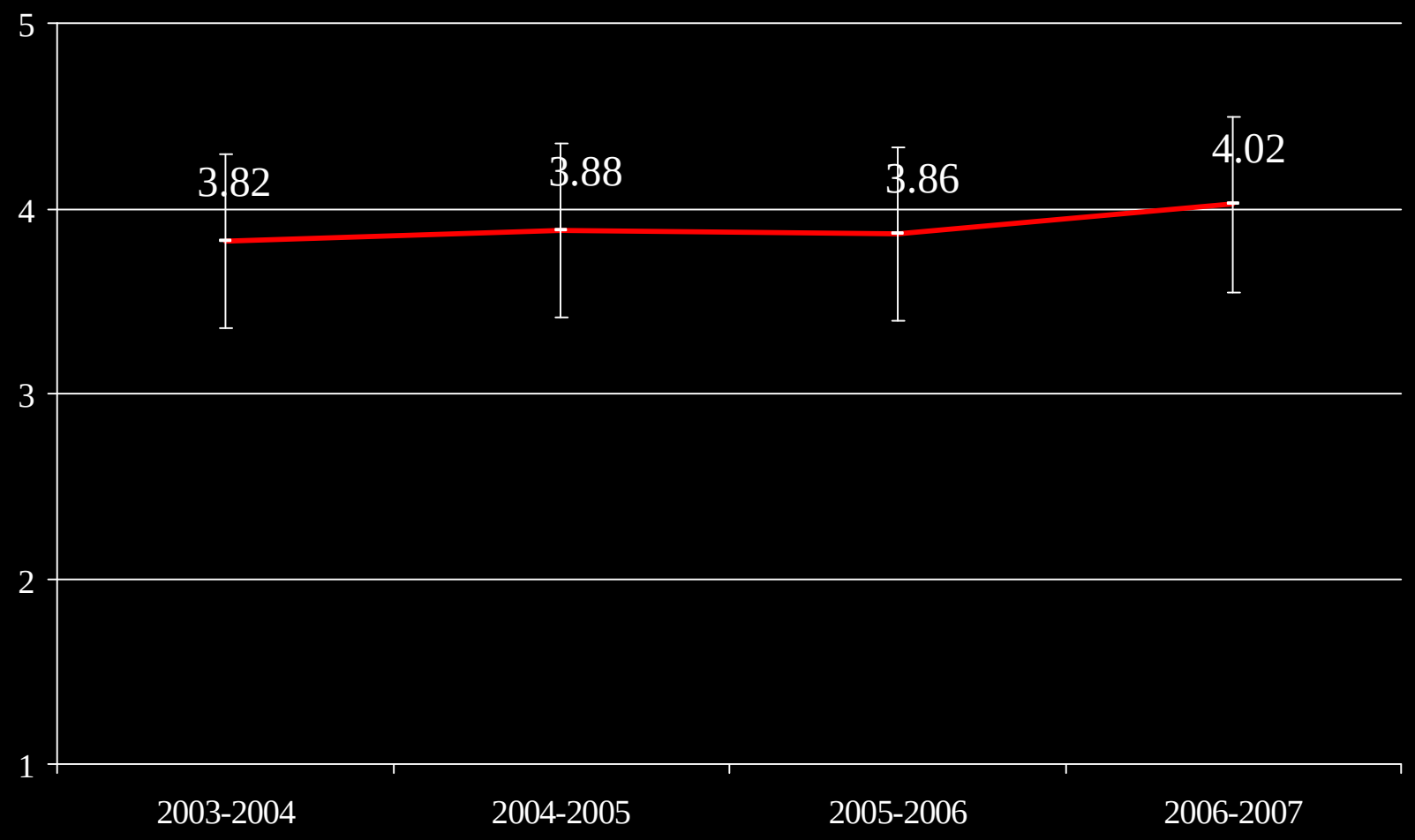
During the past year, how satisfied were you with the Center's breadth of research topics covered?

Industry/University Cooperative Research Centers



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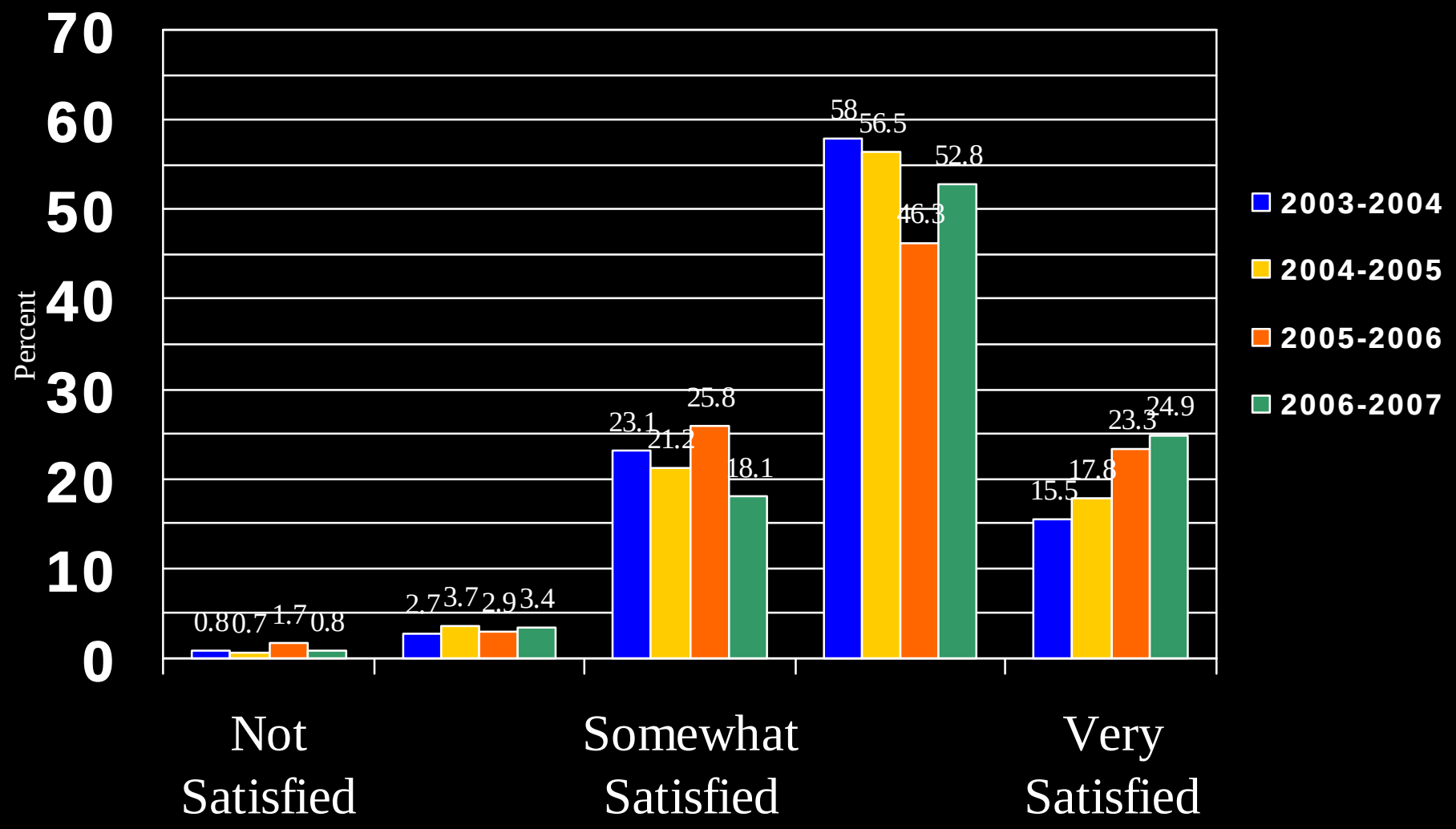

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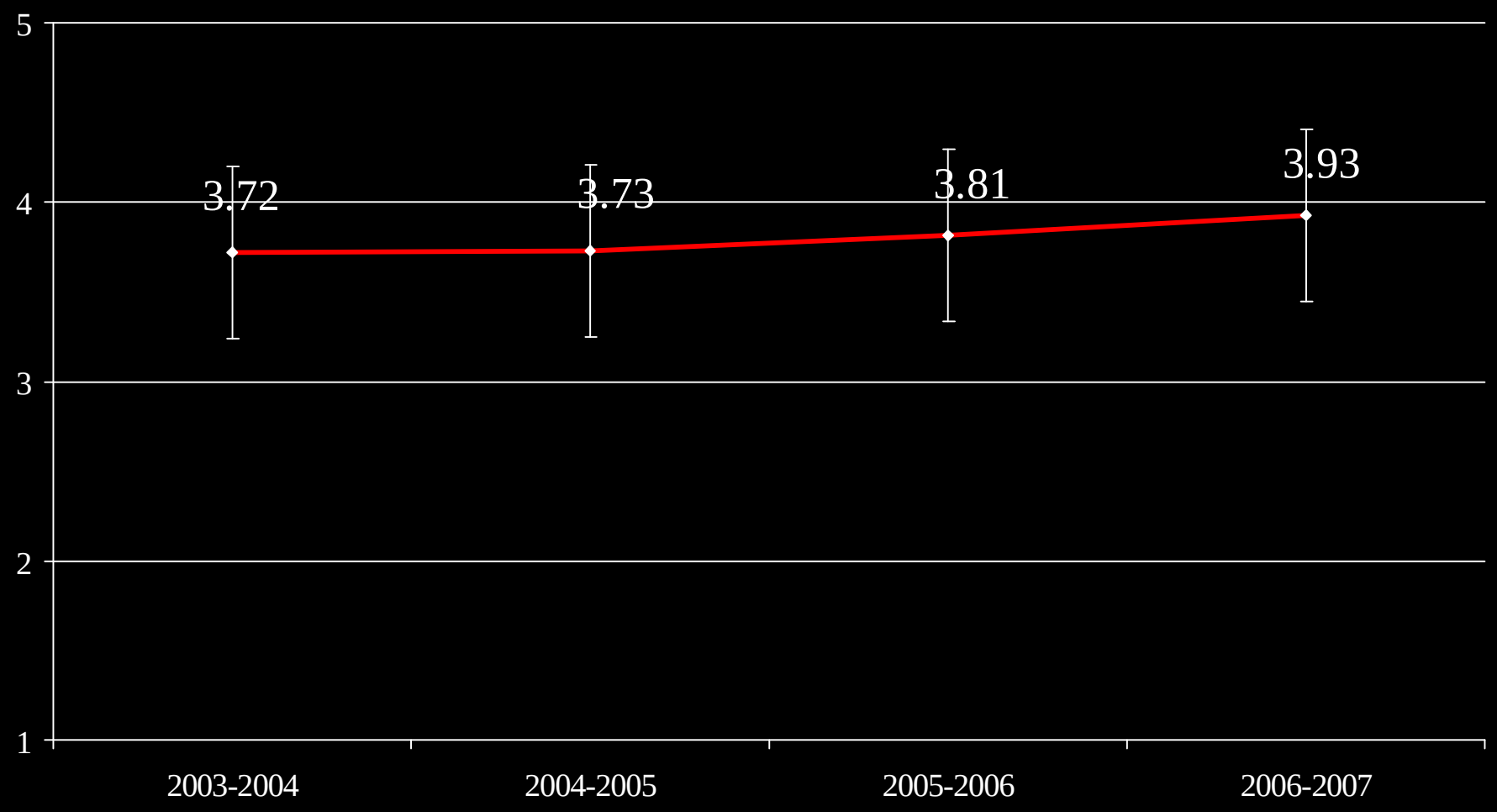
During the past year, how satisfied were you with the Center's focus of the research?

Industry/University Cooperative Research Centers



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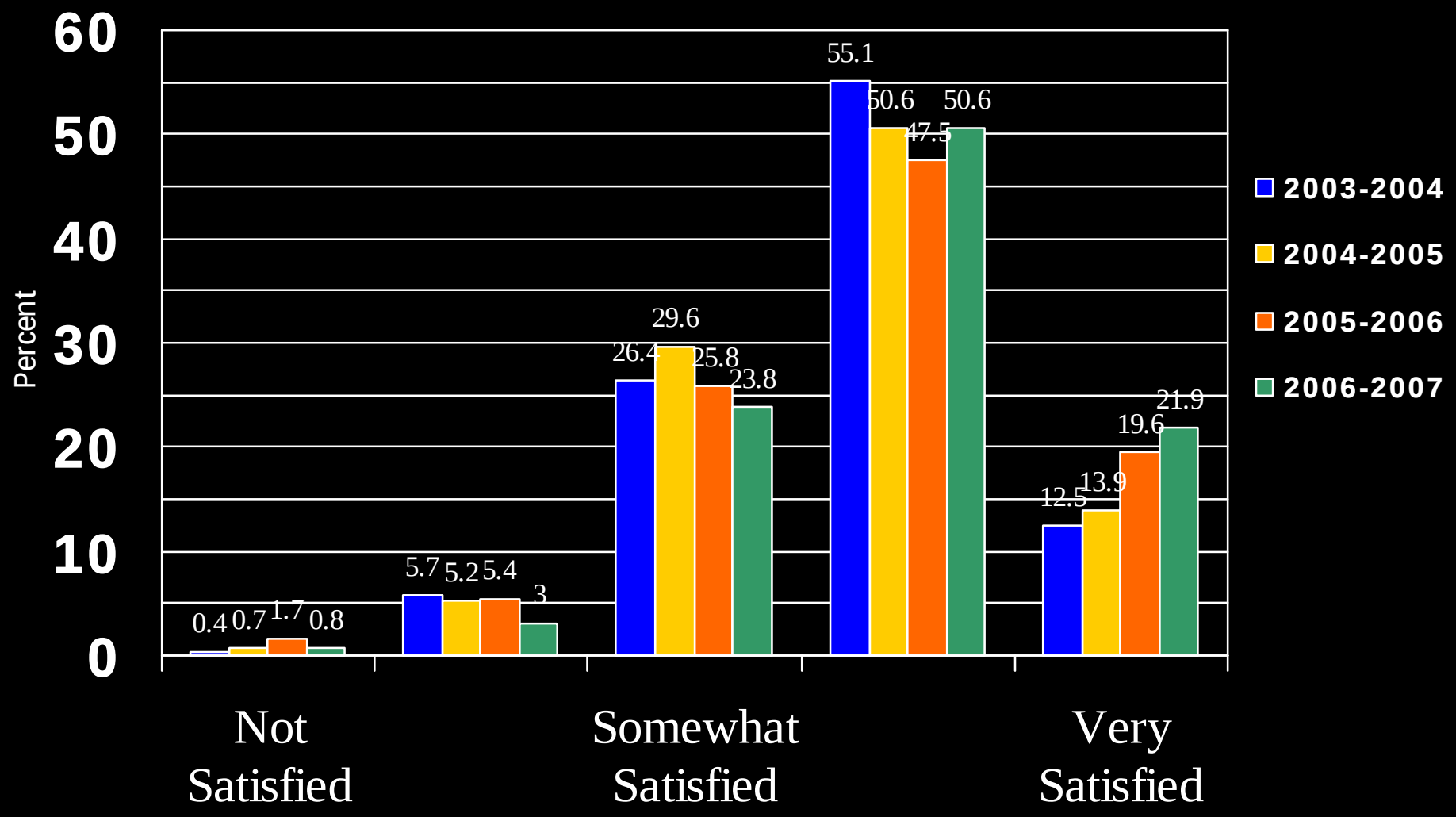

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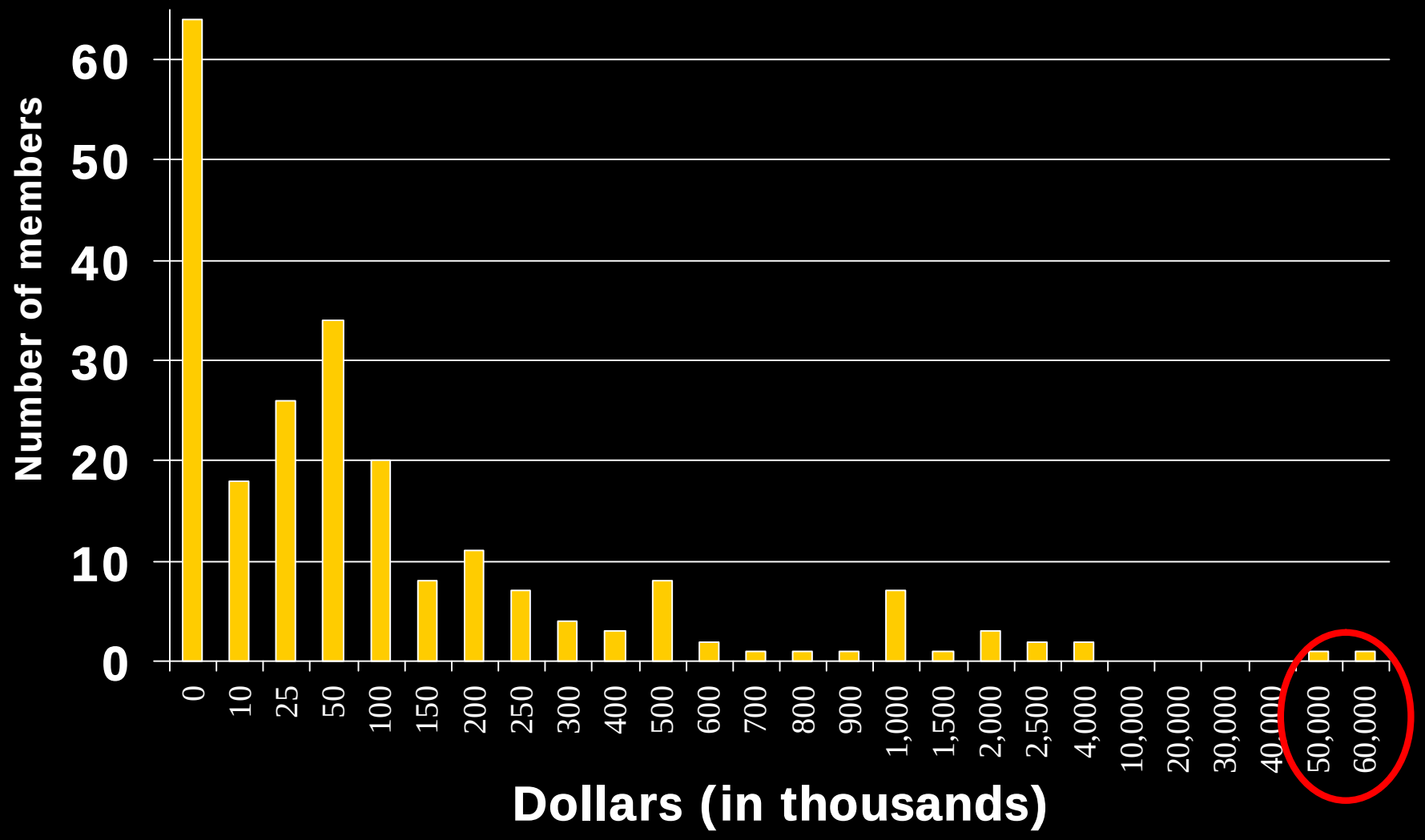
Value of Center-Stimulated Projects: FY 2006-2007

Industry/University Cooperative Research Centers



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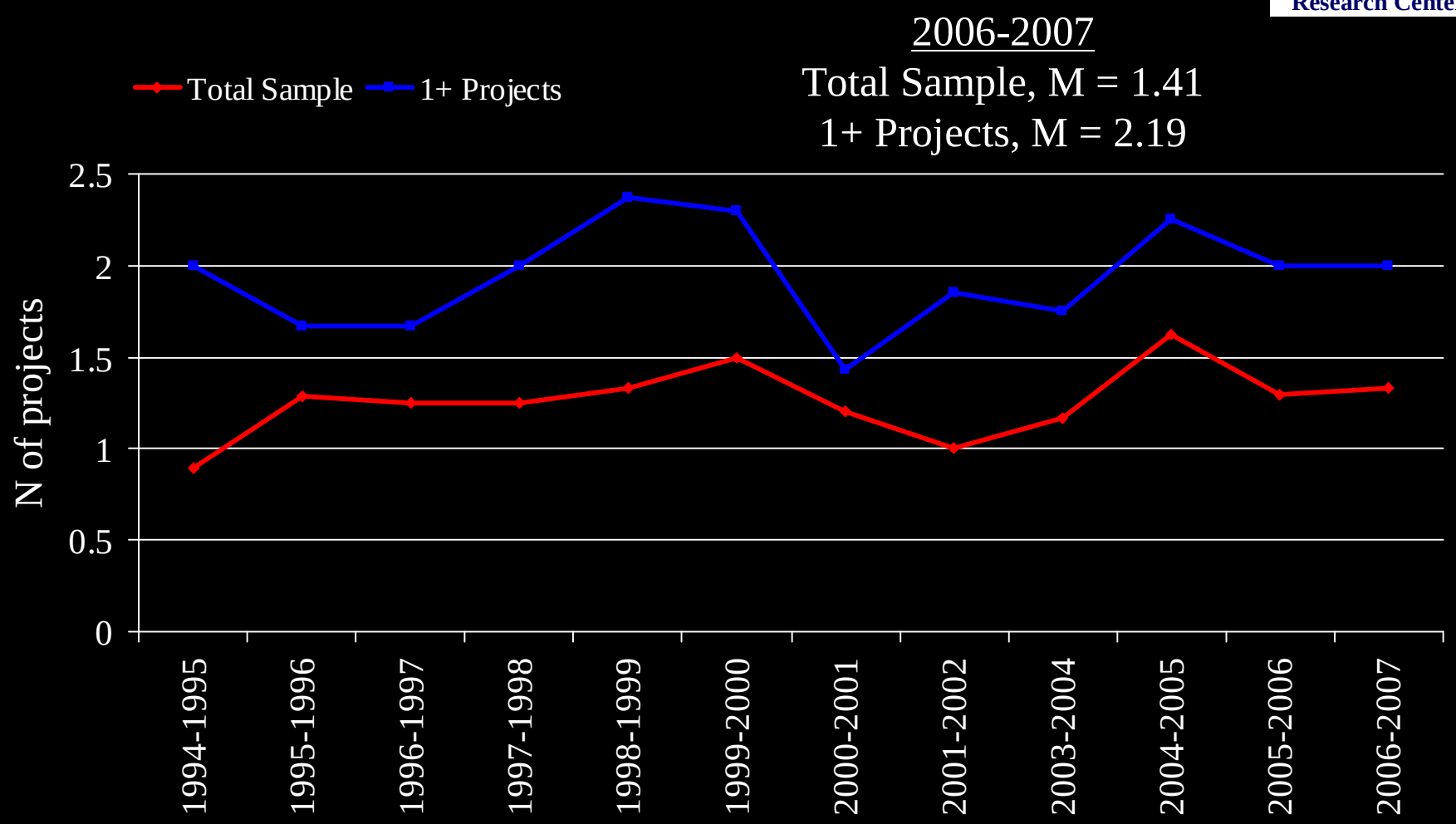
13 Year Trend – New Research Projects (reported median)

Industry/University Cooperative Research Centers



Note: 2002-2003 data not included

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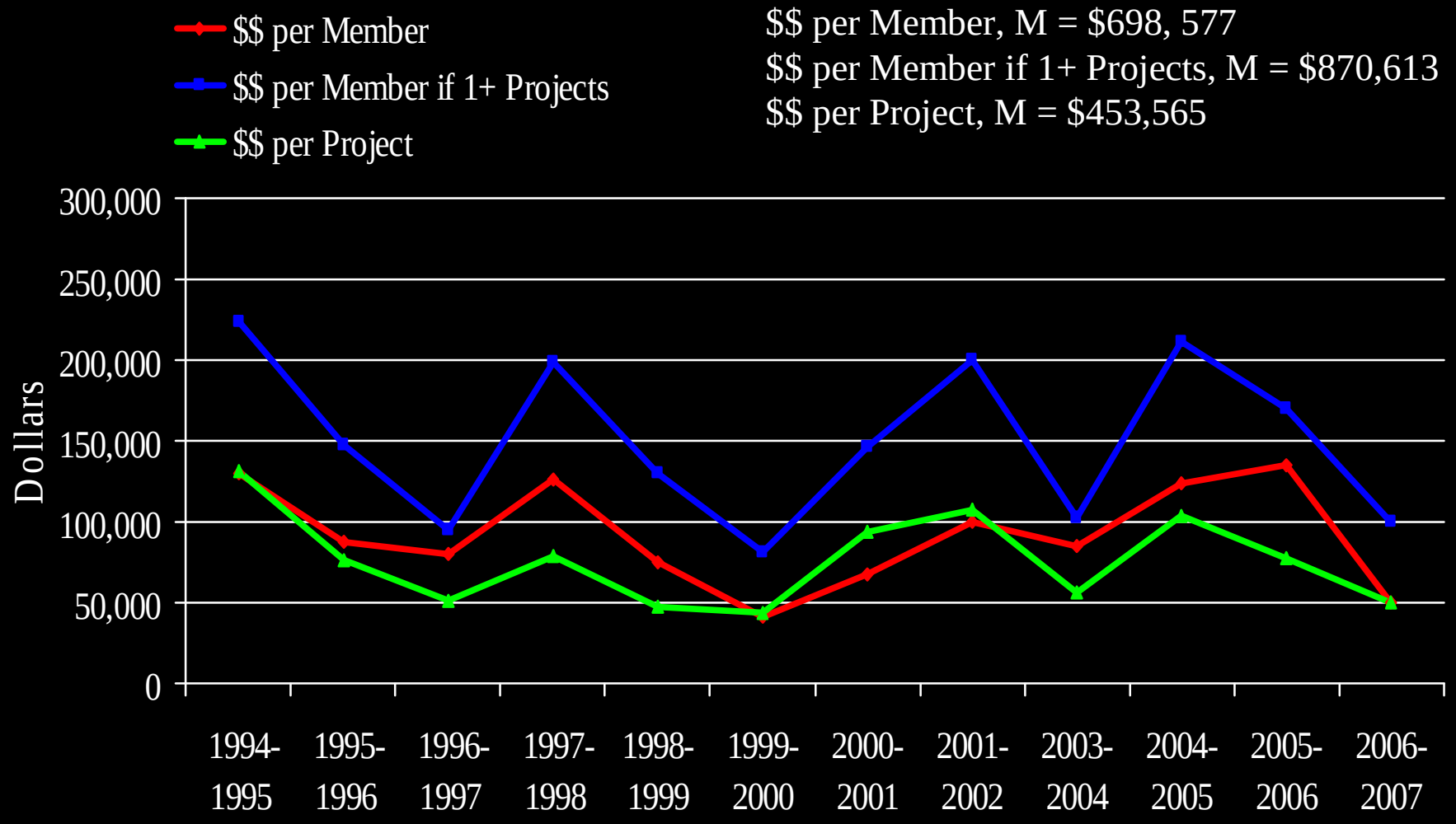
13 Year Trend - Total Dollar Value of Projects (reported median)

Industry/University Cooperative Research Centers

2006-2007
$$ per Member, M = $698, 577
$$ per Member if 1+ Projects, M = $870,613
$$ per Project, M = $453,565



Note: 2002-2003 data not included

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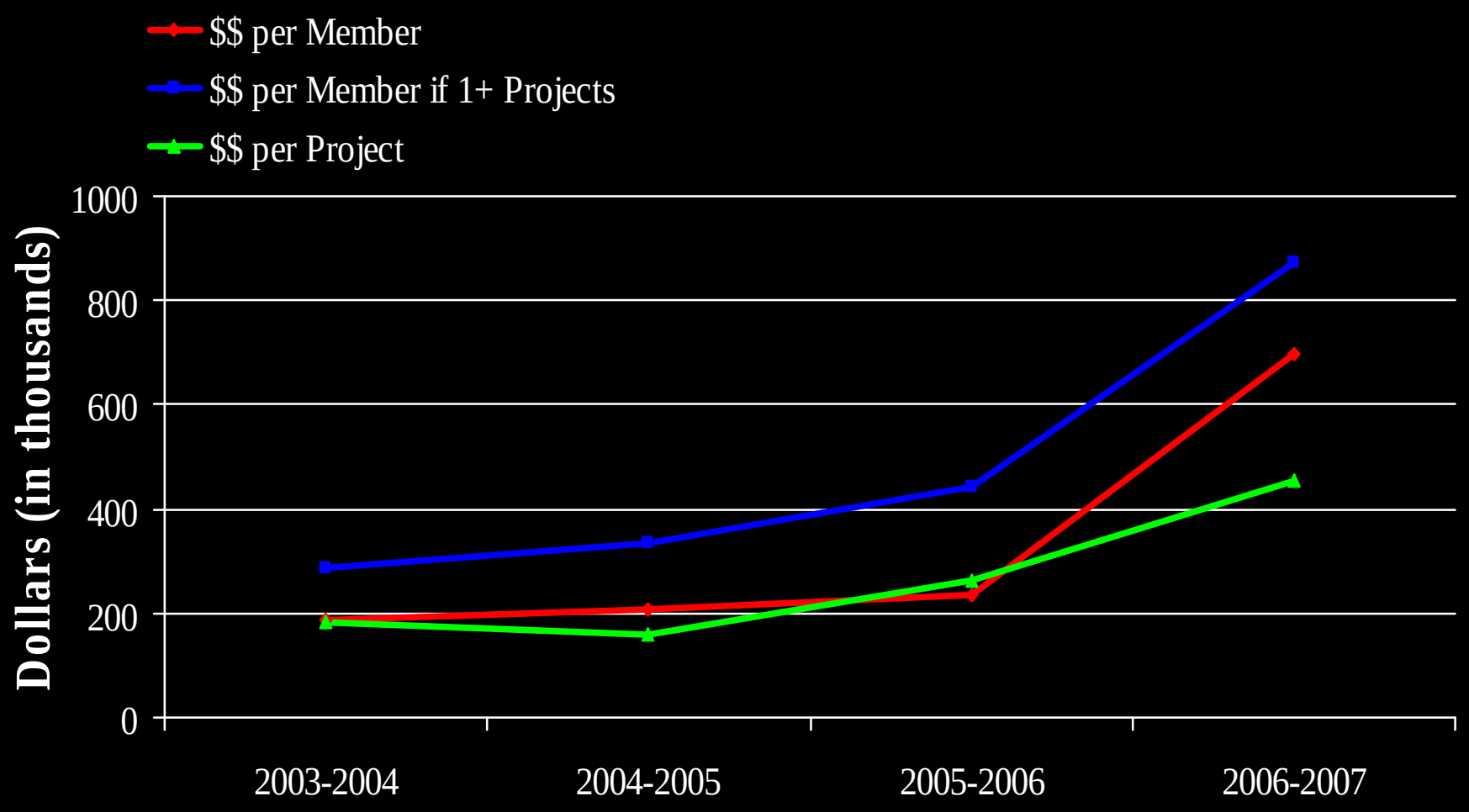
4 Year Trend - Total Dollar Value of Projects (reported mean)

Industry/University Cooperative Research Centers



Note: Data collected by forced choice format beginning 2006-7

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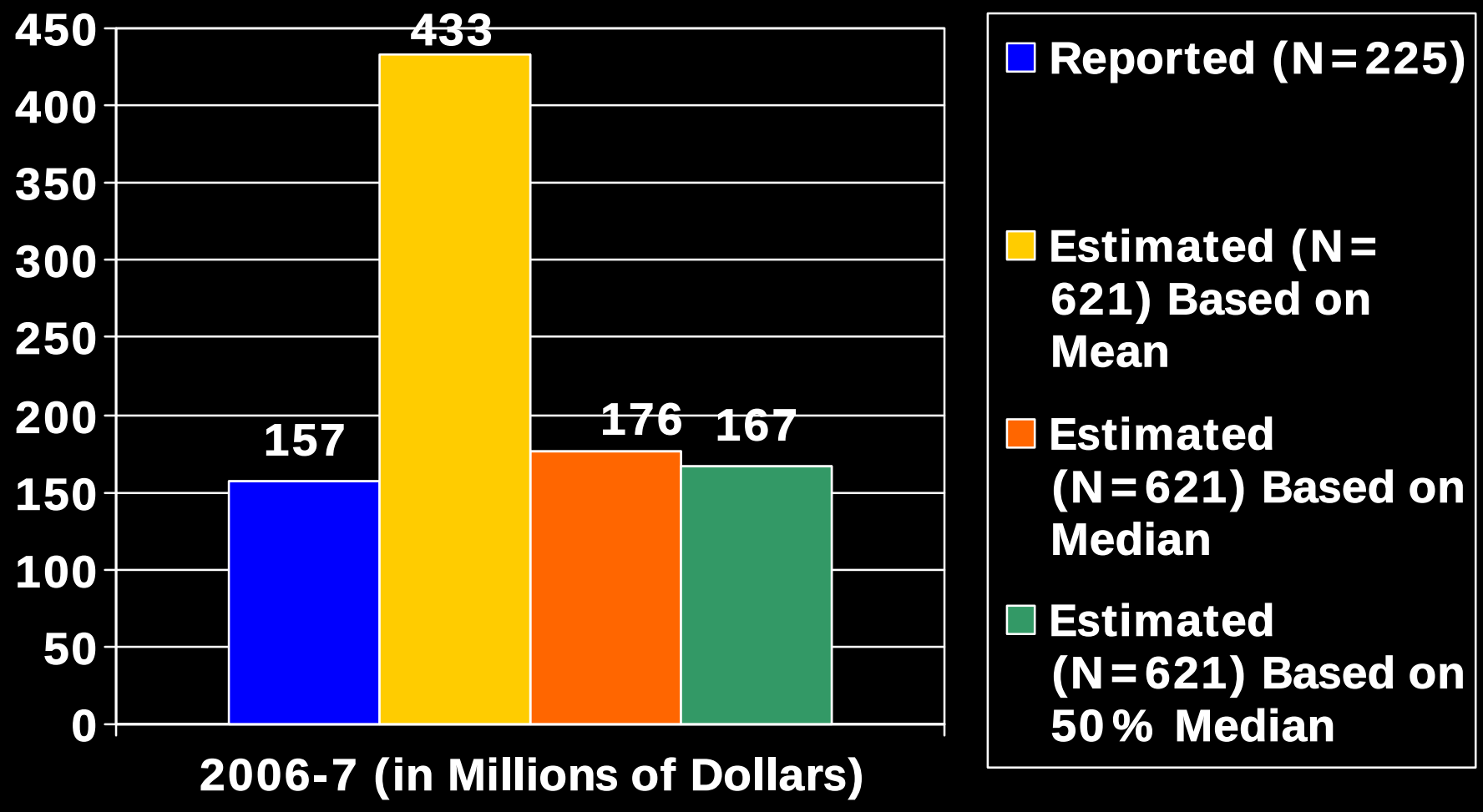
Estimating IUCRC-Wide Follow-on Funding

Industry/University Cooperative Research Centers



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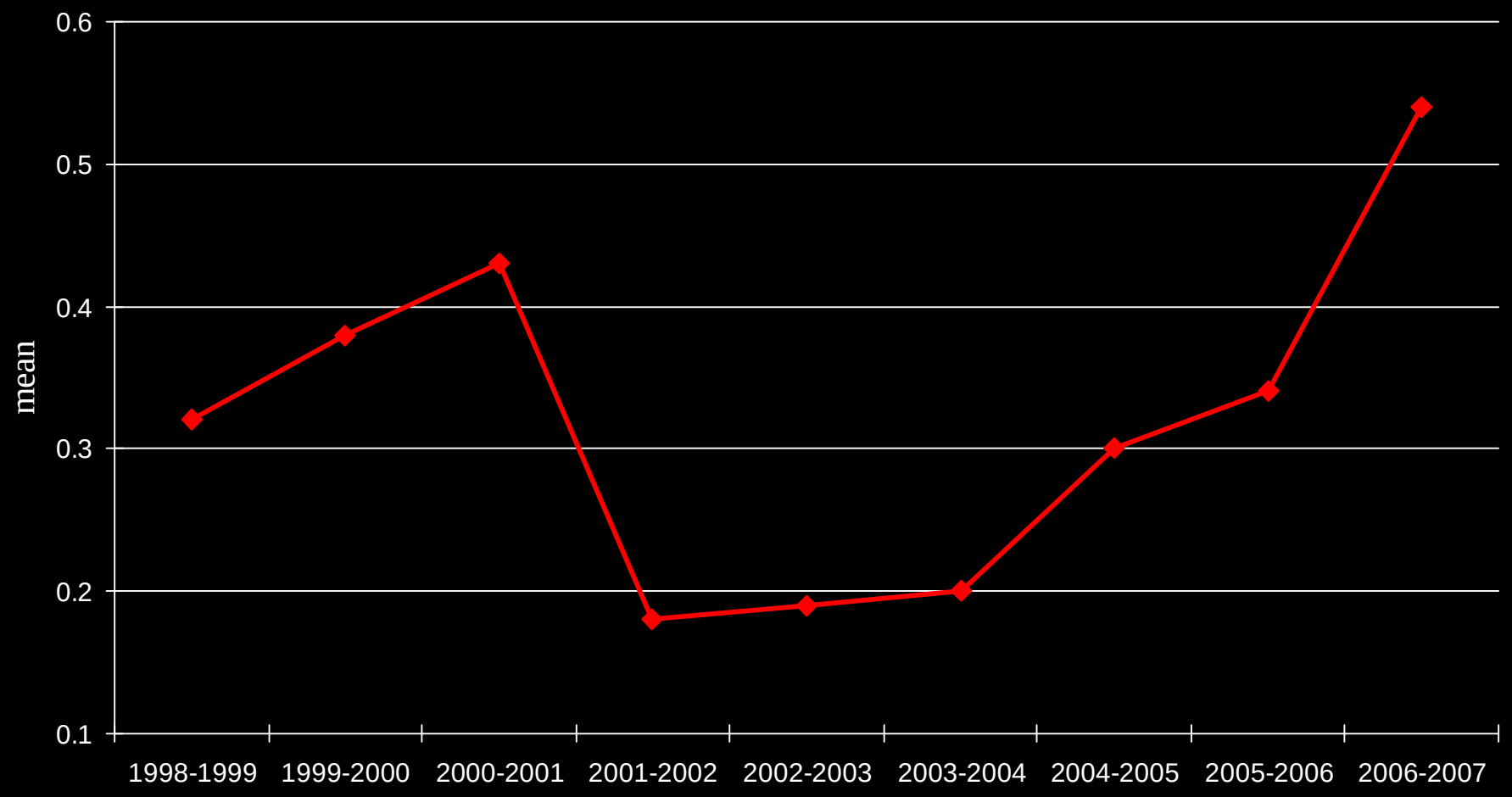
During the past year, how many students trained in the Center projects were hired by your organization?

Industry/University Cooperative Research Centers



Note: 2002-2003 data based on subset of Centers

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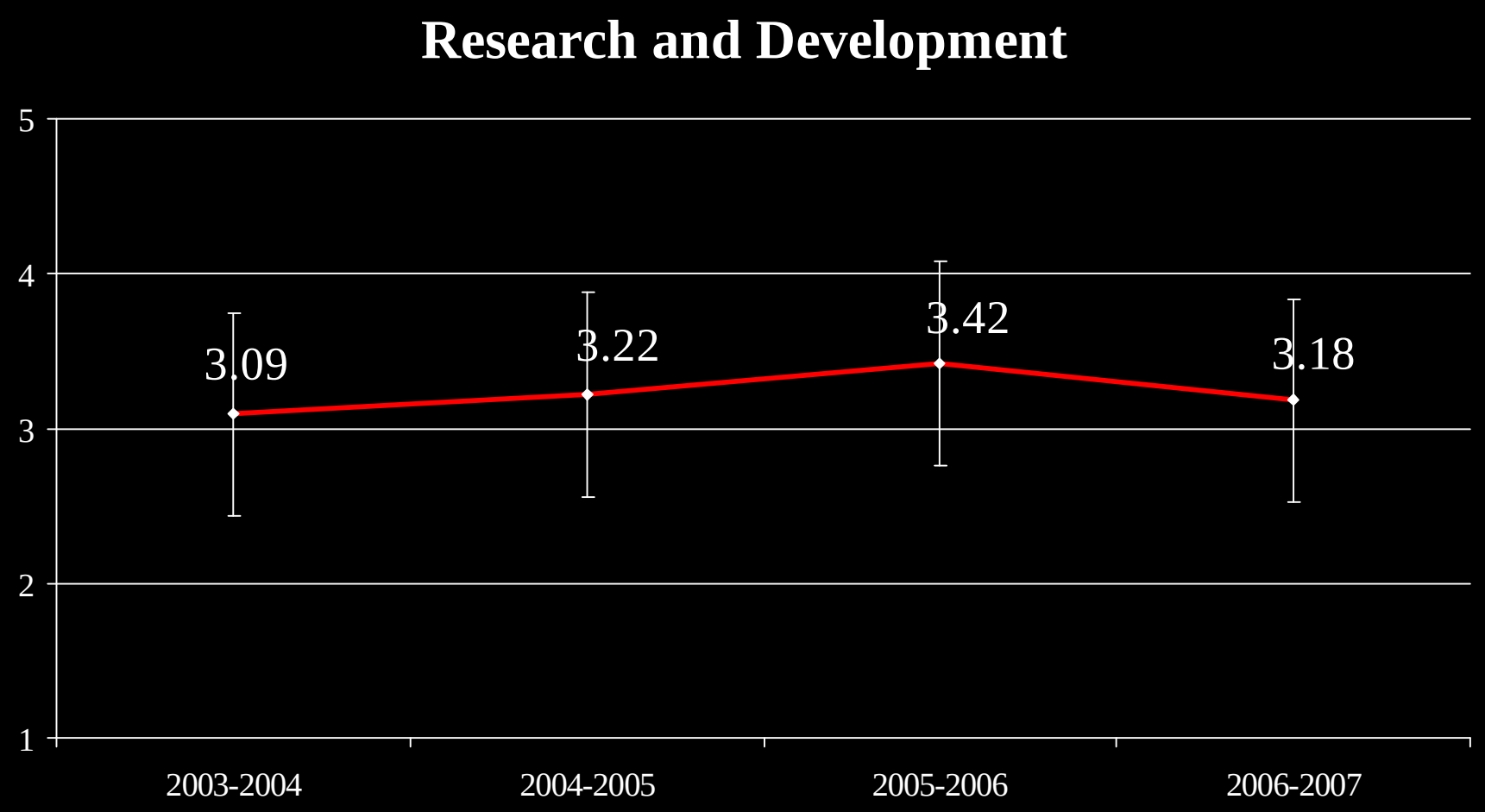
During the past year, to what extent has participation in the Center contributed to the following benefits for your organization?

Industry/University Cooperative Research Centers



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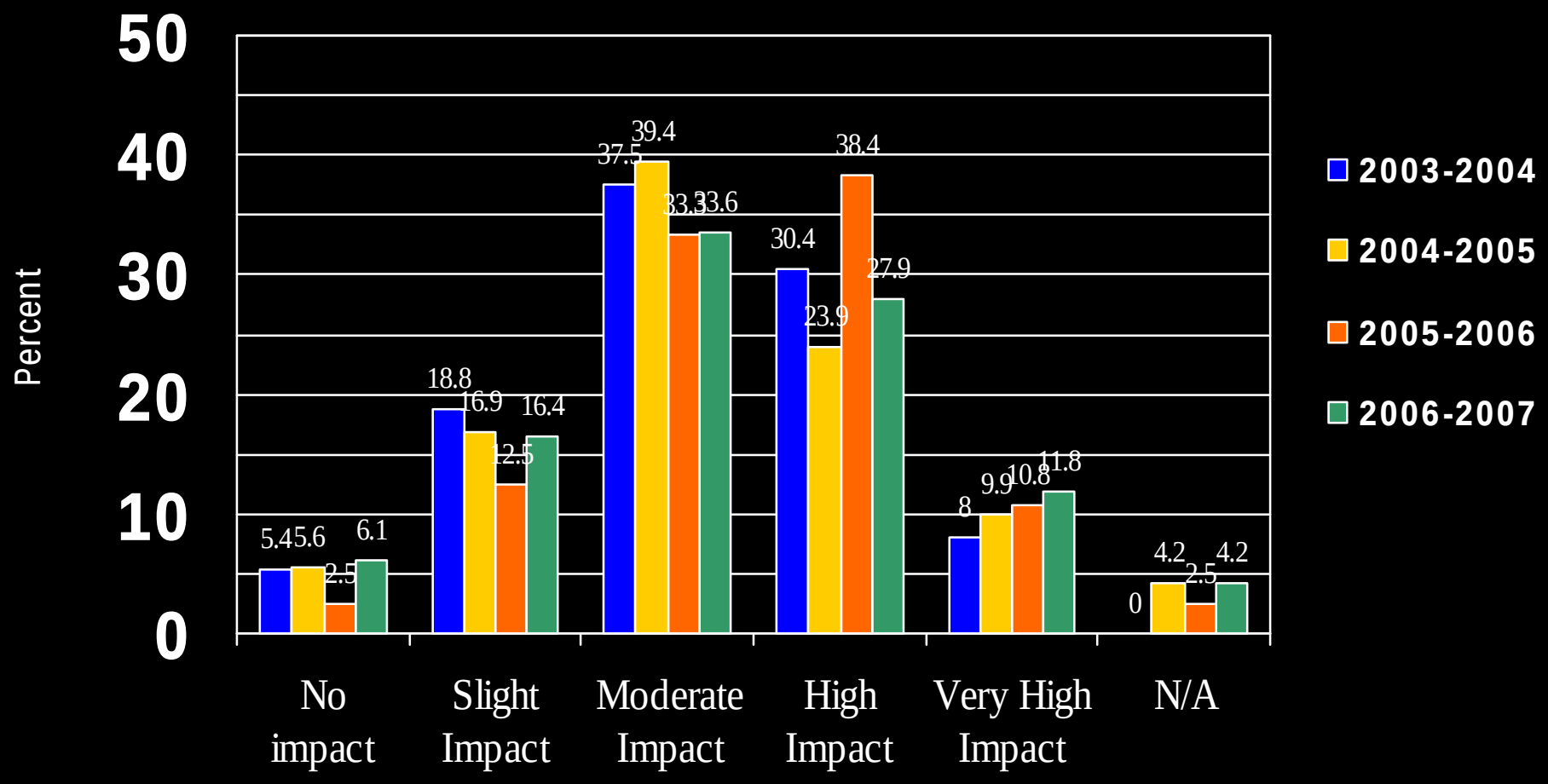
During the past year, to what extent has participation in the Center contributed to the following benefits for your organization?

Industry/University Cooperative Research Centers

Research and Development



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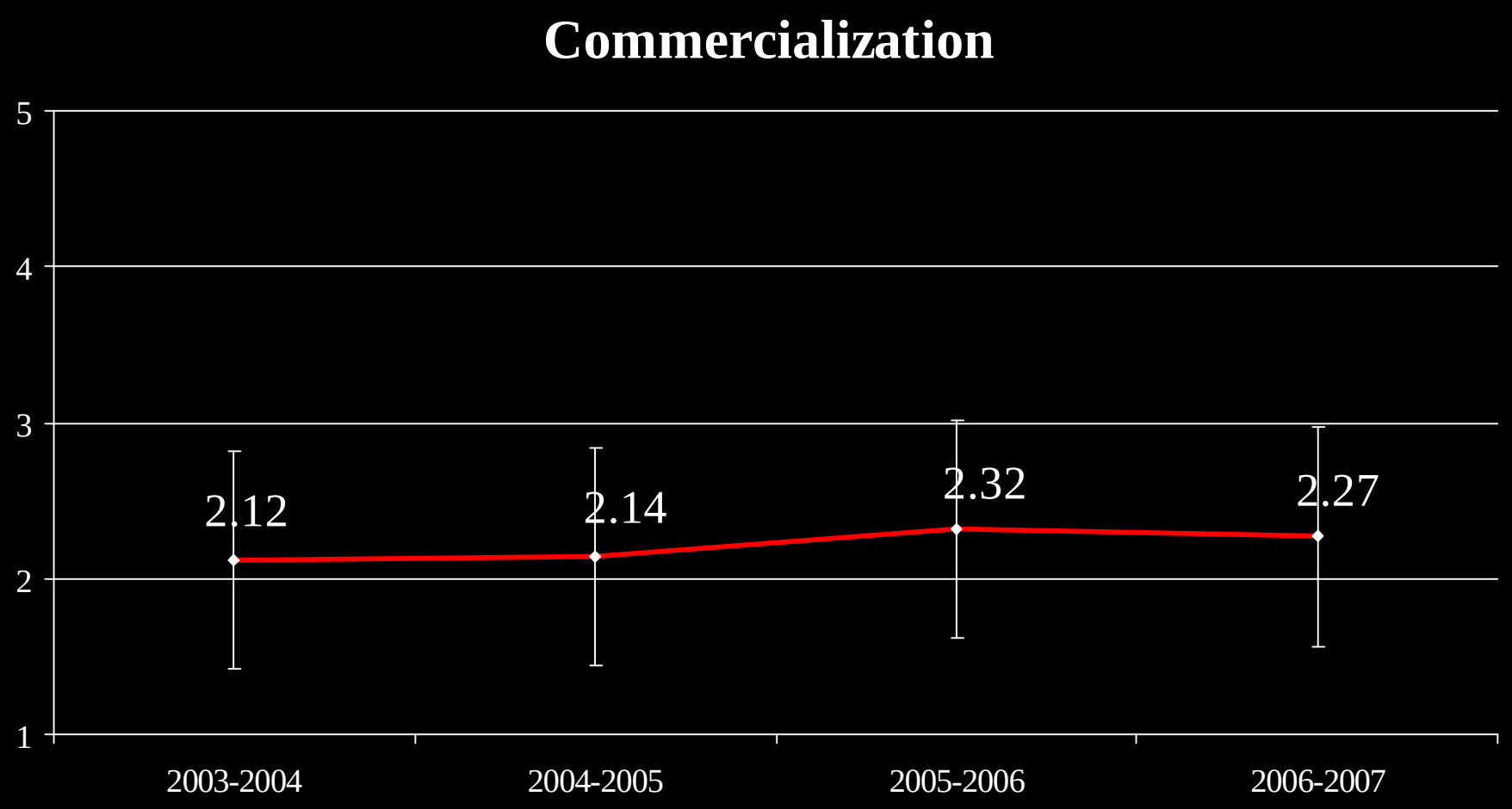
Industry/University Cooperative Research Centers



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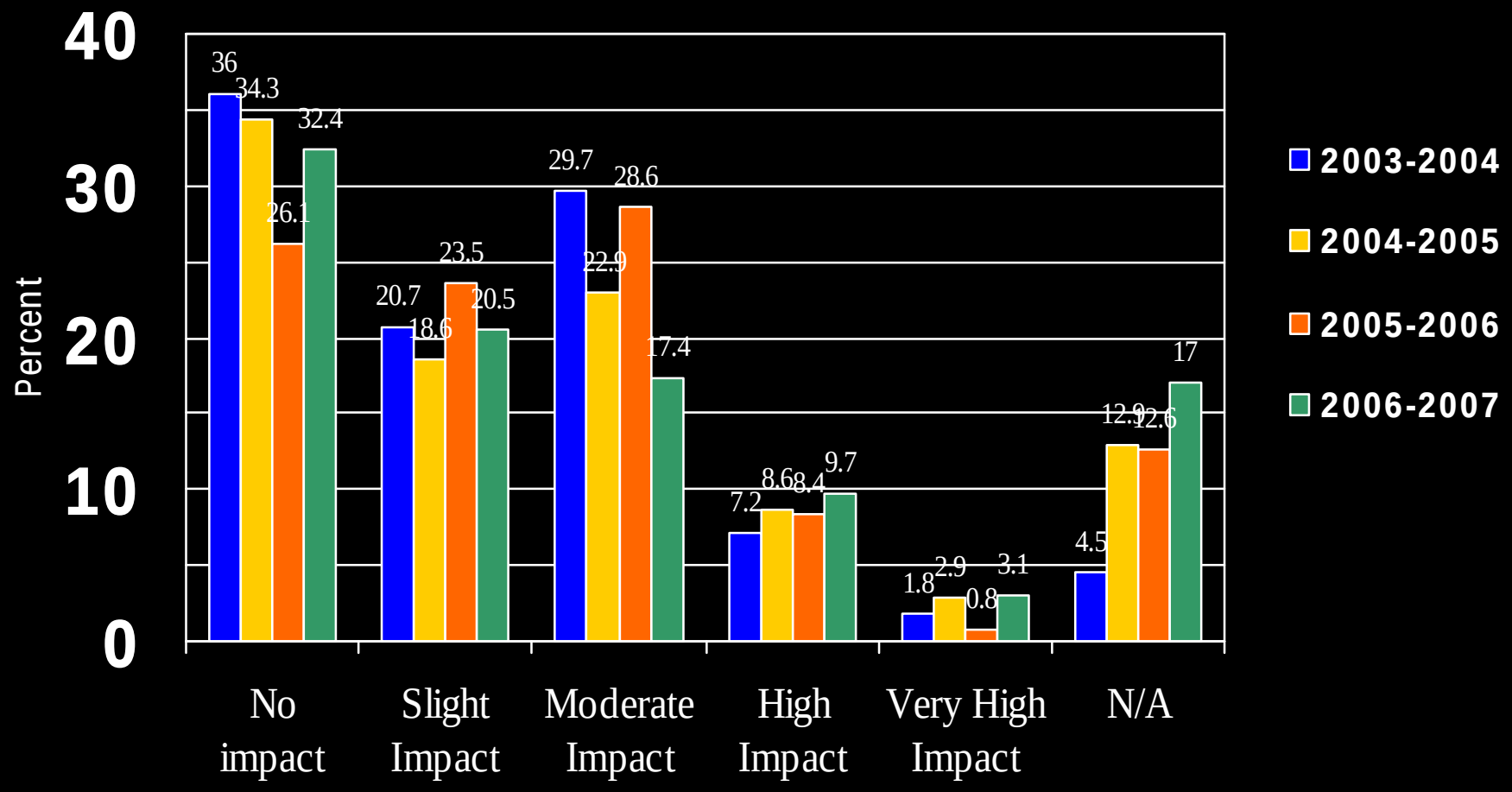
During the past year, to what extent has participation in the Center contributed to the following benefits for your organization?

Industry/University Cooperative Research Centers

Commercialization



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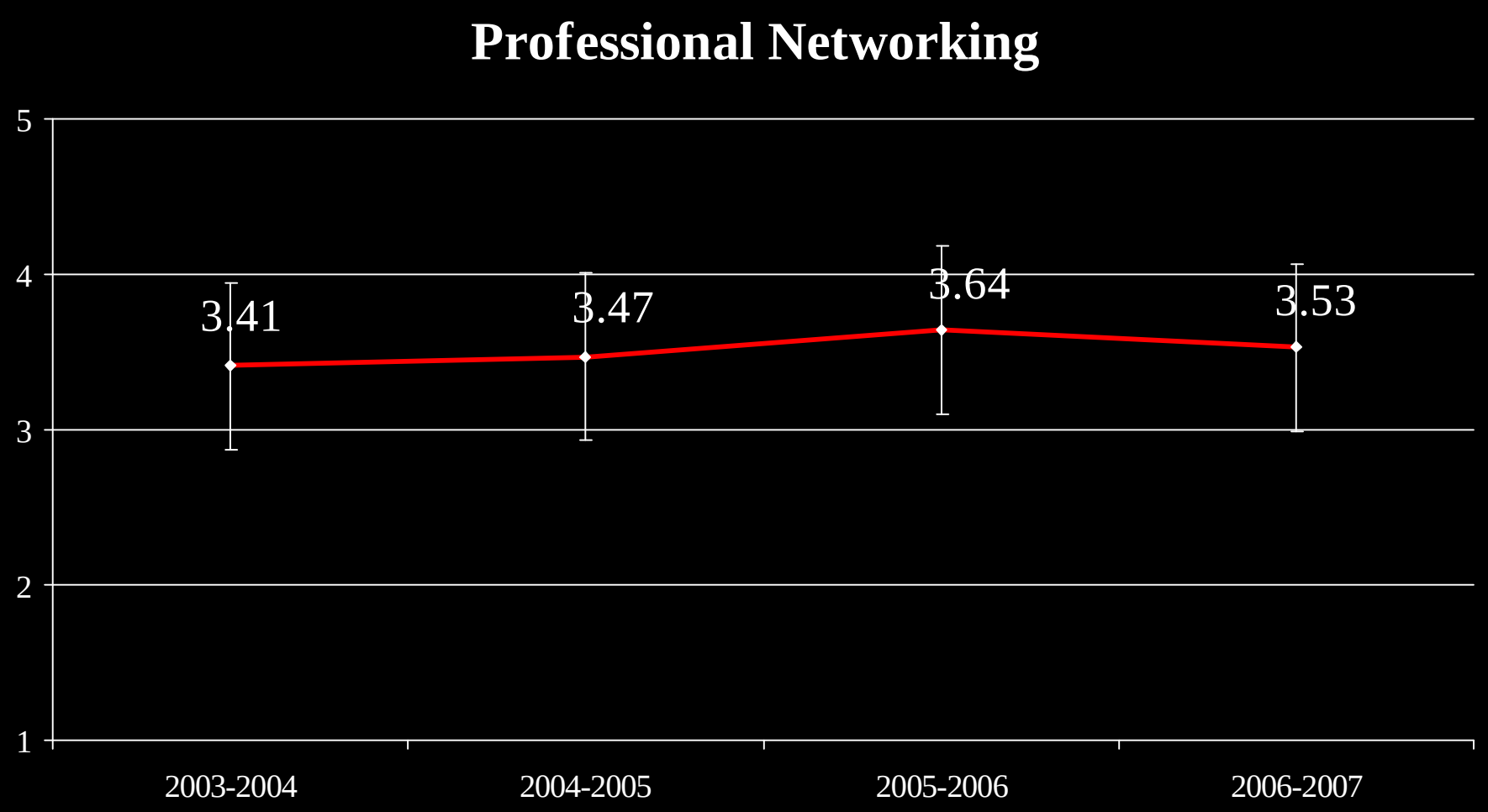
Industry/University Cooperative Research Centers



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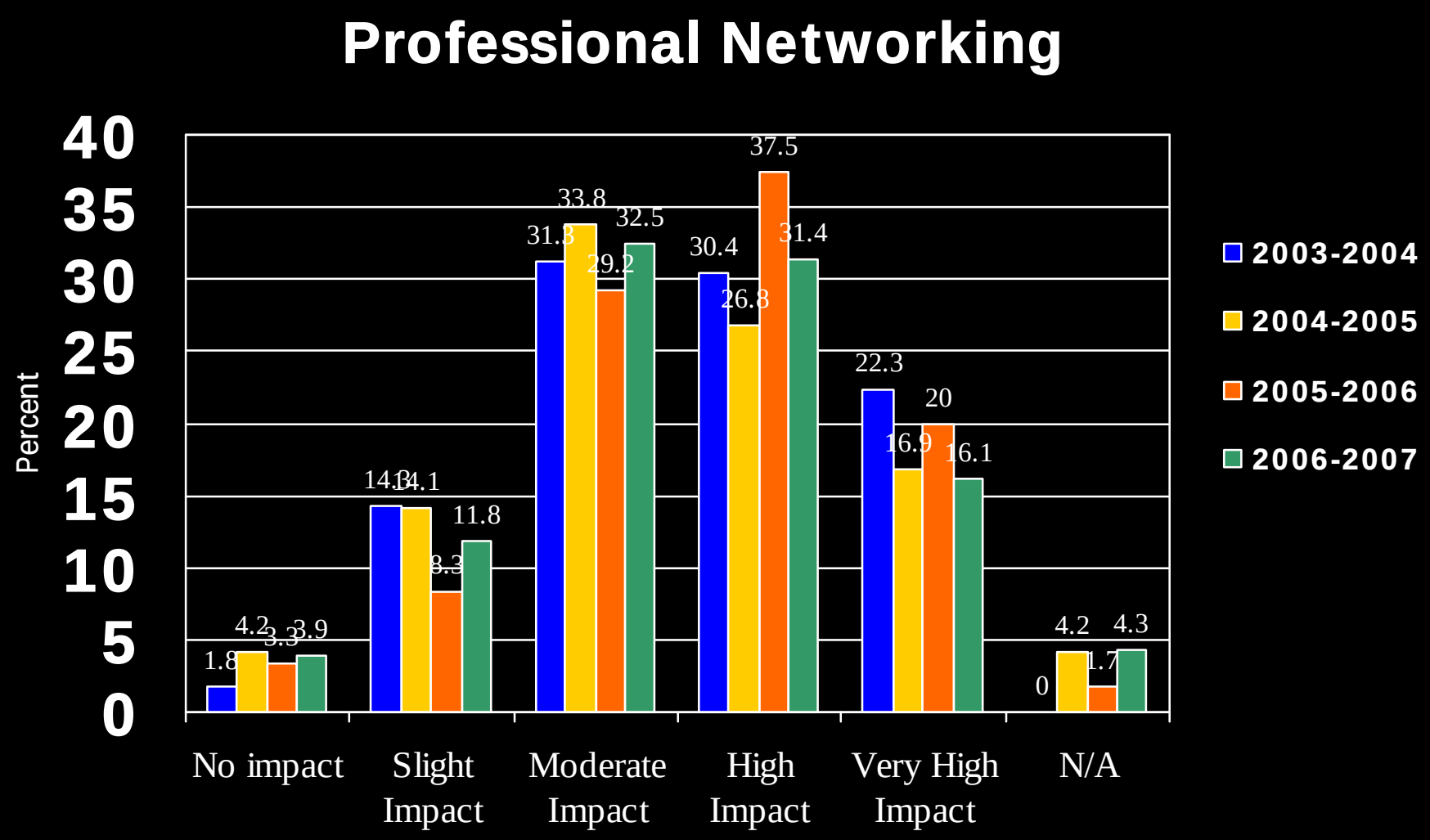
Industry/University Cooperative Research Centers



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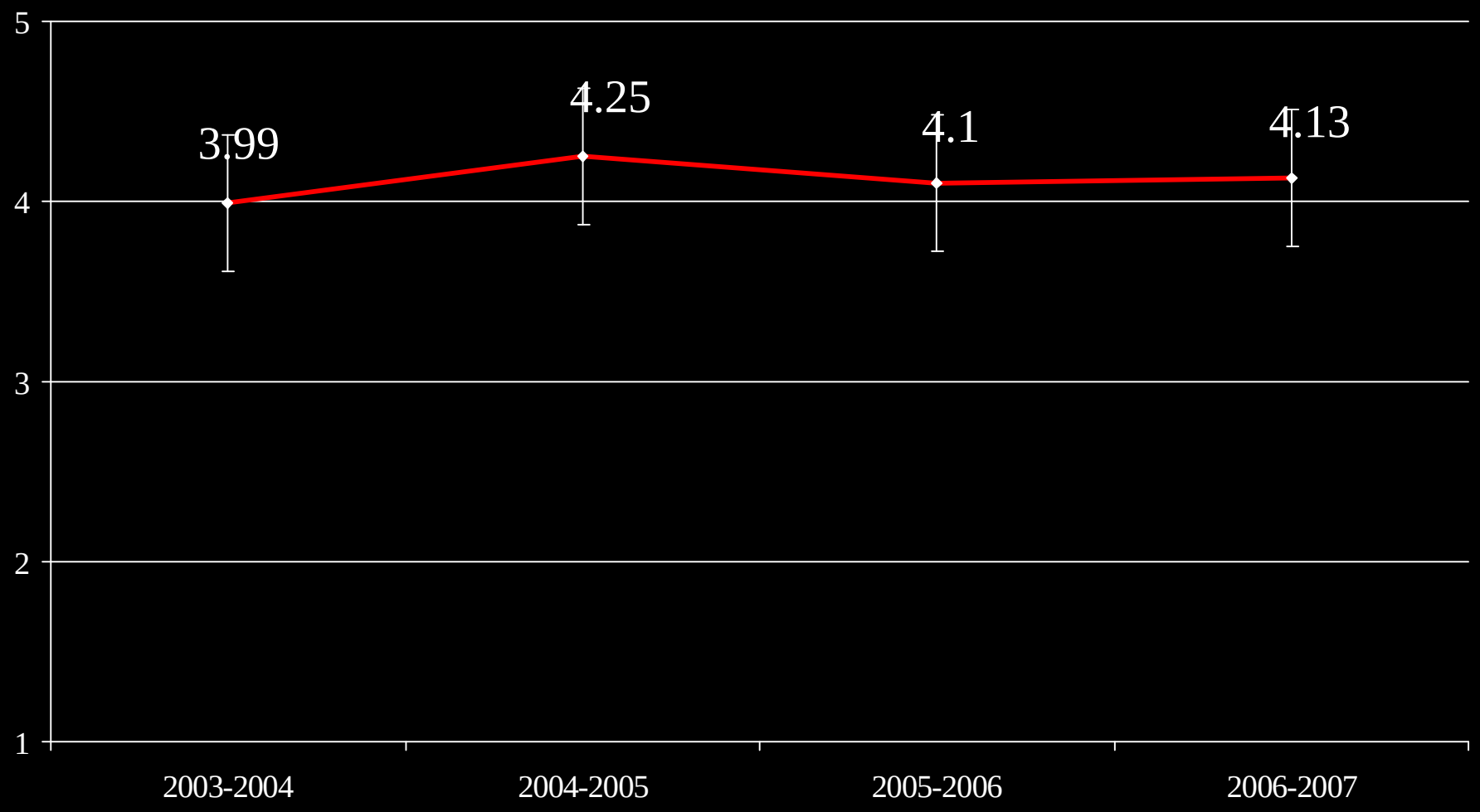
During the past year, how satisfied were you with center administrative operations?

Industry/University Cooperative Research Centers



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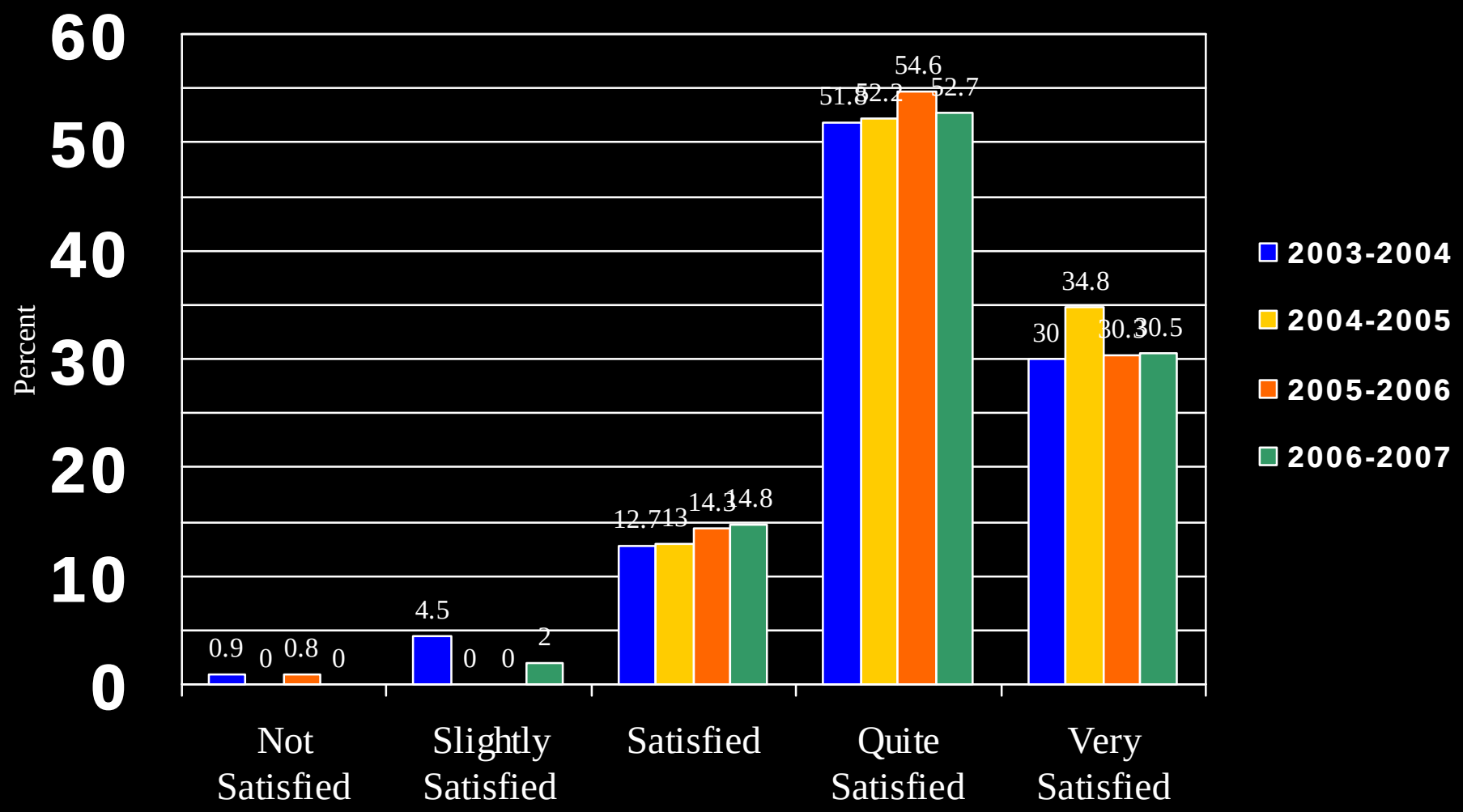

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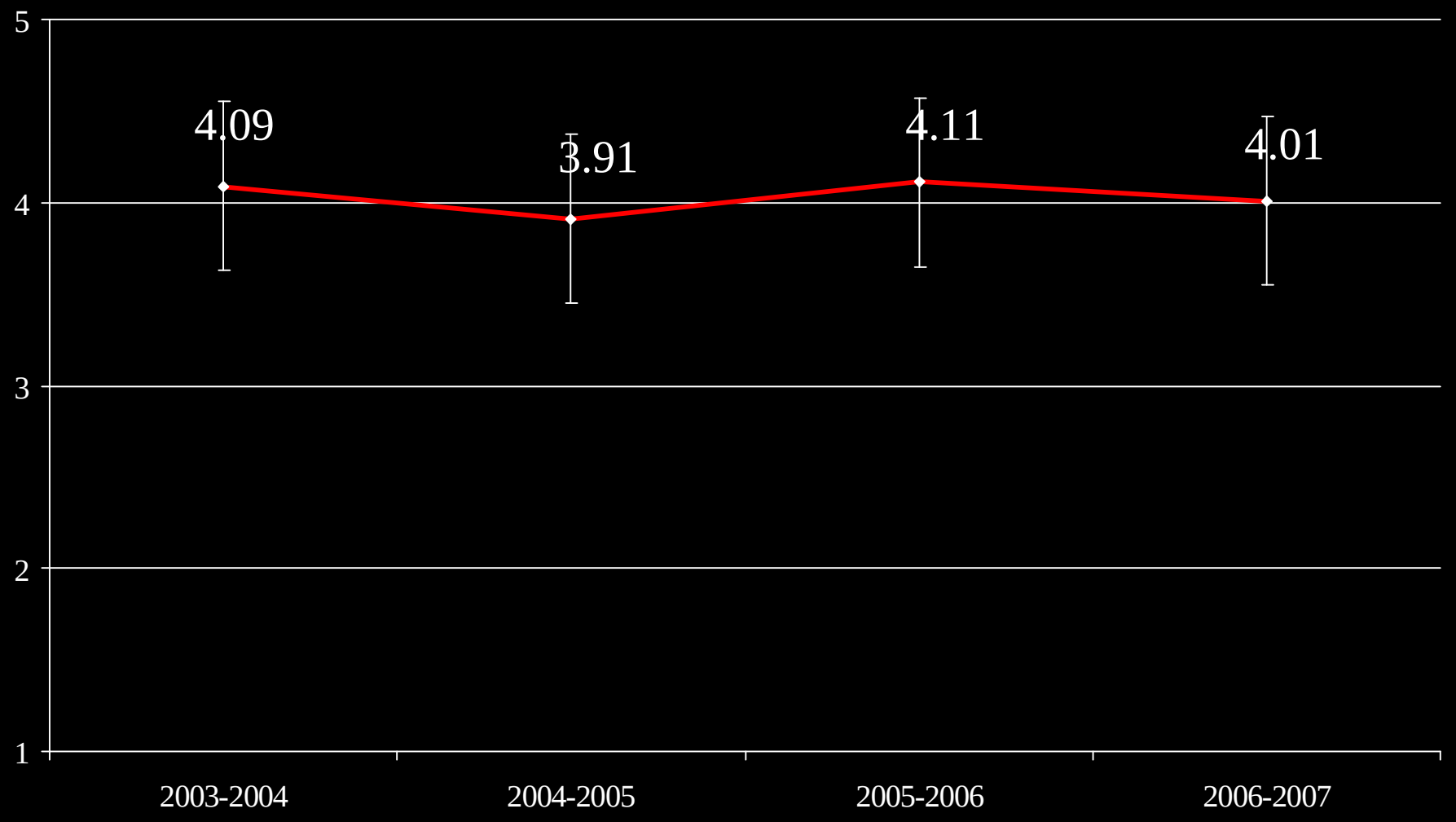
Will your organization renew its membership?

Industry/University Cooperative Research Centers



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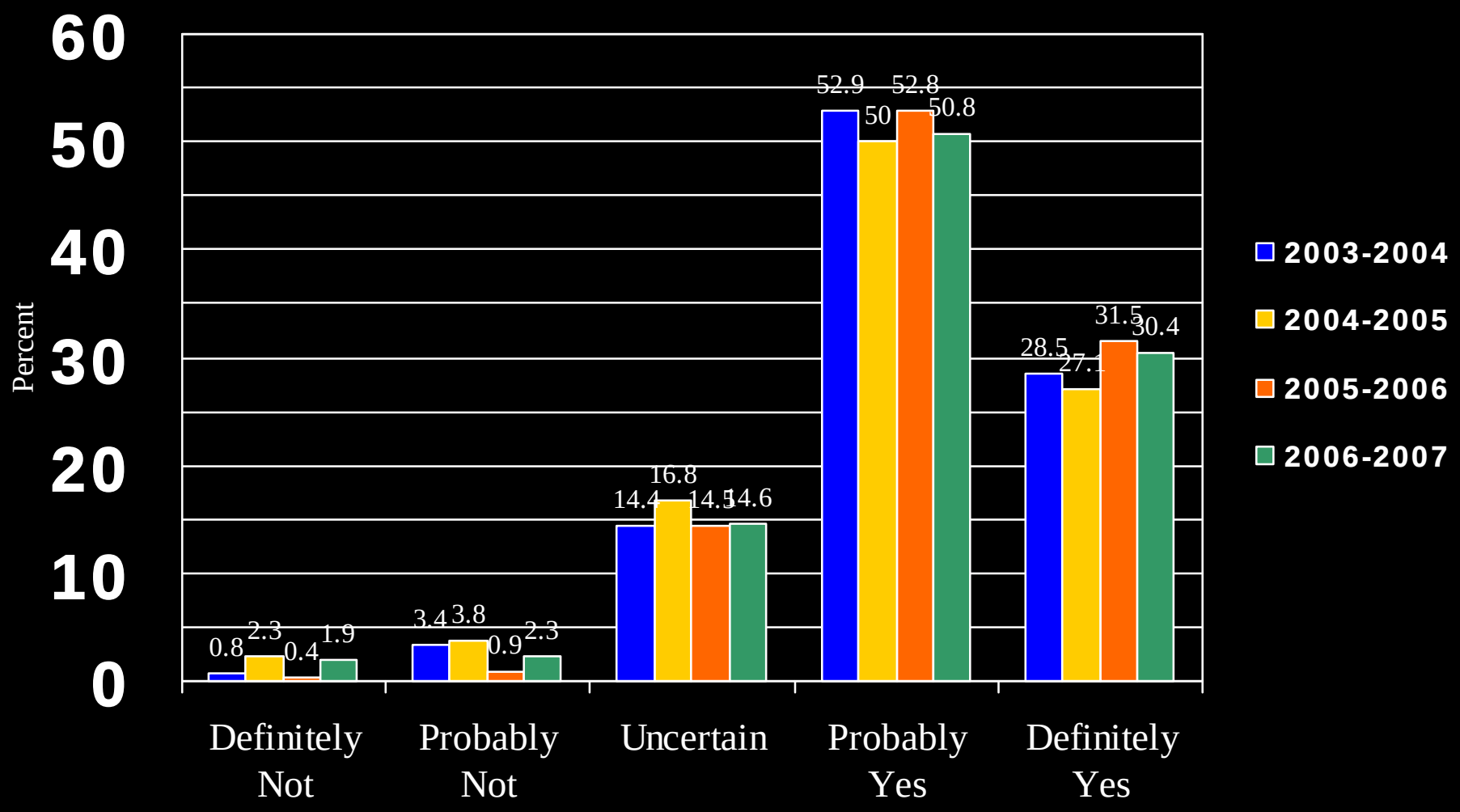

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Industry/University Cooperative Research Centers

Faculty Questionnaire

Select Results

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Faculty Long and Short Forms

Industry/University Cooperative Research Centers

	Long Form	Short Form
# of items	13	6
# of questions in common	6	6
# of unique questions	7	0
# of centers using form	10	19
Sample size	69	123

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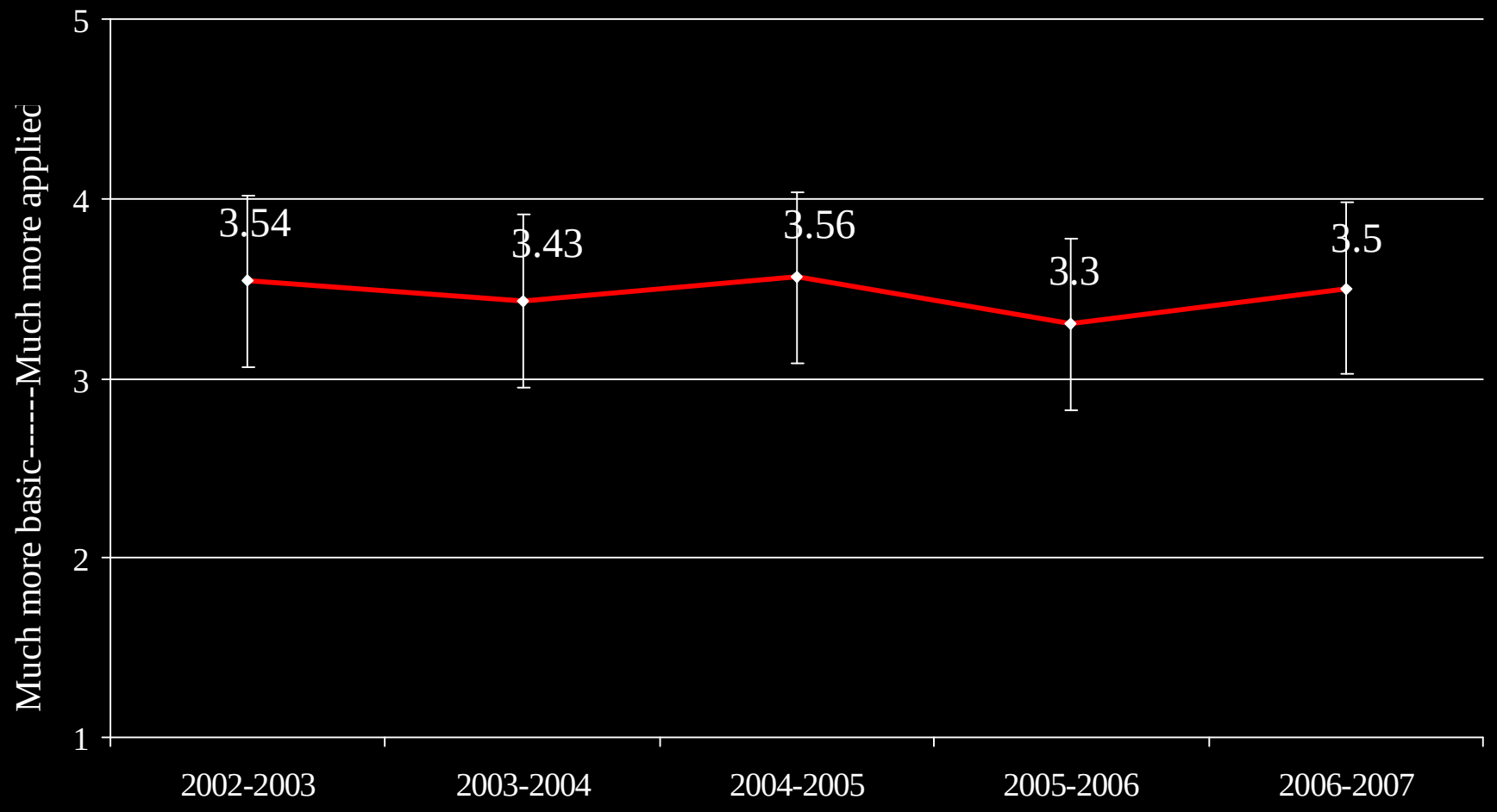
Compared to the research projects that you typically conduct outside the Center, would you describe your Center-funded research as:

Industry/University Cooperative Research Centers



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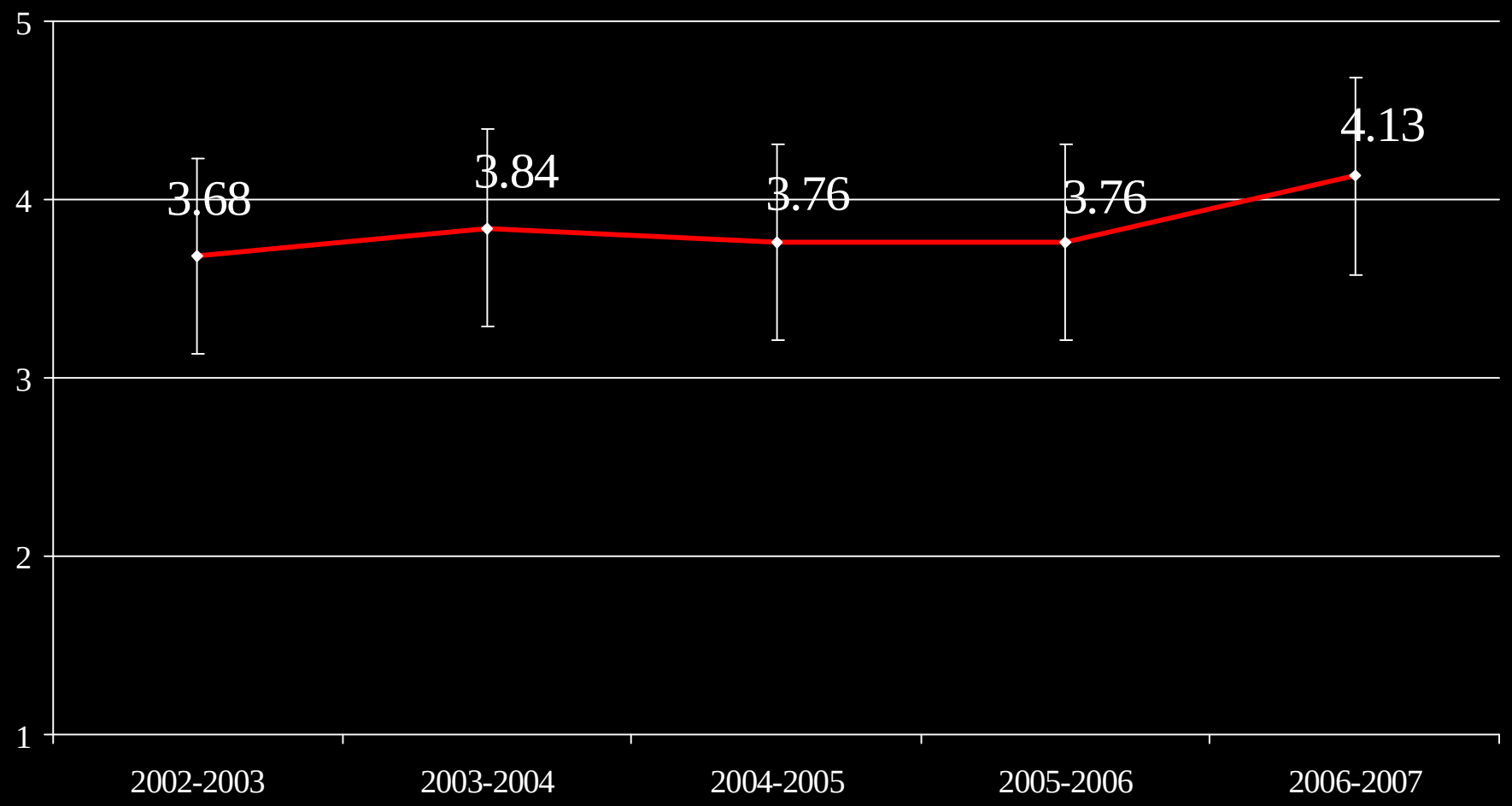
During the past year, how satisfied were you with the quality of center-supported research program?

Industry/University Cooperative Research Centers



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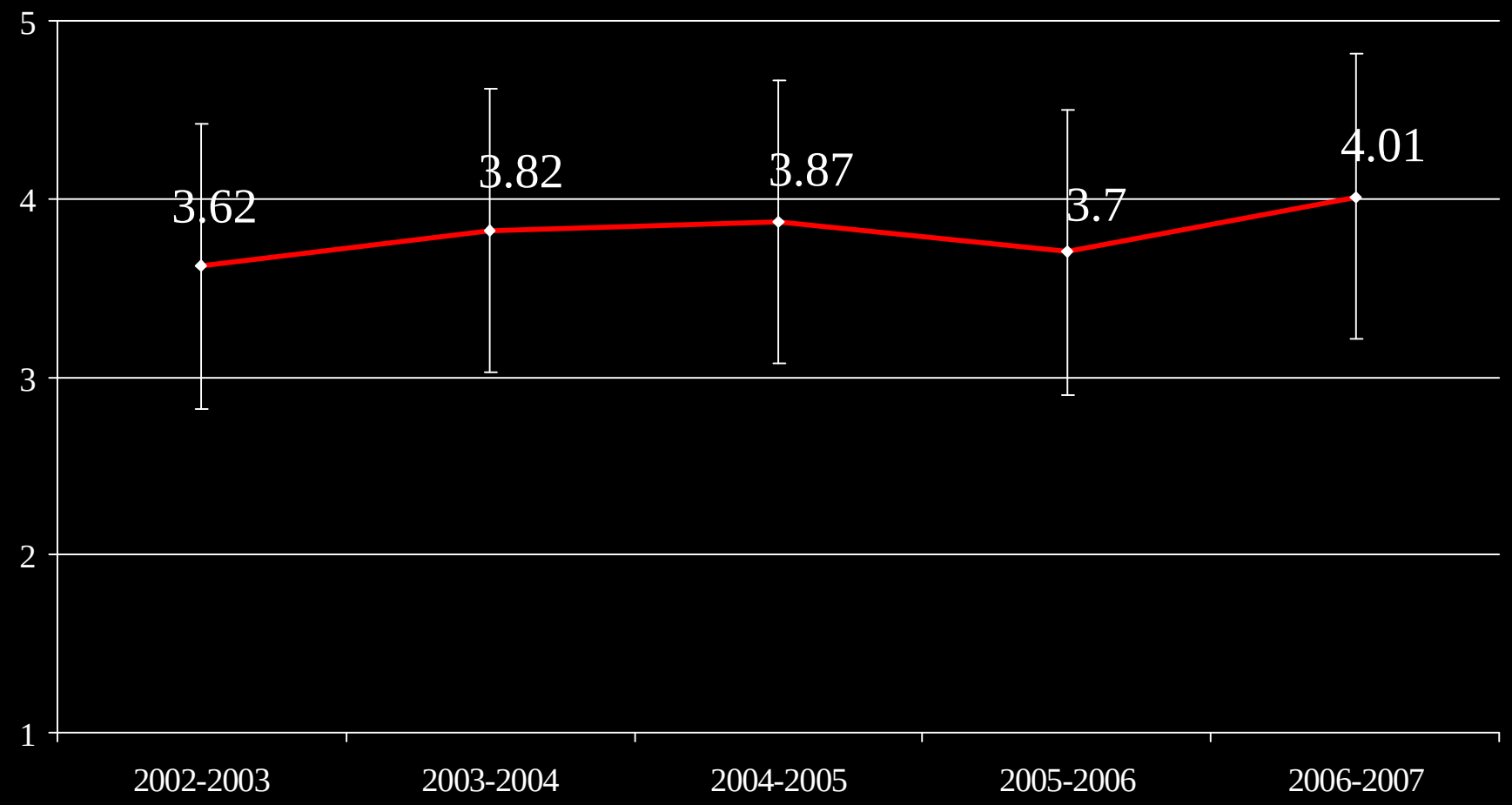
During the past year, how satisfied were you with the relevance of the Center's research program to my professional goals?

Industry/University Cooperative Research Centers



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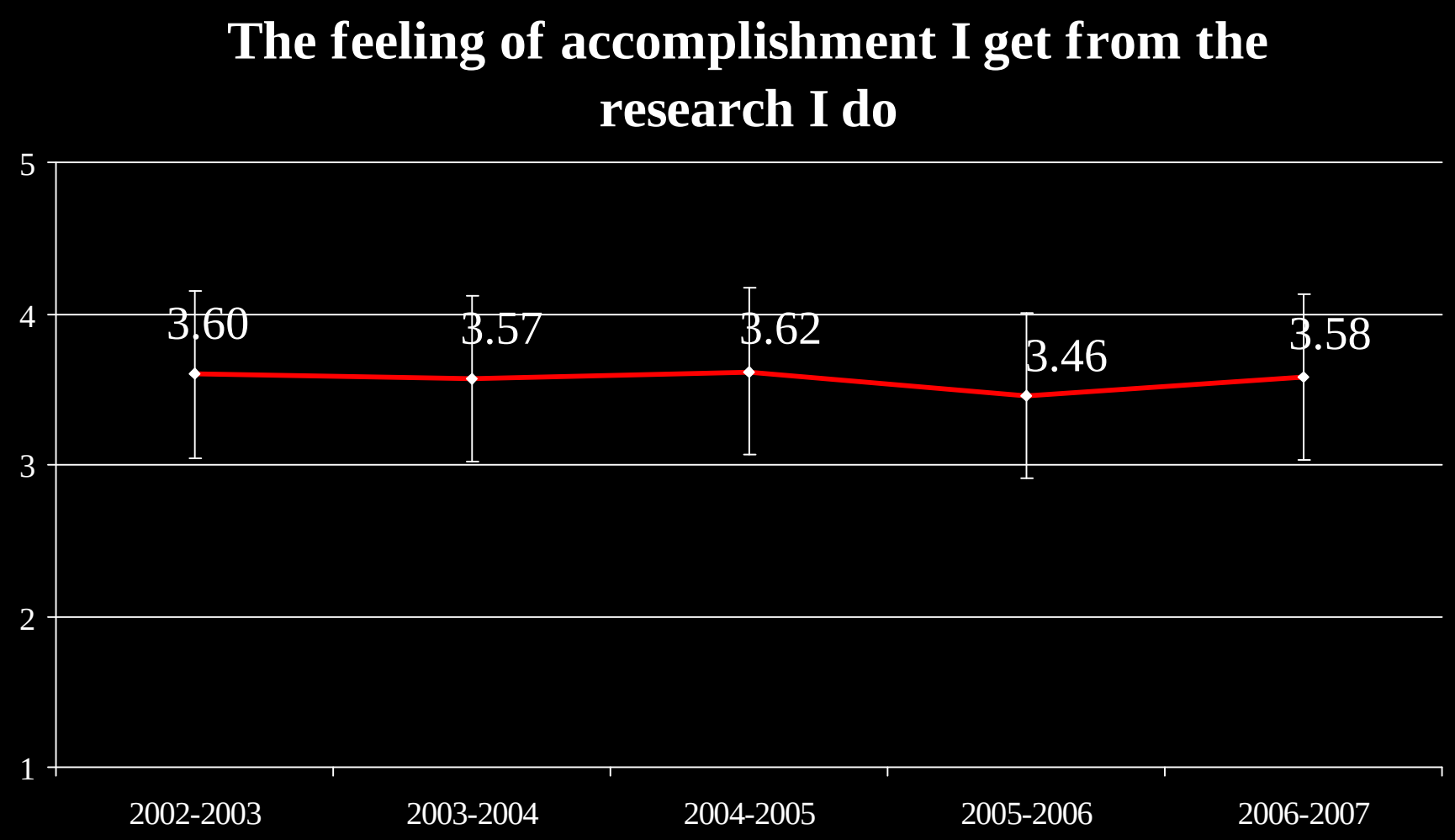
During the past year, what impact has participation in the Center had for YOU in the following areas?

Industry/University Cooperative Research Centers



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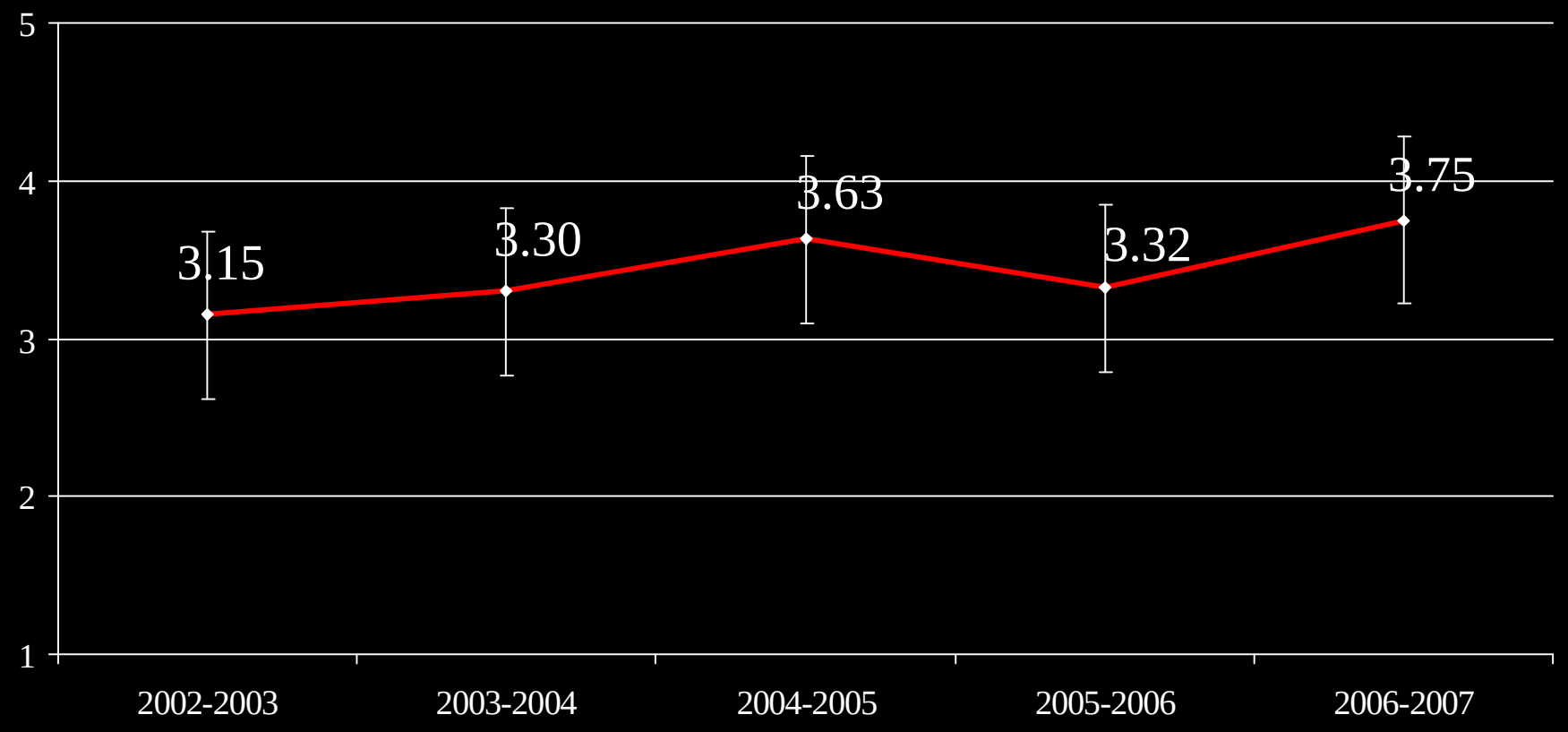
During the past year, what impact has participation in the Center had for YOU in the following areas?

Industry/University Cooperative Research Centers

Opportunities for research contracts/grants



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Industry/University Cooperative Research Centers

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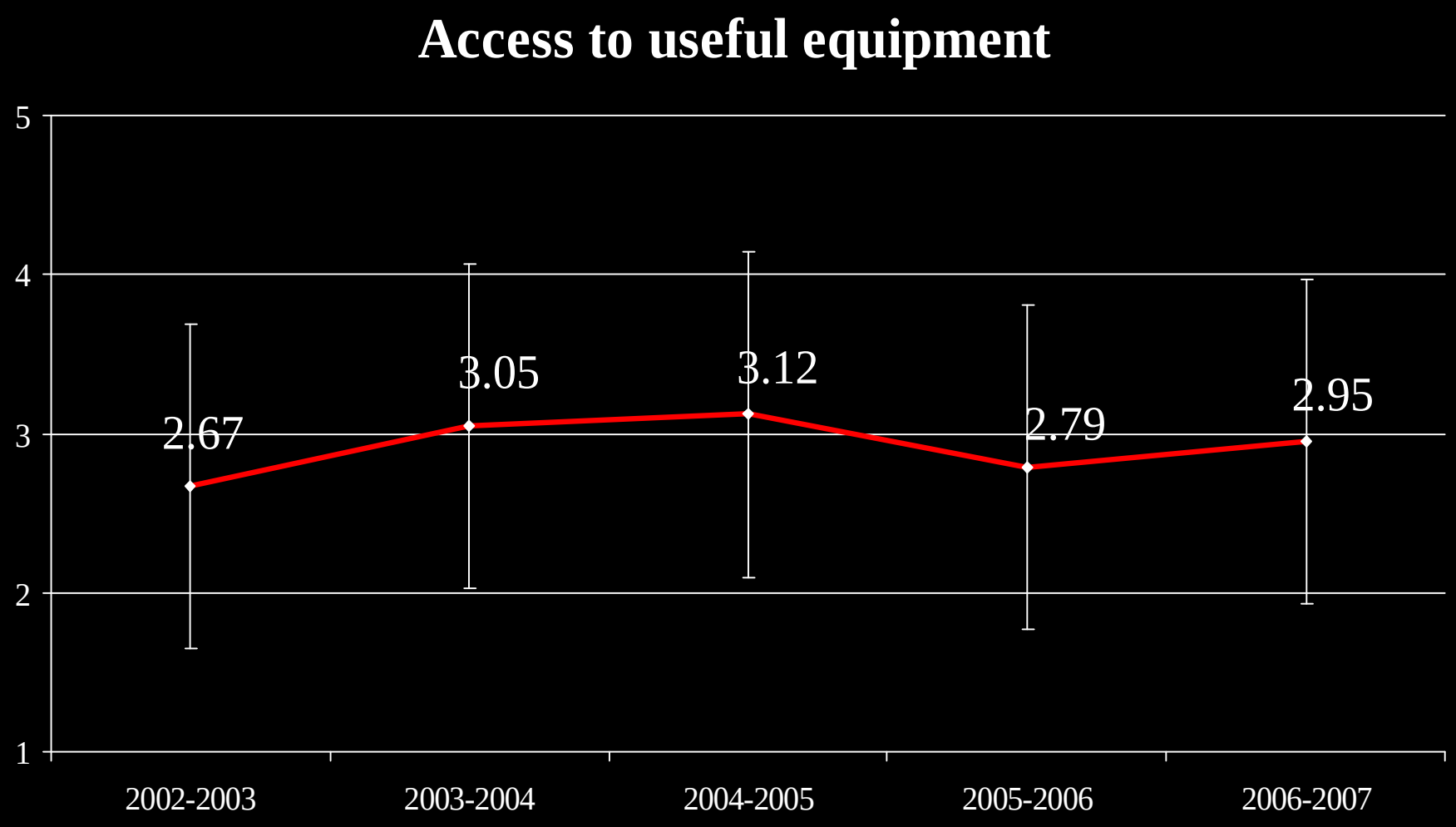

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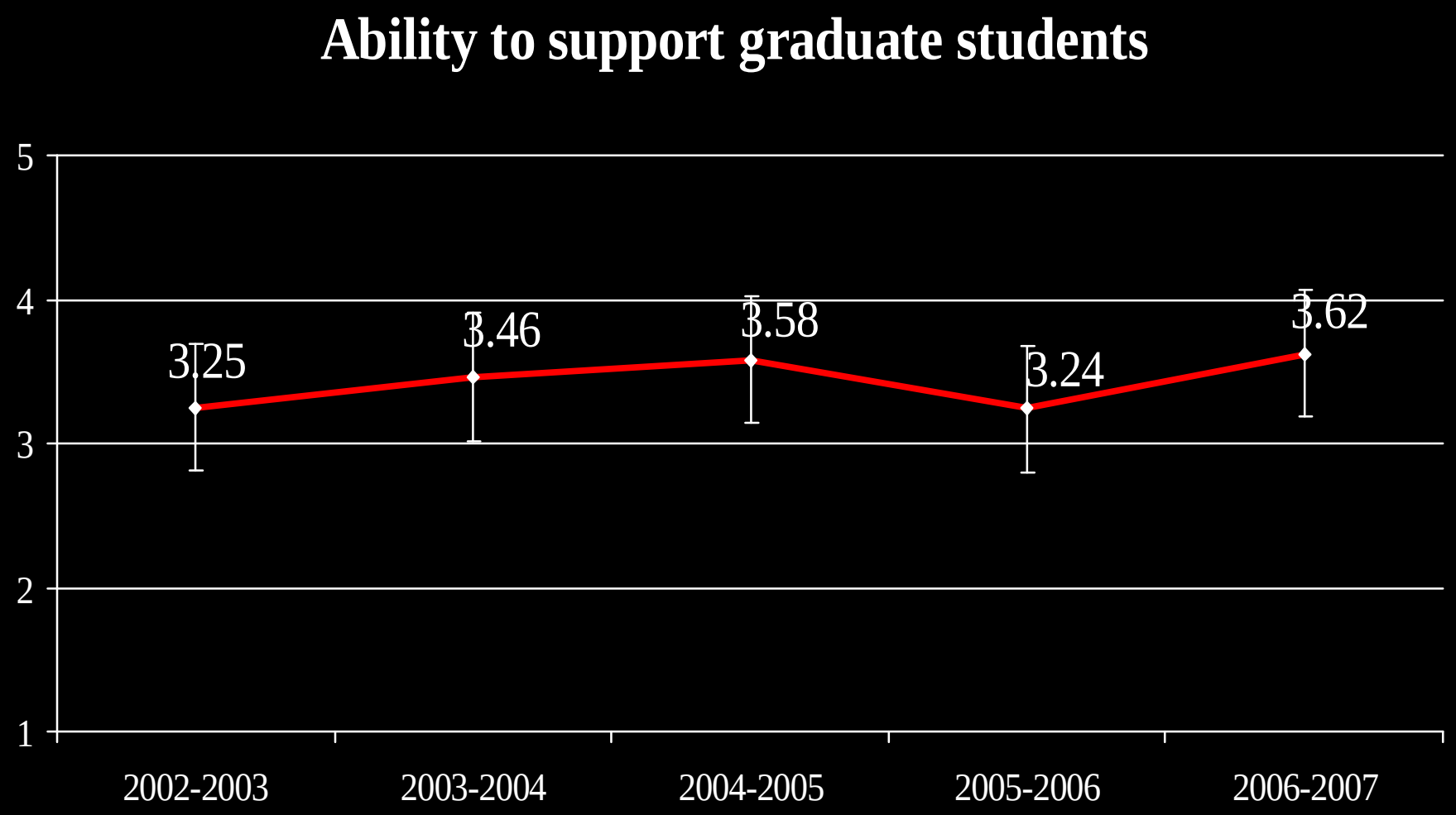

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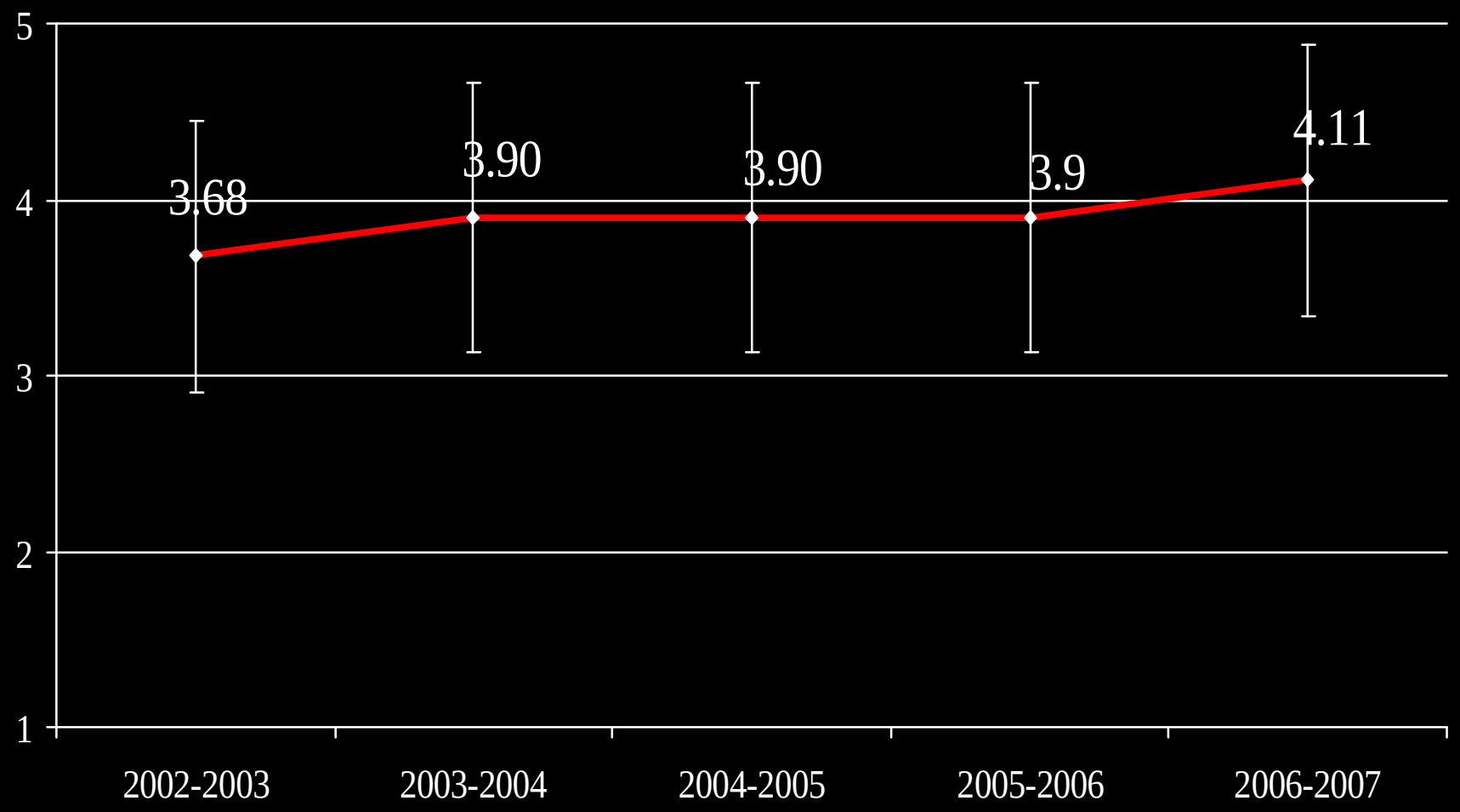
During the past year, how satisfied were you with center administrative operations?

Industry/University Cooperative Research Centers



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How Should These Process/Outcome Results be Used?

Industry/University Cooperative Research Centers

- By comparing means, medians, and standard deviations, evaluators can see how their centers compare to national "norms"
- Insert national data into industry software tools for this year/last year comparisons with your center
- Move current center means to previous year in e-mail software package

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