

# NSF Phase IIB Recipient Survey



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# Background

- Based on research commissioned by the STEP Board at the National Research Council
- Views expressed do not represent the National Research Council
- Preliminary findings only
- Summary of a paper submitted to the STEP Board

# Survey Objectives

- Understand the impact of NSF Phase IIB by developing new data on the impact of NSF Phase IIB funding on recipient companies
- Gather information about recipient views of the program
- Identify possible areas of strength and weakness for further analysis and possible modification
- Provide an empirical basis for Committee findings and recommendations

# Survey Methodology

- Survey all Phase IIB award recipients 1999-2009
- 281 awards + 281 control group respondents
- Principal Investigators targeted where possible
- Deployment:
  - Web based survey
  - Four rounds of emails
  - Two rounds of voicemails

# Control group

- Selected from NSF Phase II recipients
  - No Phase IIB for surveyed project
  - No previous Phase IIB for company
- Identical sample size
- Matched by year of award, grouped into three periods
- Randomization: Excel randomization function identified projects for survey
- Same base questionnaire
- Same email/voice mail drops.
- Extra questions for Phase IIB projects only about experiences with the program.

# Identifying statistical significance

- Small sample sizes suggested minimal statistically significant differences....but we found some important differences
- Standard statistical tests used to identify them
- Three key points:
  - Small sample means large raw differences for differences to be significant
  - Some differences not statistically significant but still potentially valuable
- Paper will contain detailed discussion

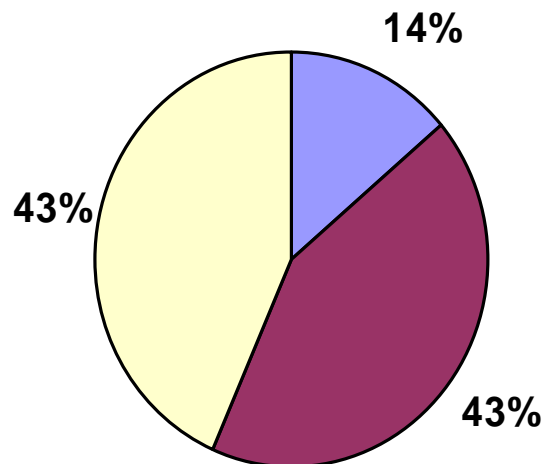
# Limitations of survey research

- Potential sources of bias in both directions  
Commercialization lags awards, often by many years
  - Successful and more recently funded firms are more likely to respond
  - Success is self-reported
  - Small sample size
  - Failed firms are hard to contact
  - Surveys are snapshots and do not capture subsequent commercialization
- *Not perfect, but least imperfect methodology.  
Much better than anecdote and speculation*

# Excellent response rates

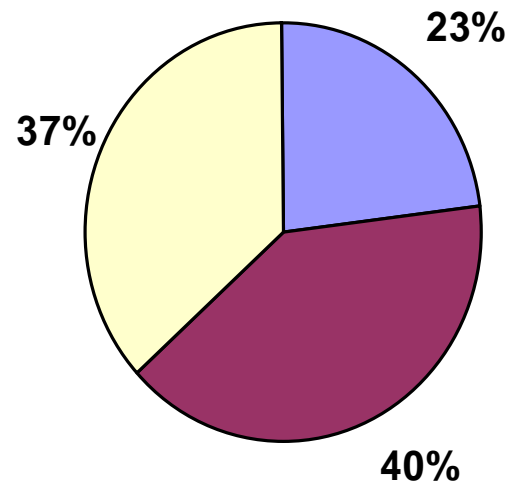
- Very strong response rate for this kind of survey
  - 43% completion overall for Phase IIB
  - 40% for control group
  - At least 50% for both groups after excluding bounces

Phase IIB

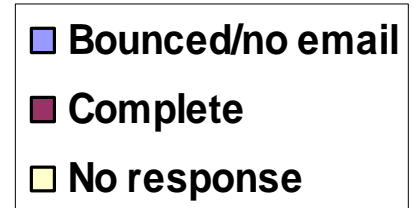


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Control

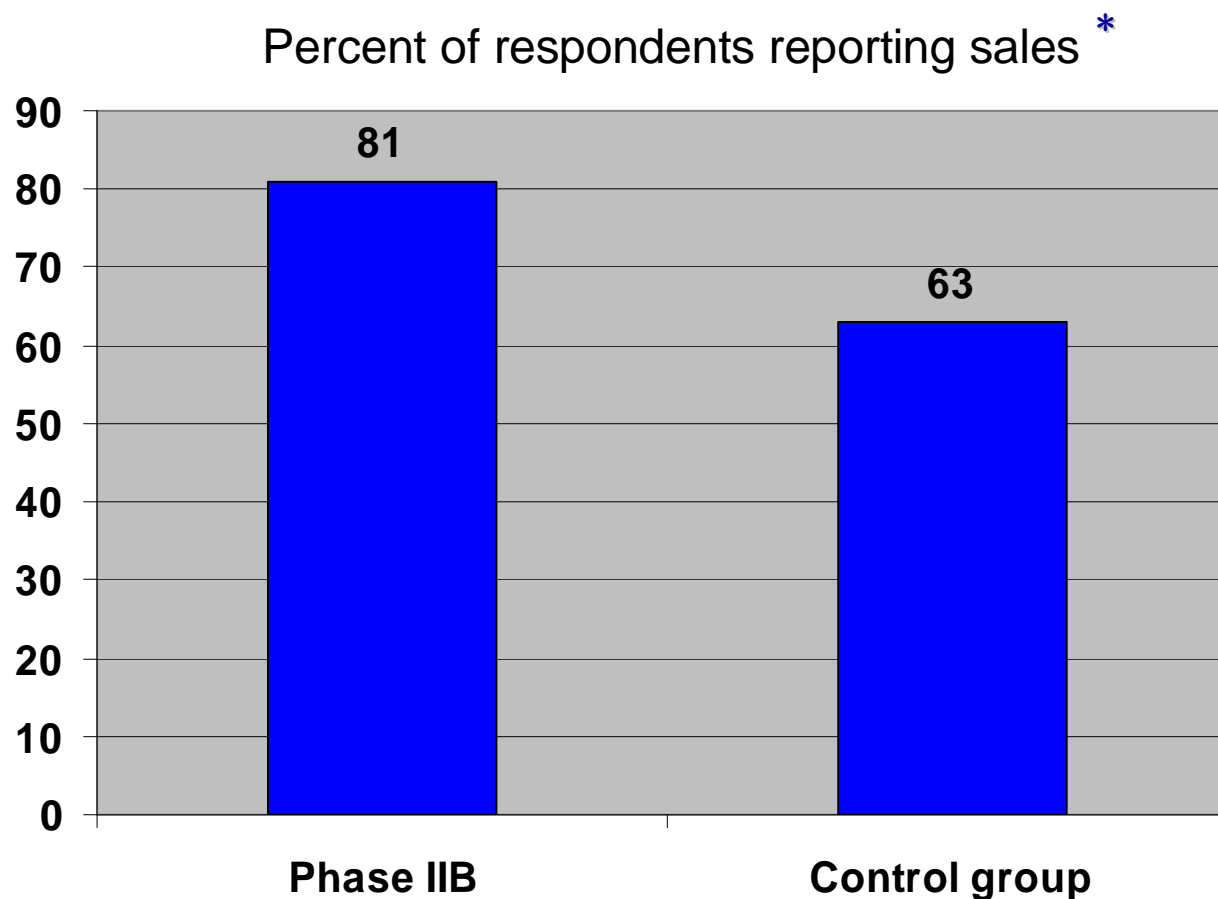


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# Survey responses

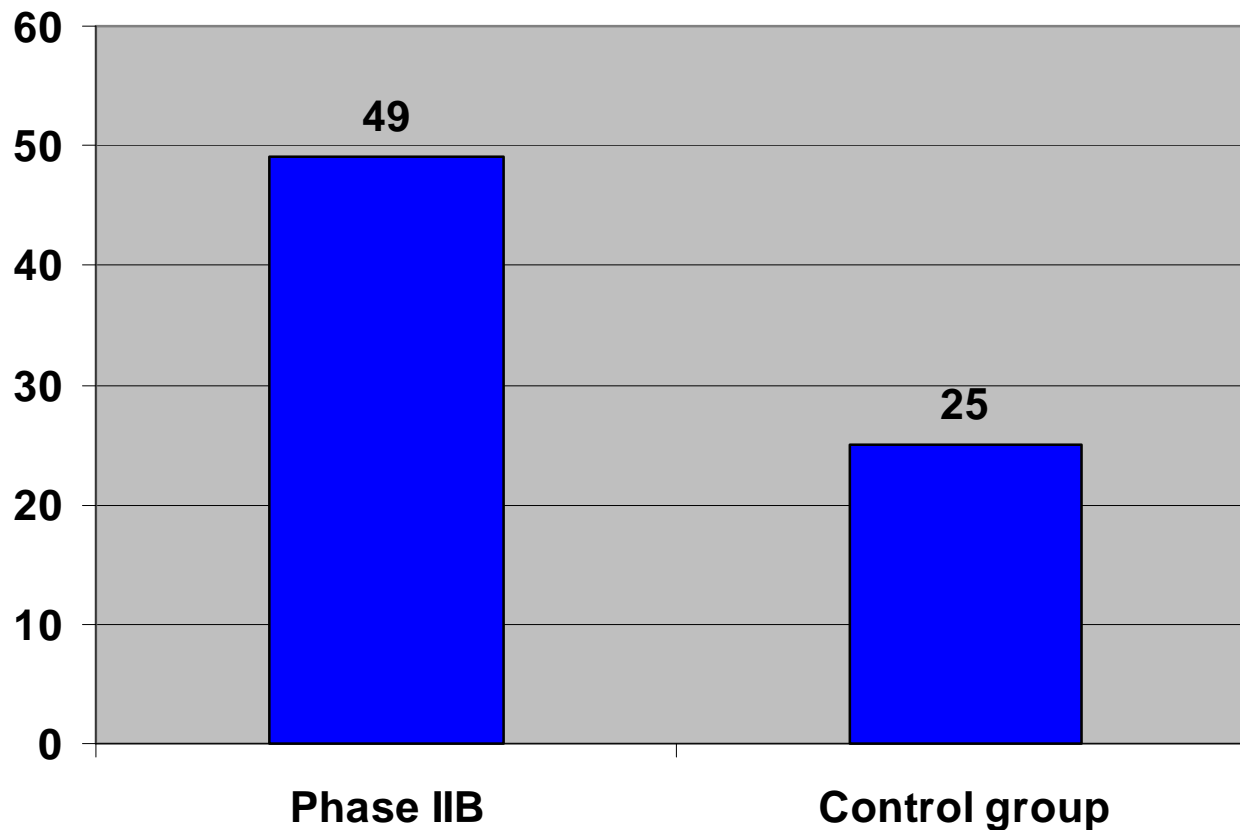
# Success in reaching the market: Both succeeded, Phase IIB more so



\* = Statistically significant differences between groups

# More technology in use

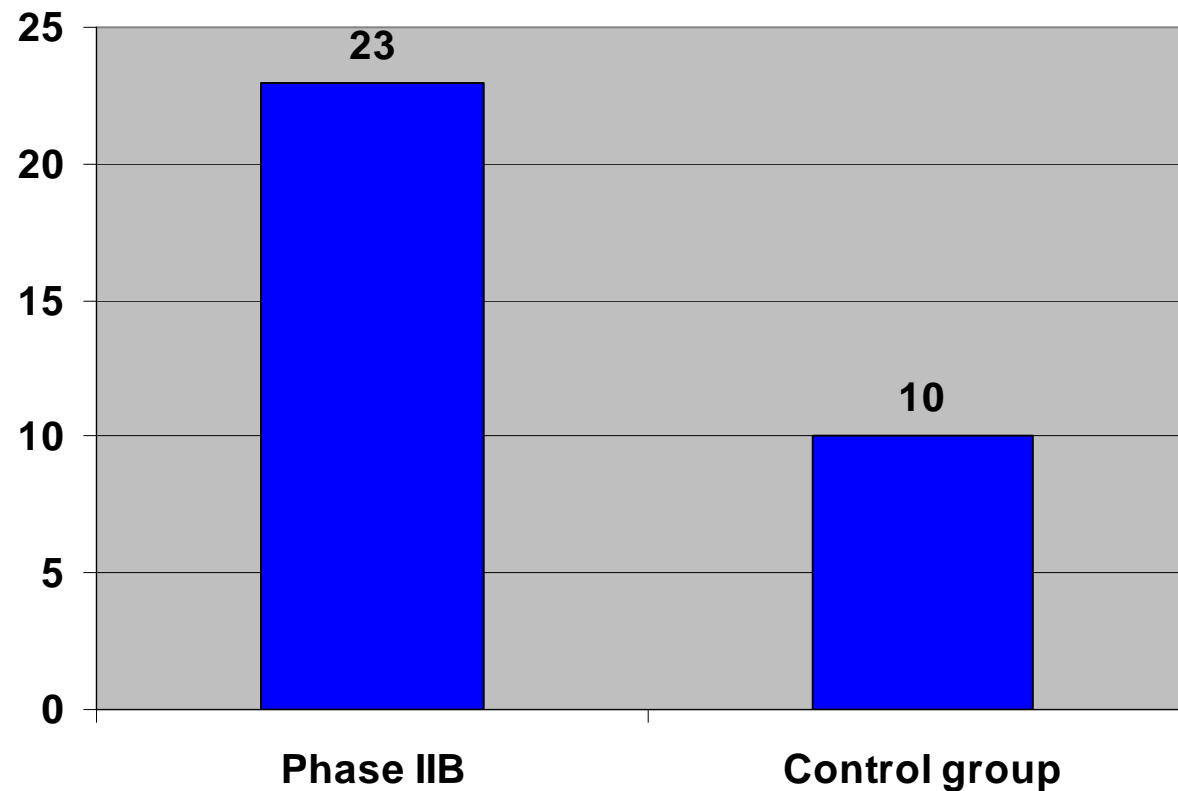
Percent of respondents reporting products currently in use \*



\* = Statistically significant differences between groups

# More big winners

Percent of respondents reporting sales > \$3M \*



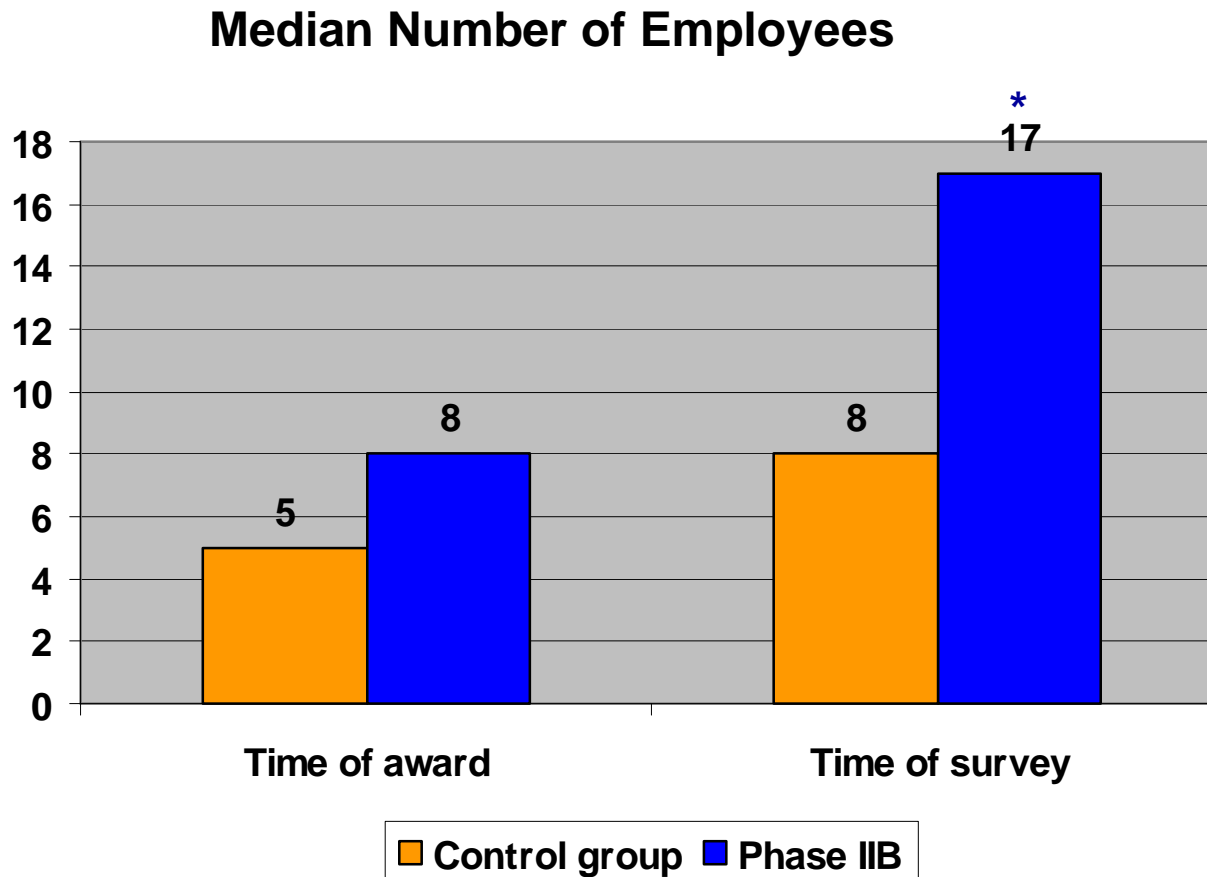
\* = Statistically significant differences between groups

# Expanded employment

- Phase IIB projects reported:
  - Higher employment growth\*
  - Fewer very small firms (under 5 employees)\*
  - Hired and retained twice as many project-related employees on average.\*
  - Puzzling diversity: More female PI's (18% vs. 7%)\*
  - Twice the median employment\*

\* = Statistically significant differences between groups

# Faster employment growth



\* = Statistically significant differences between groups

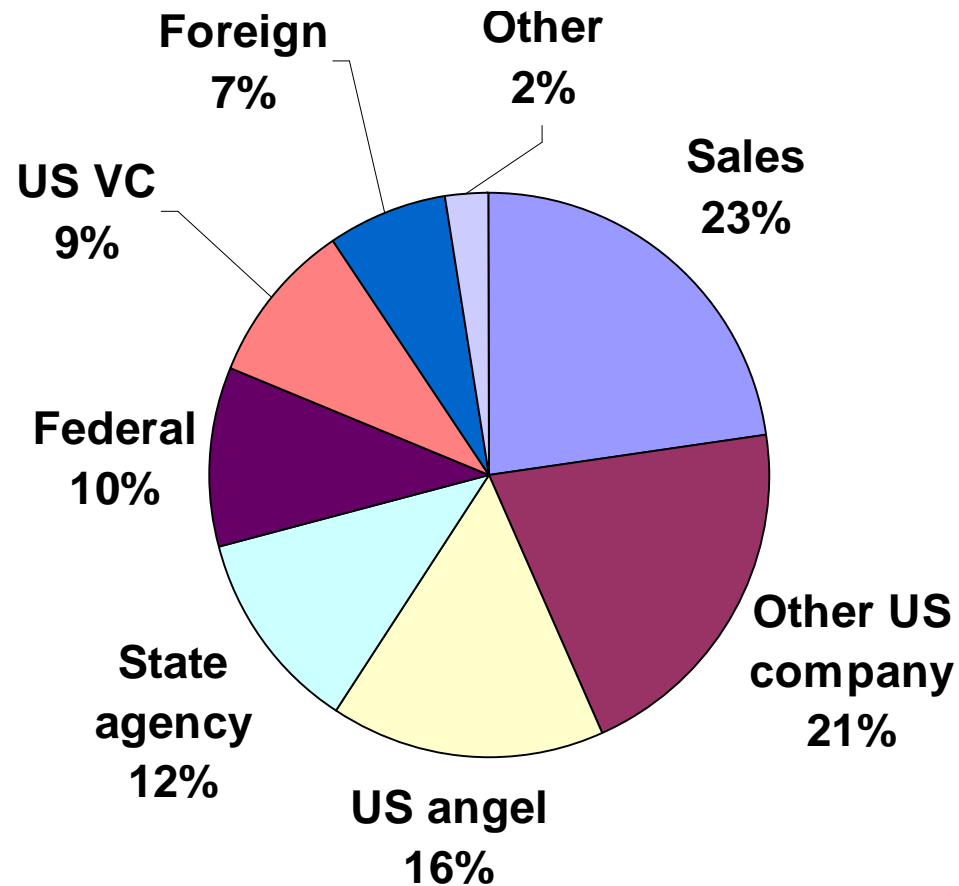
# Diverse source of matching funds

- Phase IIB helps attract diverse additional investors and funding:
  - Considerable investment: Attracted \$651,000 (average) matching funds
  - New investors: 30% of matching funds come from new private sector investors
  - Phase IIB made a difference: More than half said Phase IIB mattered a great deal or drove the process of acquiring investment
  - Only about 10% from venture funding

\* = Statistically significant differences between groups

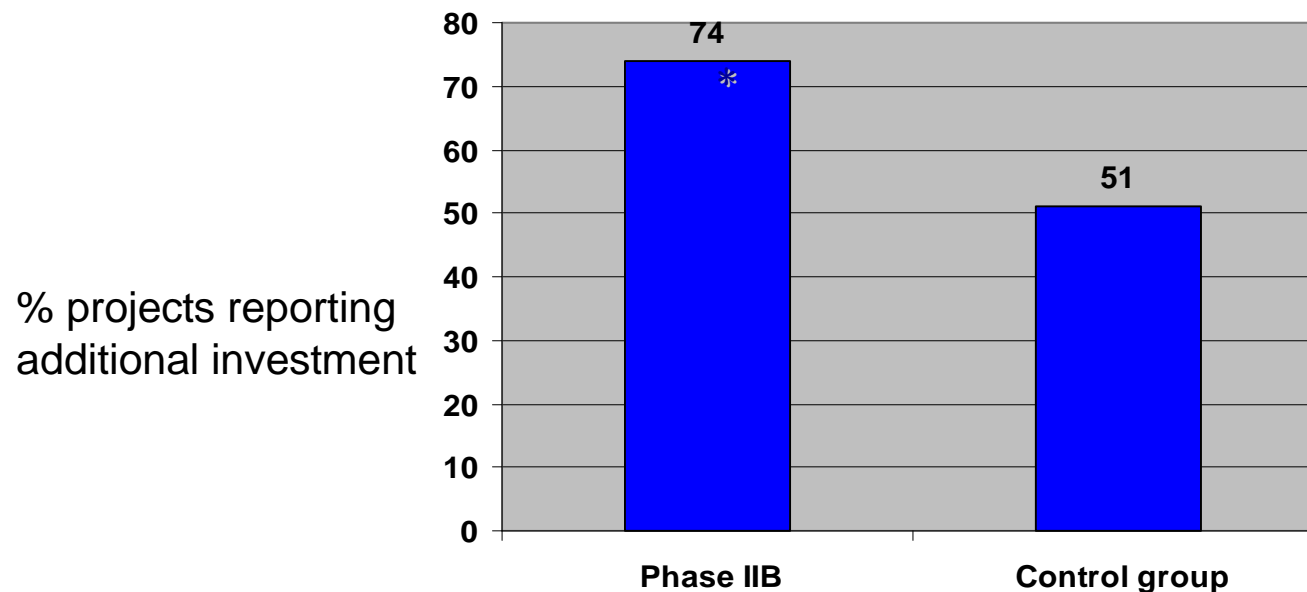
# Sources of matching investment

(% of responses identifying each source)



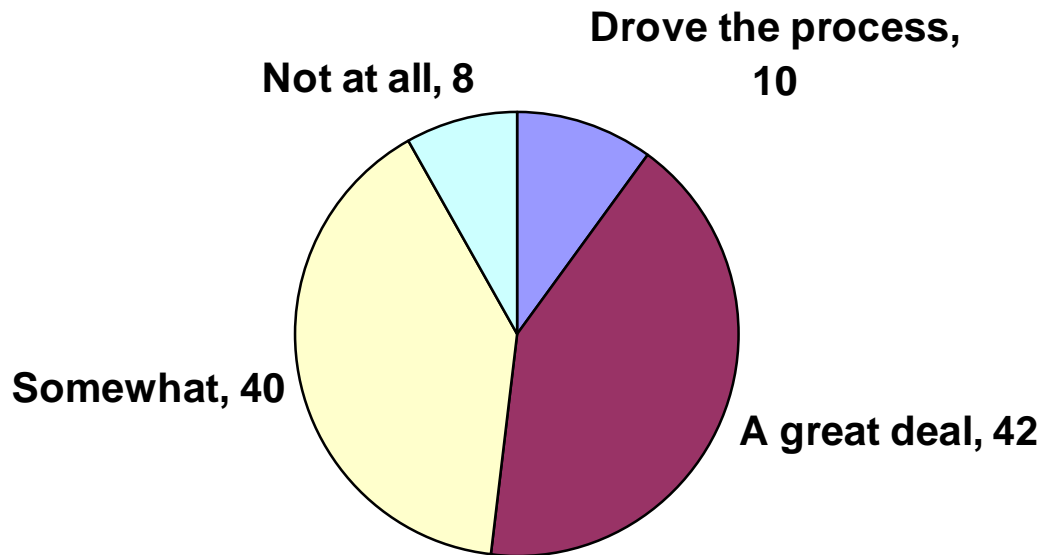
# More follow on investment beyond matching funds

- Phase II projects successfully acquired ongoing investment:
  - Significantly more projects had follow on investment \*
  - Almost 60% of Phase IIB group reported additional funding at > \$500,000
  - Average additional investment for Phase IIB: almost \$1 million



\* = Statistically significant differences between groups

# Substantial Phase IIB impact on further investment

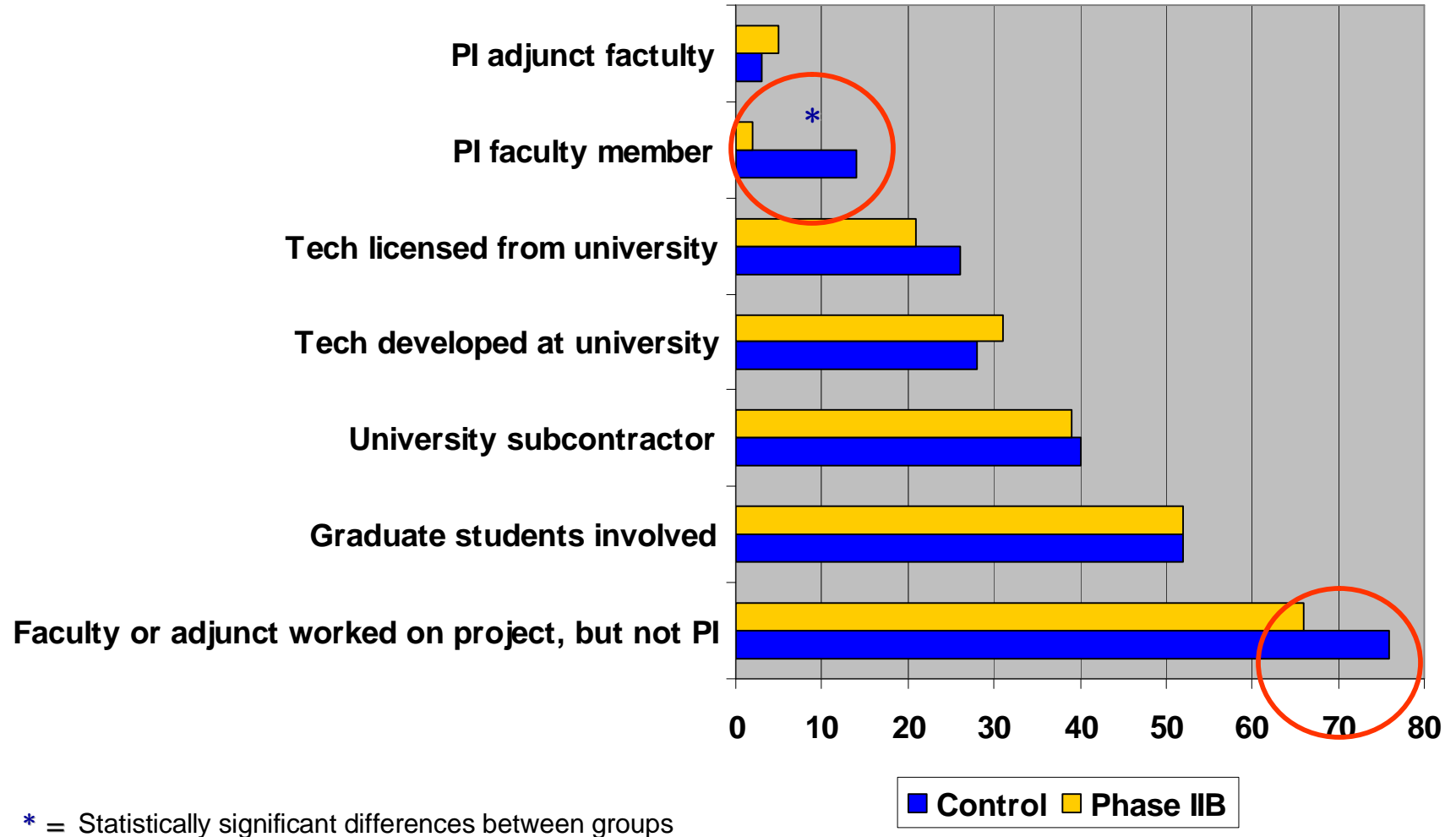


- 92% saw positive impact
- More than half substantial or transformative impact

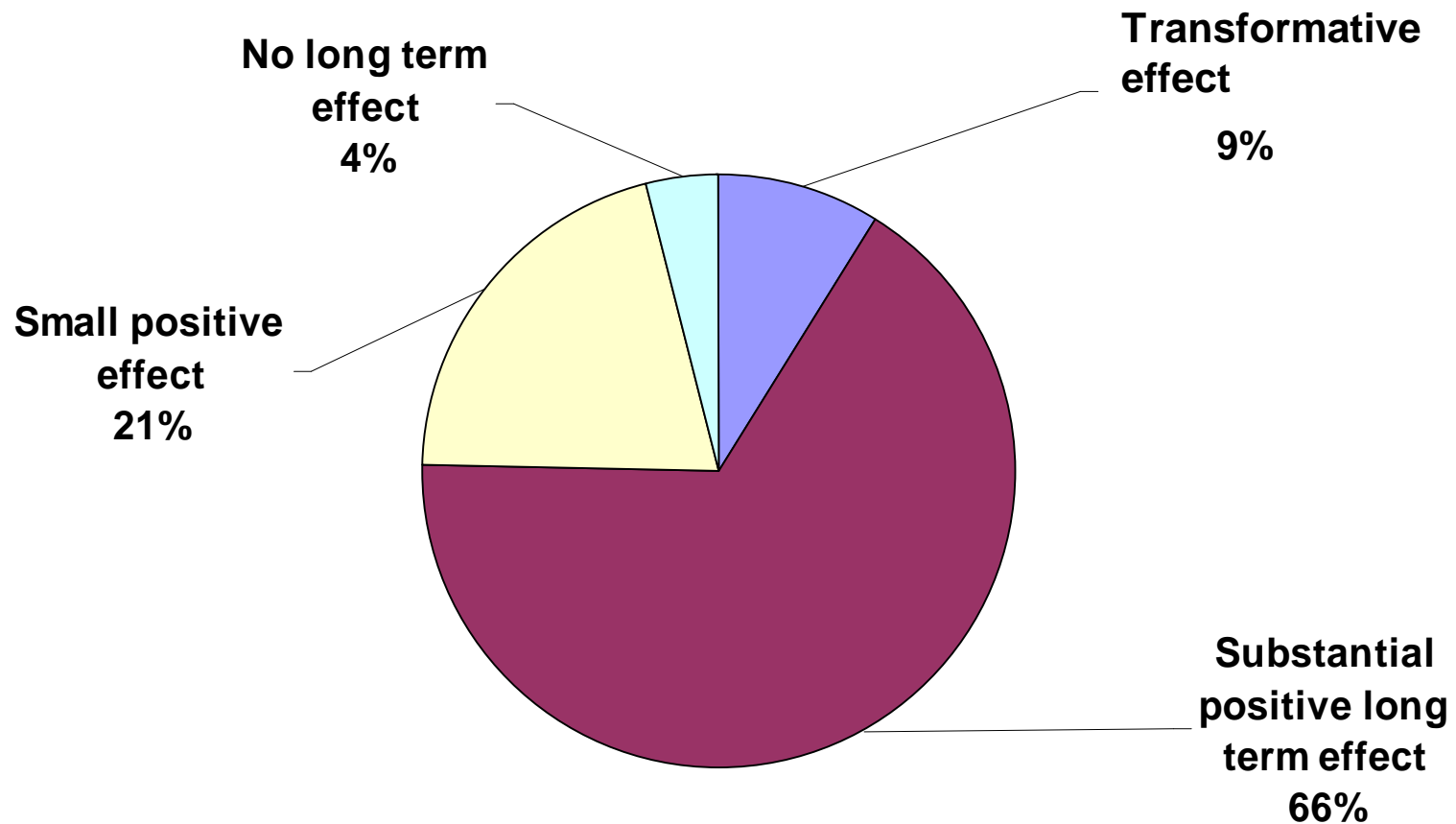
# Strong university involvement

- **Founders:** About 80% of projects in both groups had at least one university-linked company founder
- **Faculty:** More PIs were university faculty for control group projects.\*
- **Grad students:** More than 50% in both groups employed grad: students on their projects
- **Publications:** Phase IIB projects were more likely to publish in peer-reviewed journals\*
- **Patents:** No significant differences in overall patenting rates.

# University involvement



# Positive respondent views on long term impact of phase IIB



# Different kinds of positive impacts

- Recipients describe many kinds of positive impacts:
  - *“critical for growth and building critical mass”*
  - *“important bridge to NASA and Navy funding”*
  - *“successfully launched product”*
  - *“matching funds used for marketing”*
  - *“lent credibility with key client”*
  - *“Without Phase IIB, we would never have secured funding from our commercial partners.”*
- *Note: Report provides all comments in separate Appendix.*

# Program management

- ***Overall, recipients provided strong positive support for both the Phase IIB program and the work of NSF program officers.***
- **Recipient suggestions:**
  - **Revisit criteria for matching funds.** Possibly allow some in-kind contributions.
  - **Commercialization focus is good,** but review balance between rapid commercialization and powerful innovation
  - **Eliminate confusion about matching funds.** Even Phase IIB recipients mis-identified criteria
  - **No significant change to Phase IIB award size**

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