Measuring the Impact of Maine's Public Investments in Research and Development

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Agenda

- Context for Evaluation
- Maine's Research Design
- Lessons Learned and Challenges Ahead

Why Measure and Evaluate?

Evaluation is the collection, analysis, interpretation and communication about the effectiveness of programs undertaken for the public good.

- Aids in decisions about whether program should be expanded, continued, improved or curtailed
- Increase the effectiveness of program management
- To satisfy calls for accountability
- To measure the impact on the core problem

Key Concepts

- Evaluation is a process, not an event.
- Evaluation is for practical use, not to sit on the shelf.
- The questions to be answered are derived from the program itself.
- Compares “What is” with “What would have been” and “What should be”

Questions:

Have Maine's Public Investments in R&D

- Stimulated & sustained consistent, competitive economic growth?
- Increased university research capacity; an educated, technically skilled workforce; & commercialization of university technologies?
- Broadened the impact of nonprofit research institutions on the state's economy?
- Fostered growth of research-intensive companies, private sector R&D, & entrepreneurial activity?
- Increased the competitiveness of strategic technology sectors?

History of Project

- Maine substantially increased its ongoing investments in R&D starting in 1996
- Evaluation legislatively mandated, funded by “tax” on R&D investments
- Required outside experts to perform the evaluation of all public R&D investments.
- An ongoing process
  - initial evaluation and process design 2001
  - annual data collection
  - Five year evaluation in 2006
- Now in year eight

What's Covered

- Maine Technology Institute (grants to companies)
- Technology Centers (incubators)
- Maine Patent Program
- Small Enterprise Growth Fund (state venture capital)
- Seed Capital Tax Credit Program
- State EPSCoR Matching Funds
- State R&D bonds
- State R&D funding to the university system

Principles Used in Research Design

- If more than one program, establish consistent approach for all programs
- Ensure clear articulation of goals in as concrete terms as possible
- Be as rigorous as possible in design and analysis to increase validity and credibility, but make tradeoffs reflecting operational issues
- Gain evaluation at state level as well as data for individual program management

Research Design

- Annual web survey of all recipients of support from Maine's R&D related programs (recipients are surveyed for 5 years following award/ service)
  - Company & individual survey
  - Research institution survey
- Case studies – subject matter changes annually
- Innovation Index – annual statewide indicator trends – Maine is compared to US, New England, and other EPSCoR states

What Should We Count?

Start by understanding what the goals are:

To improve citizens' quality of life by:

- Creating and retaining high quality jobs (defined as higher pay), generally in technology-based businesses
- Creating and retaining (and in some cases, recruiting) high quality companies, defined as high growth, high paying), generally in technology-based industries
- Improving the stability and/or competitiveness of local and regional economy through innovation

Intermediate Indicators Used

- Researchers
  - S&E graduate students
  - Federal R&D grants
  - R&D expenditures
  - Patents
  - Publications
  - New Sponsored R&D with local companies
- Companies
  - Patents
  - Venture capital raised
  - SBIR and STTRs won
  - Other federal programs (ATP) won
  - M&A activity
  - IPO activity

End Outcome Indicators

- Average annual earnings of employees
- Number of high-technology companies in the state/region
- Number of scientists and engineers employed in the state/region
- Number of company births, especially high-technology
- Percent of revenue from outside state
- Revenue per employee (productivity)

How Evaluation Has Translated to Policy

- Our long-term data has allowed us to set the direction for innovation investment.
- We have been able to identify programs that need to be improved or eliminated.
- We have been able to document the value of the investment to Maine and built substantial support in the State House

Lessons Learned

- Garbage in – garbage out:
  - the importance of “customer” data maintained by program managers
- Carefully chose the case study topics
- Value is in longitudinal data – don’t make too many changes in instruments
- How you communicate is as important as the content

Challenges Going Forward

- Integration with broader Comprehensive Economic Development Evaluation
- Keeping the message fresh
- Communicating the value to John Q Public