

Ohio

Third Frontier

Innovation Creating Opportunity

Advisory Board and Commission Retreat

August 22 – 23, 2012

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Goals of the Third Frontier

Ohio Revised Code 184.01(A): “The purpose of the commission is to coordinate and administer science and technology programs to promote the welfare of the people of the state and to maximize the economic growth of the state through expansion of both of the following:

- The state’s high technology research and development capabilities, and
- The state’s product and process innovation and commercialization.

2011 Battelle Study: “OTF was created in 2002 to advance Ohio’s economic competitiveness and the generation of high quality jobs.”

Governor's Priorities for Third Frontier

- **Innovation**

- Foster innovation and promising technologies to bridge voids that discourage risk-takers, innovators and entrepreneurs

- **Capital & Talent**

- Grow capital & talent to create new technologies and new businesses

- **Commercialization**

- Spur Ohio's research institutions to commercialize products here in Ohio faster and more efficiently.

Operational Focus for Third Frontier

1. Faster ROI

- Target projects that produce a return-on-investment in three to five years

2. Leverage Strengths

- Build on those areas where Ohio has a natural advantage or “leg up” in the market.

3. Maximize Impact

- Coordinate when appropriate with JobsOhio to maximize the impact of Third Frontier’s resources.

Operational Focus for Third Frontier

4. Accurately Measure Results

- Develop rigorous metrics that accurately reveal the impact of the Third Frontier on commercialization, business development, and job creation.

5. Foster a Flexible Culture

- Develop a flexible culture in the Third Frontier to rapidly respond to high-impact, game-changing opportunities.

6. Sustainable Funding

- Where appropriate, make more Third Frontier funds available via loans instead of grants, which are then repaid and fund future additional Third Frontier efforts.

Agenda – August 22

- **Welcome**
- **Retreat Orientation**
- **Industry Trends**
- **Lunch**
- **Metrics**
- **Break**
- **Program Area Priorities**
- **Adjourn / Dinner**



Agenda – August 23

- **Breakfast (7:30 a.m.)**
- **Review and Confirmation**
- **Governance**
- **Break**
- **hiVelocity**
- **Wrap-Up and Next Steps**
- **Retreat Adjourns / Lunch**



Issue
Media
G R O U P



ATHENIAN
VENTURE
PARTNERS



Investing in Information Technology and Life Sciences

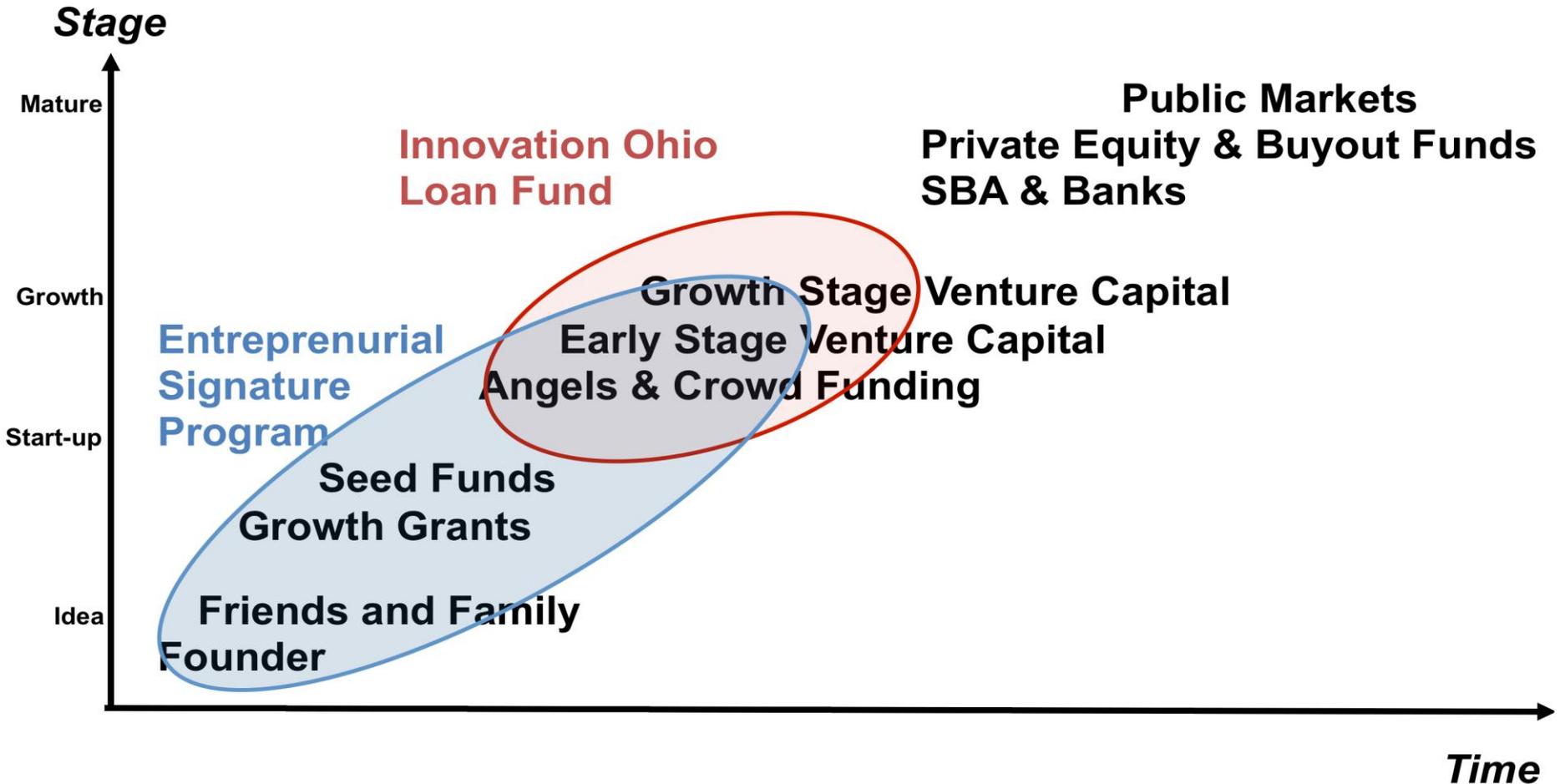
Ohio Third Frontier Retreat

Venture Capital in Ohio

Venture Capital 101

- ▶ VCs: Make equity investments - *and assume the business risks* – providing the capital necessary for building high-growth companies capable of bringing entrepreneurs’ innovations to the marketplace
- ▶ Diligence Process: Key to assuming the business risks of a developing company “on the brink” of breaking out
- ▶ Accountability: Primary measurements are IRR and multiples of invested capital; if done well, job creation and economic development (suppliers, etc) will occur as secondary benefits
- ▶ Funding Partners: institutional support and high net worth individuals are relied upon to underwrite a very large percentage of VC

Venture Capital 101



VC Industry – The Facts

- ▶ Investment opportunities driven by innovative entrepreneurs
- ▶ Pace of innovation doesn't slow down; it often quickens during economic downturns
- ▶ However, many VC firms around 10 yrs ago have been washed out and won't raise another fund:

*1,035 funds actively investing in 2000 vs 526 in 2011**

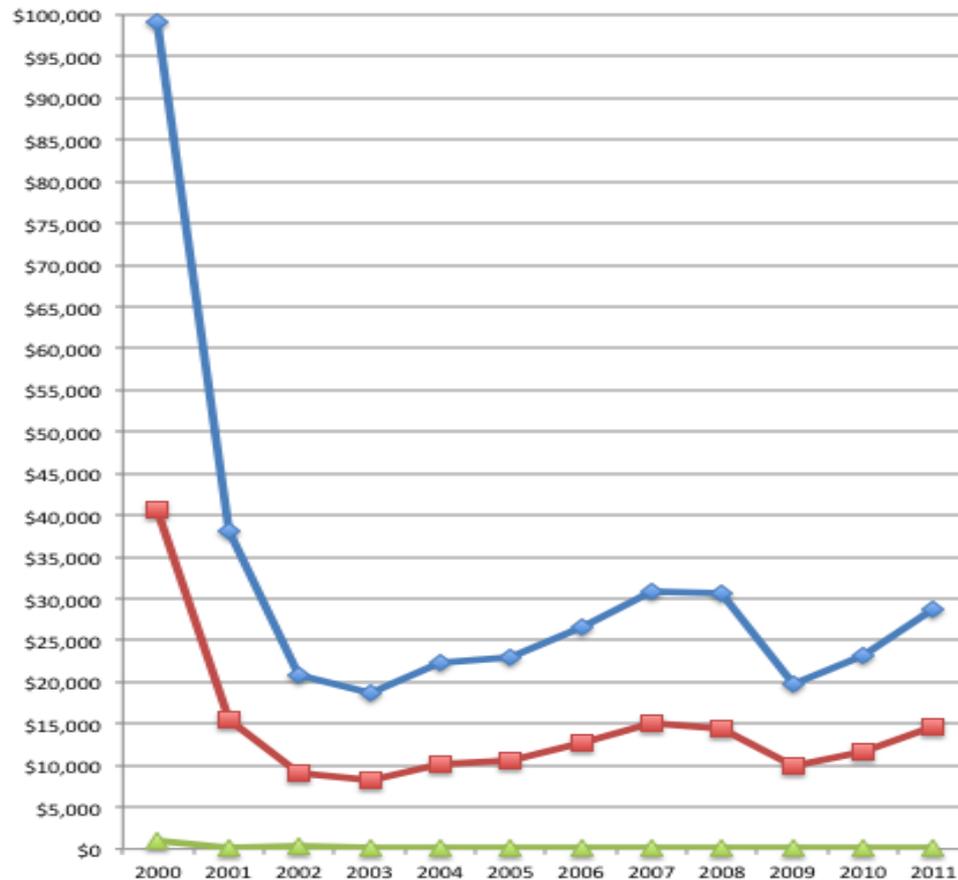
- ▶ Enormous concentration in California, Massachusetts and New York:

2011 investment activity:*

USA \$28,675M CA \$14,670M OH \$205M

VC Industry – The Facts

Venture Capital Investment by State (\$M)



Ohio is #19 in
VC dollars

VC Industry – The Facts

Top Five States By Percentage Invested Within State in 2011

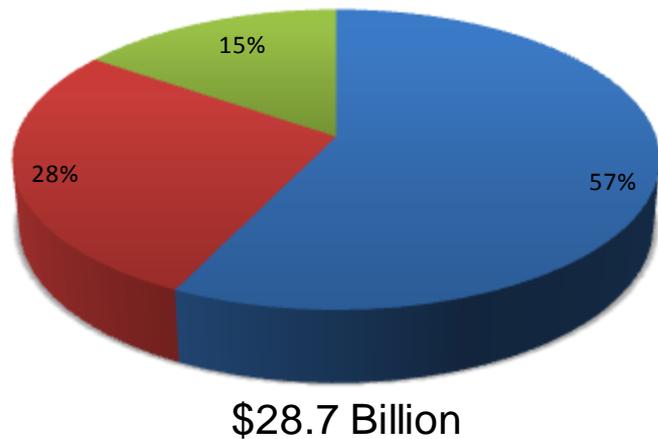
Fund Domicile	Pct. Invested Within State
Kansas	78%
Ohio	74%
California	71%
Tennessee	70%
Texas	54%

**Minimum \$20 million invested*

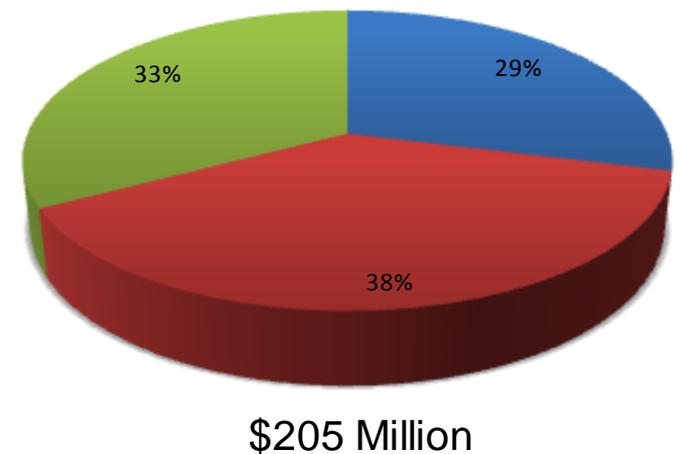
VC industry – The Facts

2011 Venture Capital Activity

National
% VC Investments per Sector



Ohio
% VC Investments per Sector *



- Information Technology
- Medical/Health/Life Science
- Non-High Technology

Source: 2012 NVCA Yearbook

*Source: 2010 Ohio Venture Capital Report

Athenian: Ohio-based VC since 1995

- ▶ Team: Five partners with complementary skills that have worked together for a decade or more, with durable professional relationships pre-dating Athenian; the team is currently managing \$105M of committed capital that it has turned into >\$350 M of total portfolio value
- ▶ Skills & Network: IT and Biomedical Science with cross-market knowledge and experience between Ohio, California and Massachusetts providing a broad perspective on deal quality with an enhanced syndication network
- ▶ Business Fundamentals: With a focus on capital efficiency, the team builds companies by balancing opportunities for sustainable growth, profitability, and cash flow – *in both buoyant and weak markets*
- ▶ Performance: Consistent top quartile results through several market cycles

Funds We Manage

Fund	Focus	Vintage Year	Status
Athenian Fund I	National	1998	100% Invested - Top Quartile
Athenian Fund II	National	2000	100% Invested - Top Quartile
AVP Ohio	Ohio / Central States	2003	90% Invested - Top Quartile - #1 Fund
Athenian Fund III	National	2008	Investing Phase

Ohio's Attractive Investment Environment



**Athenian Venture Partners Fund Ranked Number One by Preqin
2003 AVP Ohio Fund Named Leader in Its Vintage**

August 1, 2012

peHUB Wire--Tuesday, August 7, 2012

Athenian Boasts a Top Venture IRR for the 2003 Vintage



Venture Capitalist: Investing In Ohio Startups Pays Off Big

August 16, 2012

Ohio's Attractive Investment Environment

- ▶ Many more players in the financing ecosystem than 10 years ago
- ▶ Much greater deal flow
- ▶ Persistence pays off
- ▶ Rational market
 - Trends: Yes
 - Fads: No

Manta Media Overview

- Funding history
 - 1996: Angel financing
 - 2000-2005: Athenian led 3 rounds of institutional investment totaling \$17M
 - 2006: Innovation Ohio Loan Fund recipient of \$1.25M (repaid in full)
 - 2012: Partial sale to Norwest Venture Partners for \$44M
- Manta.com launched in Sep. 2005; transitioned old business
 - Top 40 Largest US Web Site (QuantCast)
 - 30M visitors per month and 3K small business owners joining every day
 - 2 consecutive years ranked as a Top 100 Most Valuable Private Internet Co.'s, *Silicon Alley Insider; Henry Blodget*
- Skilled Labor Growth
 - 2012 forecasted growth to over 135 total associates: will hire 50 new associates (average salary of \$85K)
 - 2011 totaled 85 associates: hired 35 new associates (average salary of \$85K)



Small Businesses Lack Online Presence



Linked in

- Career network
- Professional identity
- Hiring solutions
- Primary content: resumes



facebook

- Social network
- Personal brand
- Share personal life
- Primary content: shared conversations



manta

- Business network
- Small business's online presence
 - 80% of businesses have <9 emp.
 - The only web presence for many SMBs
- #1 SMB goal: New business channel
- Primary content: business profiles



Ranking & Press

No. 4 business/finance site



Top 50 U.S. websites



Top 100 most valuable startups (2nd Yr.)



The New York Times



THE HUFFINGTON POST

BUSINESS NEWS DAILY



Bloomberg Businessweek

Forbes



THE WALL STREET JOURNAL
Digital Network

Inc.

“ the fastest growing business site.....ahead of Morningstar, Smart Money, Fox Business, CNBC and Bloomberg



Building Manta in Columbus

- **Many turns in the road to success**
 - Re-built management; managed transition through 4 CEOs including founder, 6 VP Sales, 4 CFOs, 3 VP Technology; oversaw 2 RIFs
 - Led 7 equity rounds & numerous bridge loans; adapted to market conditions; stuck to fundamentals despite lack of outside validation
 - Judicious capital management, balancing growth & optimizing returns
- **Industry transformed from portals to search**
 - VCs worked with management to redefine the business
- **Why Ohio worked for Manta**
 - Investor persistence: Ohio investors fixed problems, didn't give up to chase next big idea
 - Capital-efficient investors didn't throw capital at Manta and wish for an overnight success
 - Talent and support: abundance of resources for entrepreneurs across state; sophisticated in-state technology talent



Prioria Robotics

Cost-effective & innovative unmanned systems solutions to civilian and commercial markets and to the nation's military, dedicated to making UAVs smarter

- **Maveric**



- Single-person portable & operable
- Weight 2.6 lbs / wingspan 29.5 inches
- Composed of advanced composite materials
- Bendable-wing design
- 46-60 minute endurance
- Camouflaged bird-like appearance



- **Merlin**

- Enables advanced navigation in Maveric
- Enables advanced sensor processing in other applications



Value-add of the VC

- Emergence of an industry: Athenian recognized a sustainable growth opportunity in the UAV space
- Due-diligence: Athenian expertise in IT systems, flight systems and airspace access
- Value-add: Athenian's position in the Ohio ecosystem was an important factor in Prioria's VC selection
 - Facilitating access to DHS dollars for counties in Ohio
 - Exploring the alignment of opportunities between Wright Patterson and Prioria



Impact to Ohio

- Jobs creation and business development:
 - Important Maveric components currently produced in Ohio
 - Additional new jobs via regional service centers to maintain, train and certify product & operations
- Benefit to state and municipal Police, Fire and Emergency units:
 - Reduced operating costs will extend cash-strapped budgets
 - Increase in capabilities
- Strategic industry sector:
 - Further establishes OH as North American hub for aerospace & aviation
 - Leverages OH's strengths in engineering, manufacturing and assembly
 - NASA Glenn Research Ctr & Wright-Patterson AFB, plus deep well of producers/parts suppliers
- Government currently best path to commercialization via Homeland Security Grant Program
- Opening of commercial market by Sep 2015 via new FAA regulations over civilian UAV flight

The Battelle Study

8 Growth Opportunity areas in 2006 & 2011

- ▶ Advanced Materials
- ▶ Aero-propulsion Power Management
- ▶ Fuel Cells and Energy Storage
- ▶ Medical Technology ✓✓
- ▶ Sensing and Automation Systems ✓
- ▶ Situational Awareness and Surveillance Systems ✓
- ▶ Software Applications for Business & Health Care
✓✓✓
- ▶ Solar Photovoltaics

Athenian's Activities and Outlook

Information Technology

- Cloud-based solutions: enterprise productivity, marketing solutions, process automation
- Mobile Business Solutions: mobile infrastructure and device management
- Digital Media: advertising models, technology, audience engagement

Healthcare

- Biomedical Sciences: specialty pharmaceutical, devices, diagnostics
- Personalized Medicine: theranostics, orphan and niche indications, individualized therapies
- Healthcare Business Technology: data-driven solutions, wireless and mobile healthcare technologies, electronic medical records

ESP Companies Introduced to Athenian

TechColumbus

3X Systems - IT
Toobla - IT
Znode - IT
Minimally Invasive Devices - HC
Cardiox - HC
ClearSaleing – IT
inmobly - IT

Jumpstart

Great Lakes Pharmaceuticals - HC
Cardio Insight - HC
CerviLenz - HC
iGuiders – IT
SpearFysh – IT

CincyTech

Akebia – HC
ThinkVine – IT
Rapid Diagnostek – HC
AssureRx – HC
BlueAsh Therapeutics – HC

TechGROWTH

Sanuthera – HC
Promiliad – HC
FirstBiotech – HC
E3 Technologies – cleantech w/
med device

VC perspective on Ohio ecosystem



Strengths:

- Growing deal flow
- More syndication opportunities
- Support for growing entrepreneurial activity



Challenges:

- It is challenging for Ohio VCs to raise capital from national institutions
- Ohio institutions are needed to support Ohio VCs with sustained commitment to the class
- Scale is a factor for Ohio's sub-\$200M funds
- How can we incentivize sustained commitment to VC in Ohio?

Summary

- ▶ VC Industry
 - National
 - Ohio

- ▶ Premier Fund
 - National Recognition
 - Challenging to Raise Capital in Ohio

- ▶ Fragile VC Environment

- ▶ Q&A

Evaluating the Impacts of Science and Technology Investments

Catherine S. Renault, PhD

August 2012

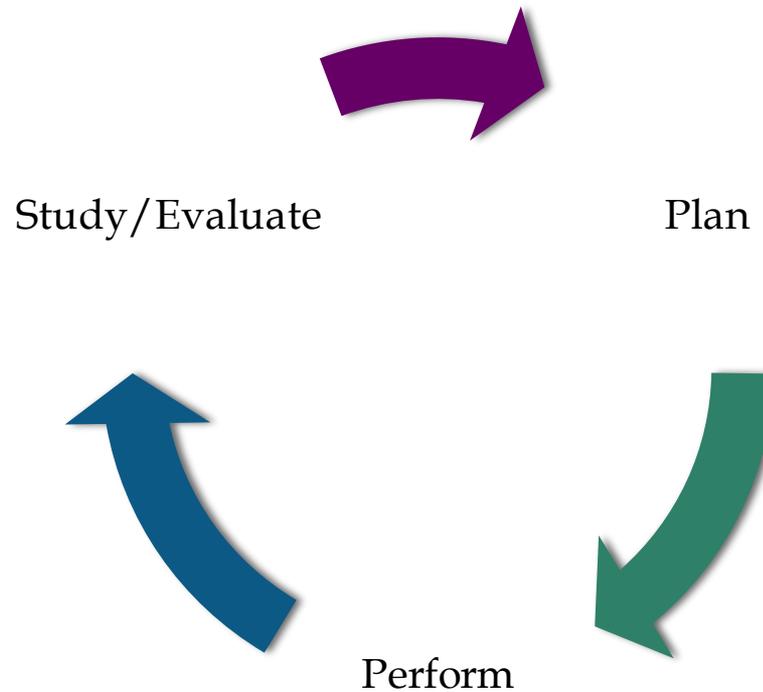




PART 1: WHAT YOU MEASURE
DEPENDS UPON WHAT YOUR
GOALS ARE

Evaluation is a Process...

Not An Event



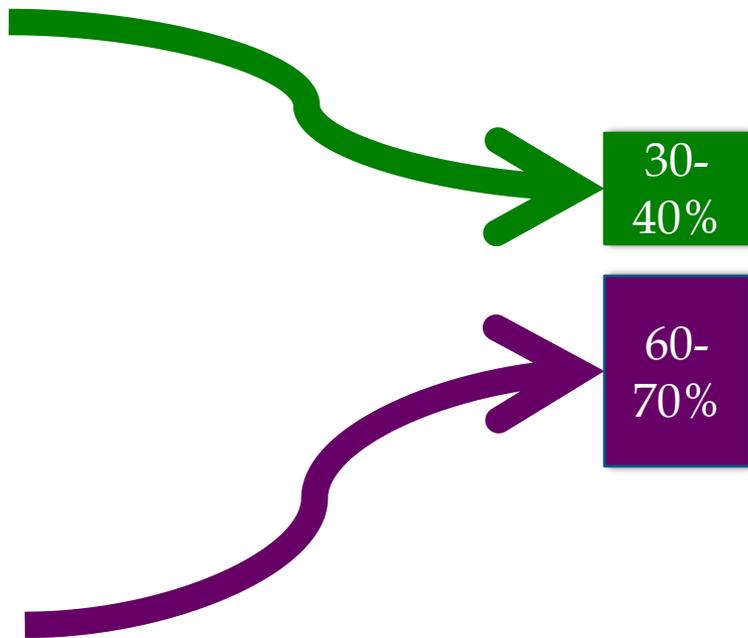
Evaluation compares **What is** with
What would have been and **What should be**

Use Logic Model to Decide What to Measure

Inputs / Resources	Activities	Program Outputs	Socio-economic Outcomes
<ul style="list-style-type: none">• Funding Provided• Staffing• Facilities Available• Partners Engaged	<p>Milestones and Deliverables</p> <p>Generated from tactics or tasks designed to achieve particular results</p>	<p>Program measures tied to specific Program Objectives</p> <p>Combined report of program impacts (or “predicted” program impacts)</p>	<p>Benchmark indicators of progress towards a Strategic Vision.</p> <p>Might not be directly tied to any program, but should be tied to Vision</p>

Basic Belief: Innovation Drives Economic Growth

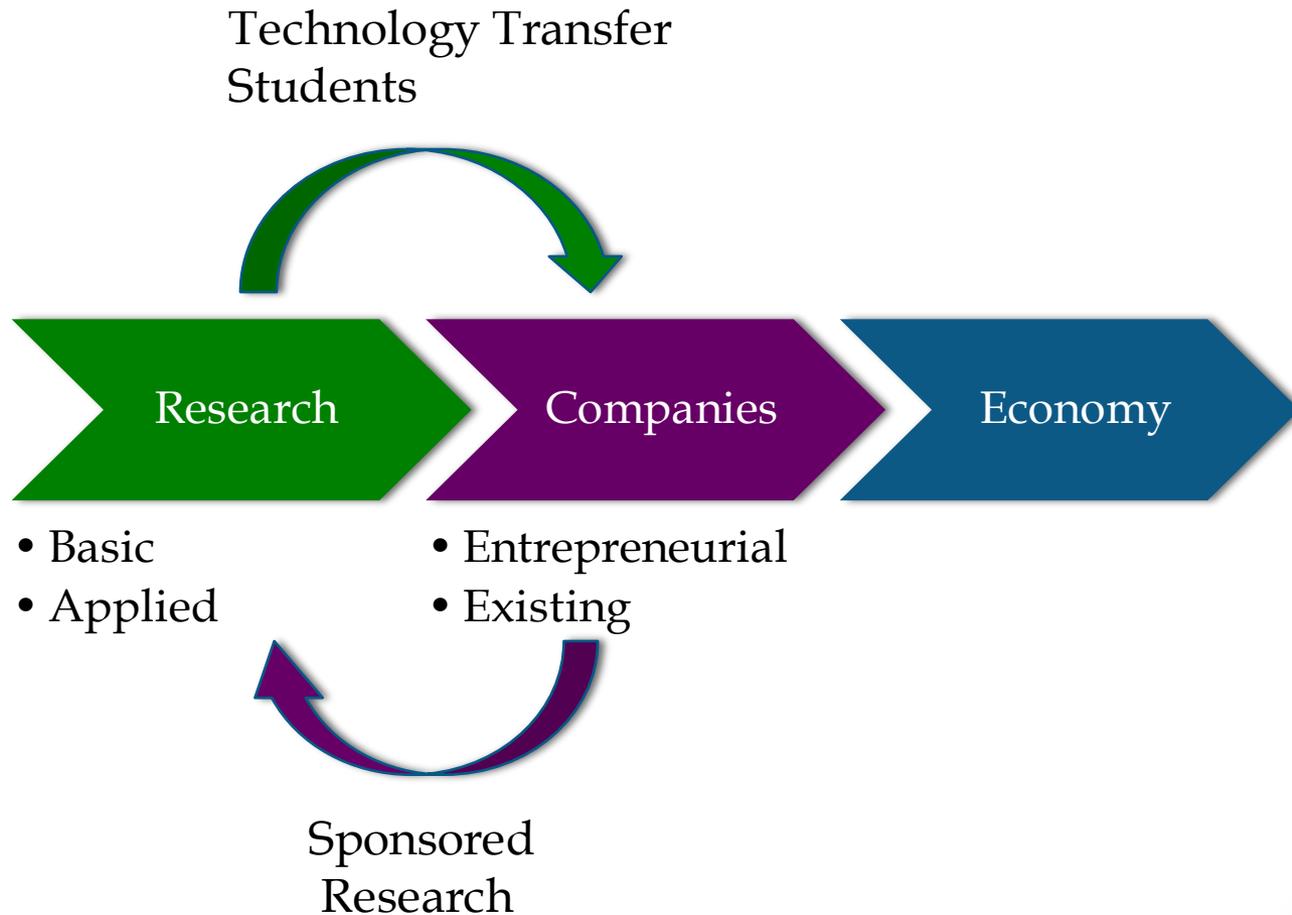
More inputs: more workers and more capital



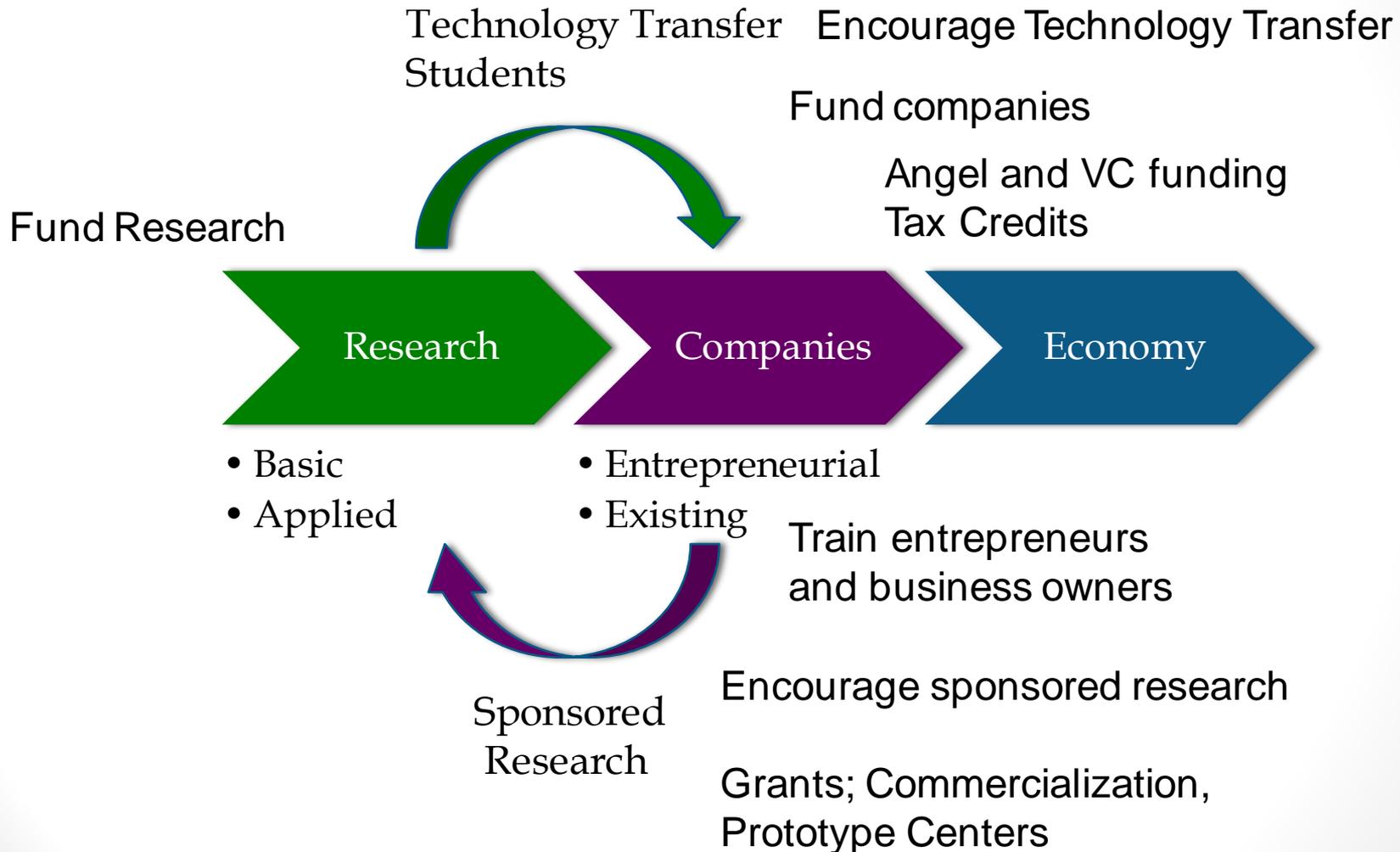
Multiple studies of many different economies show that innovation accounts for 60-70 % of economic growth

Innovation: Turning new ideas into reality

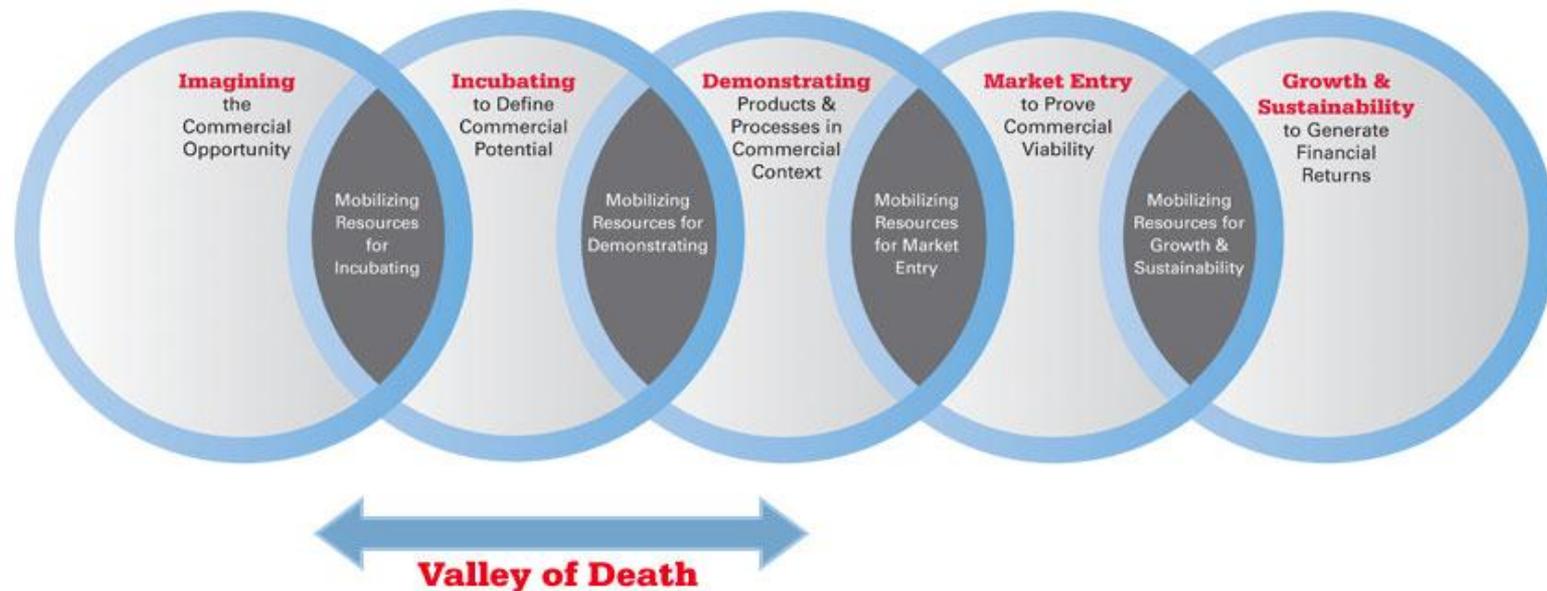
Generic Innovation Logic Model



Innovation Ecosystem Interventions



Third Frontier Framework Mirrors General Case



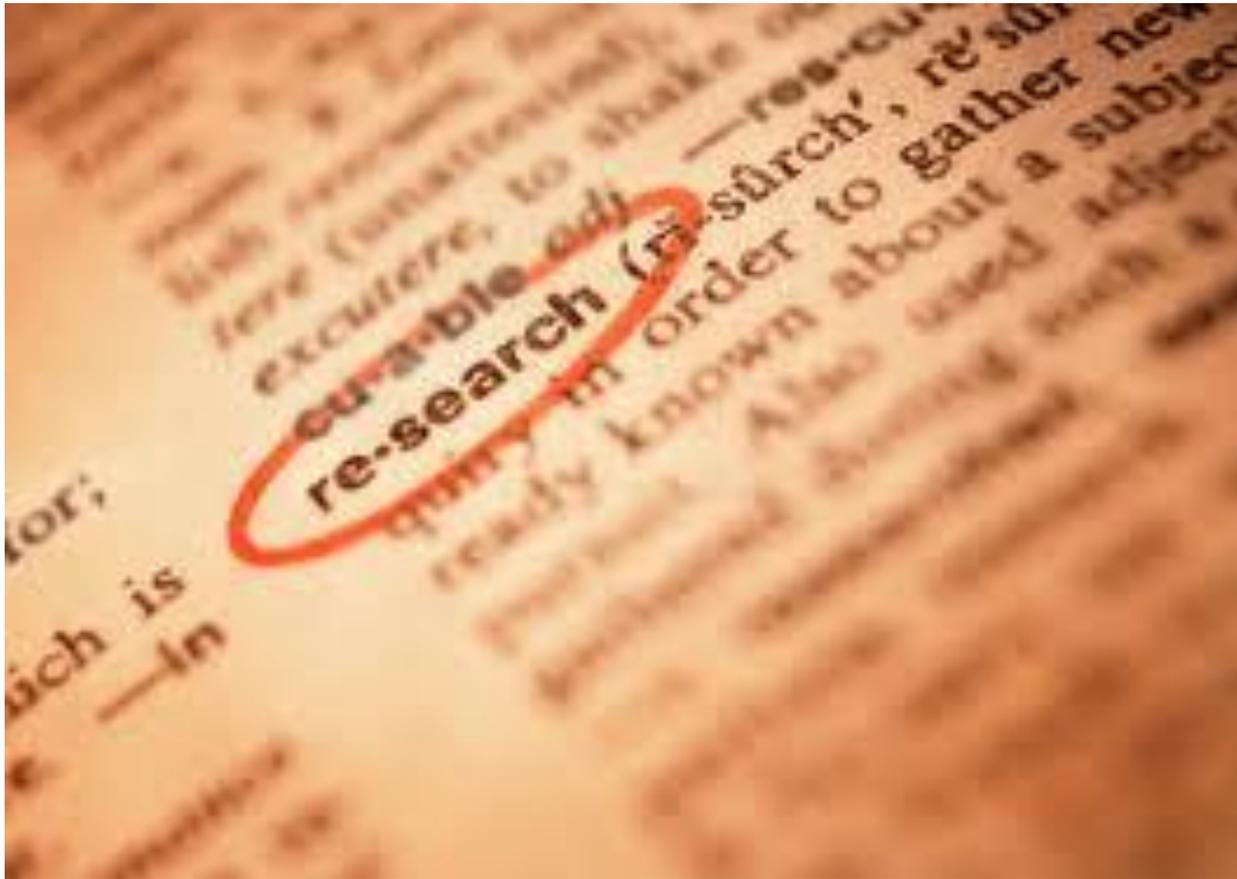
A-B-C Metrics Consistent with These Generally Used Indicators

Socio-economic Outcomes

- ❁ Jobs created or retained
- ❁ Private investment leveraged
- ❁ Tax revenues generated
- ❁ Newer indicators
 - Net environmental impacts
 - Benefits to LMI citizens
 - Benefits to distressed communities

Program Impacts

- ❁ Research and development performance (e.g., Federal funding)
- ❁ Knowledge creation (e.g., patents)
- ❁ Technology transfer
- ❁ Access to capital, including federal programs such as SBIR
- ❁ Entrepreneurship, company formation and growth
- ❁ Jobs in targeted sectors



PART II: CHOOSING A METHOD

Evaluation Methods – Pros and Cons

Quantitative

- ❁ Survey
- ❁ Econometric and statistical analysis
- ❁ Bibliometrics

Qualitative

- ❁ Case studies
- ❁ Social network analysis
- ❁ Expert judgment

Related Methods

Economic Impact Analysis

Use Input-Output models to calculate direct, indirect and induced impacts

(e.g. SRI Report)

Cluster Analysis

Use economic data to describe networks of companies and resources in a geographic area

(e.g. Battelle Report)

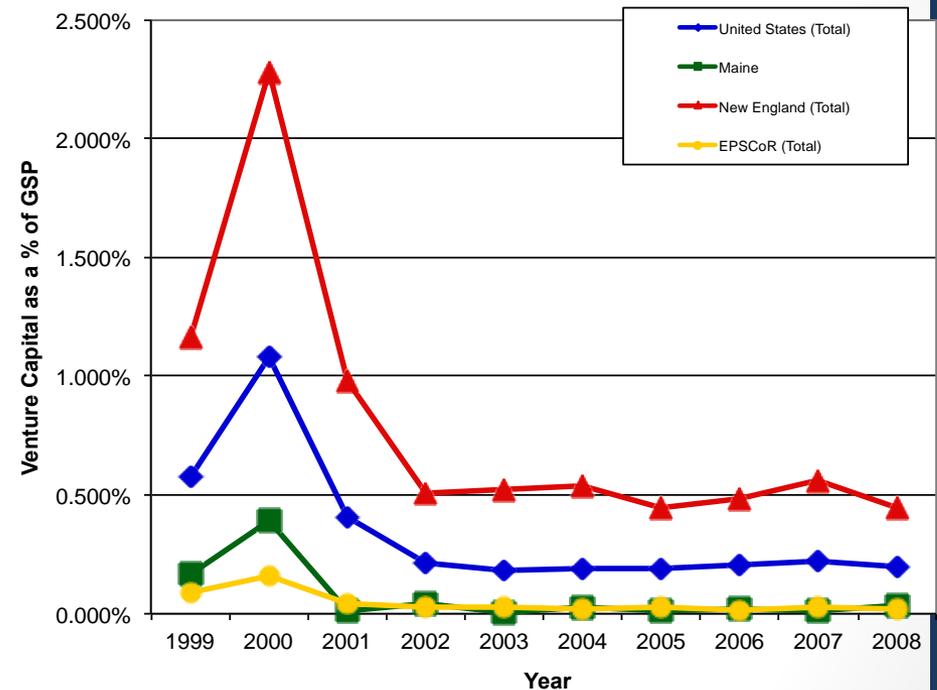
Benchmarking

Look at national data to compare one state/region/city to others

Benchmarking – Innovation Index

- ❁ Compares across places
- ❁ Describes overall socioeconomic conditions, not tied to specific programs
- ❁ Provides exploratory info to identify problems or successes
- ❁ Provides actionable info about resource gaps that might address problems
- ❁ Uses independent statistics

Venture Capital Invested as a Percent of Gross State Product – 1999-2008



Return on Investment (ROI)

- ❁ Is there a single measure for economic development investments that can be used to compare various alternatives comparable to business ROI?
- ❁ Challenge is that different programs have different objectives, even within TBED
- ❁ Cost-benefit analysis was developed to compare public investments with differing objectives
 - ❁ Monetize costs and benefits (all types)
 - ❁ Economic impact analysis used to monetize economic benefits
 - ❁ Compare– usually done as 10:1 type result where 10 is benefit and 1 is cost

Who Should Perform Evaluation?

- ❁ In-house?
- ❁ Recipients report their results?
- ❁ External, third-party evaluation?

❁ Issues

- ✓ Time
- ✓ Expertise
- ✓ Expense
- ✓ Confidentiality
- ✓ Confidence and credibility
- ✓ Doublecounting

Third Frontier Performance Reports

SRI Report

- ❁ Credible analysis and result
- ❁ Strengths-comprehensive
- ❁ Weaknesses-opaque
- ❁ Other states rarely go this deep.

Battelle Report

- ❁ Well done cluster report
- ❁ Not really an evaluation as much as research to inform planning
- ❁ Comparable to other cluster reports



PART III: CAUSALITY

To Prove Causality, You Need Four Conditions

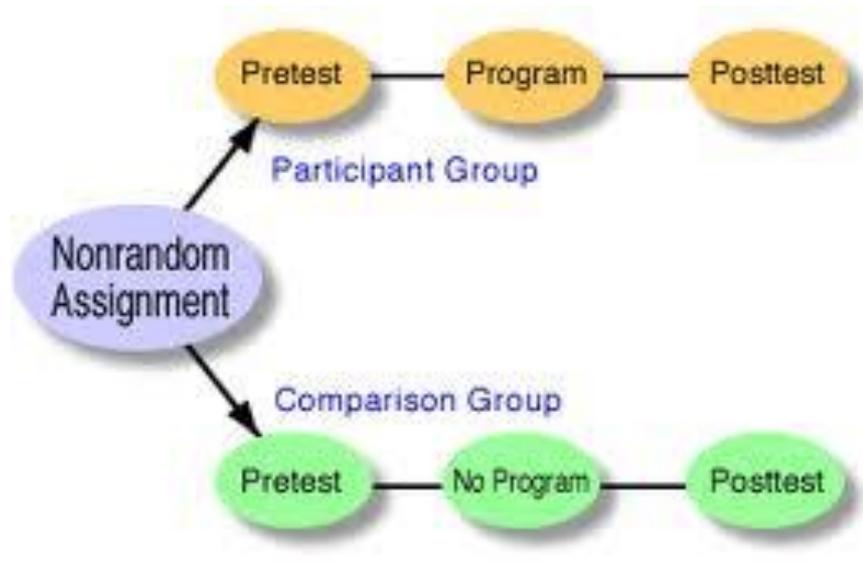
1. That the outcomes exist
2. That the inputs precede the outcomes
3. That the inputs, outputs and outcomes are related
4. That all other explanations are accounted for.

This generally requires random assignment of subjects to treatment group and non-treatment group – very difficult in economic development situations

Recipients are not random, nor are they equal when competition is used for selection.

Quasi-experimental Alternatives

1. Before and after
 - a. Test after
 - b. Test before and after
2. Start, then stop, then start intervention
3. Matching



Attribution is Weaker, but Easier to Prove.

- × The outcomes exist
- × The inputs precede the outcomes
- × The inputs, outputs and outcomes are related
- × Clients say (attribute) their results to the program



Recommendations

- ❁ Evaluation is a process, not an event. Keep asking questions.
- ❁ Best strategy is a mix of various methods, including
 - ✓ Benchmarking for context
 - ✓ Independent surveys for credible data;
 - Ask clients and end users about comparable value of assistance received
 - ✓ Economic impact analysis of data for cost-benefit measure
 - ✓ Case studies for deep dives
- ❁ Wish list
 - ✓ Detailed econometric analysis of all economic development investments over past 10-20 years to tease out most effective interventions

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Ohio Third Frontier Program Area Priorities

FY 2012 Strategy Review

Ohio Third Frontier Future Direction (2011+)

- Faster ROI
- Key Industries
- Game-Changing Investments
- Away From Grants
- Better Metrics

Battelle

The Business of Innovation



FY 2012 Strategy Review

OTF Outcomes

- Jobs, Growth, Wealth
- Companies, Talent, Capital
- Sustainable Activity
- Reduced Risk
- Best Practices
- Reputation



FY 2012 Strategy Review

Current Technology Focus Areas*

- Advanced Materials
- Aeropropulsion Power Management
- Fuel Cells & Energy Storage
- Solar Photovoltaics
- Medical Technology
- Software Applications for Business & Healthcare
- Sensing and Automation Technologies
- Situational Awareness and Surveillance Systems



FY 2012 Metrics Review

Performance Metrics

- Tracked for all active grants
- Six-month reporting in standard format
- Dashboard presentation by program
- Funds & Cost Share
- Leverage (Dollars & Ratio)
- Jobs (Direct & Indirect)
- Companies



OTF Funding Overview

Single Source
Third Frontier R&D Fund
(voter-approved bonds)

FY 12	FY 13	FY 14	FY 15
\$225 M	\$175 M	\$175 M	\$175 M

FY12 carryover expected to be \$61 M

Funds available in FY 2013 = \$236 M

FY 2012 Budget Review

1. Entrepreneurial Support

\$77.7 M - 42% of total budget

- Entrepreneurial Signature Program
- Pre-seed Fund Capitalization
- Micro Fund *New*
- Growth Fund *New*
- ONE Fund

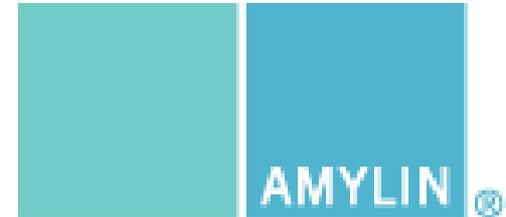
AssureRx
Right Drug. Right Dose. Right Now.

ohio
TechAngels

FY 2012 Budget Review

2. Value Chain Development

\$39.9 M - 21% of budget



- JobsOhio Network
- Commercial Acceleration Loan Fund *New*
- Targeted Industry Attraction



FY 2012 Budget Review

3. Open Innovation

\$65 M* - 35% of budget

PHILIPS
Medical Systems

- Tech Validation & Start-Up Fund *New*
- Open Innovation Incentive *New*
- Innovation Platform Program
- Industrial R&D Center Program
- Research Incentive

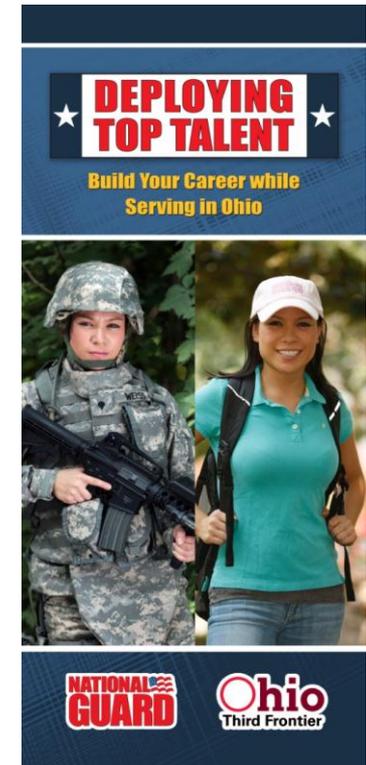


FY 2012 Budget Review

4. Talent

\$3 M - 1% of budget

- Third Frontier Internship Program



FY 2012 Remaining Programs

PROGRAM	FY 2012 Budget (in millions of \$)	RFP Opened (in millions of \$)	AWARDS (in millions of \$)	BALANCE (in millions of \$)
Tech Validation & Start-Up Fund (multiple rounds)	6.0	6.0	Aug '12 1.8	4.2
Growth Fund	10.0	Sep '12	0.0	10.0
Commercial Acceleration Loan Fund	25.0	Nov'12	0.0	25.0
Entrepreneurial Signature Program	40.0	40.0	Oct '12	40.0
Pre-Seed Fund Capitalization	25.0	25.0	Nov '12	25.0
Micro Seed Funds Initiative	1.0	0.0	Cancel	1.0