Innovation through Cooperation with Small High Technology Firms

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(short presentation)
Main issue

How do we enhance the commercialization potential and product activity from advanced patented technology, particularly that funded by NSF to small businesses (SBIR’s), Universities (Research) etc. How do we sustain value, and how to we enhance growth.
Small businesses - a US high growth sector
Universities are large businesses - not a high growth sector

- SB’s push the economy forward in fact even "micro-businesses" that have annual revenues under $1 million—represent as much as 15 percent of the U.S. economy
- SB’s make up 99.7 percent of all U.S. employers, meaning that only 17,000 companies, or 0.3 percent of all employers, have 500 or more employees
- SB’s comprise 97 percent of exporters and 29 percent of all export value—key points when we consider that exports have accounted for about 25 percent of U.S. economic growth over the past decade and support an estimated 12 million jobs
- small businesses produce 13 to 14 times more patents per employee than do large firms; much more cited. Employ large number of advanced degrees.
- by deploying flexible production techniques enabled by new technologies and newly efficient business practices, small businesses can adapt faster to shifting economic conditions;

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http://usinfo.state.gov/journals/it es/0106/ijeel eebackert.htm
Invention and Innovation. Definition
Not all inventions lead to Innovation.

- **Invention** – *(Technology and Intelligence - IP issues predominate)*.
- High notion of value. Small teams or individuals.
- Eureka Moments, Discoveries, Unanticipated directions
  - 1um to 100nm to 10nm *(Nano technologies)* Increased Properties
    Some Inventions can be highly novel and potentially disruptive
    The airplane, nano technologies but also Aluminum

- **Innovation** – *(Market Place Effectiveness - Cost and Profit is predominate)*. Notion of value tempered by notion of cost.
  - Most often large number production (larger teams)
  - Plus Reduced Defects
  - Plus Improved Properties, Continuous Improvement.
  - Plus better ROI against competing ventures

Some are seemingly stupid Inventions;
- A wind powered fan.
- A hydrogen fuel-cell to make hydrogen electrolytically.
- A high density aluminum alloy.

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Innovation has to do making more of something……

Yeramalli and Sekhar Resources Policy 2006

Invention Driven activity

Valley of Death

Innovation Driven Activity

TIME

ACTIVITY
A few pointers from experience

• Invention activity is normally long cycle. Universities typically should make fundamental inventions!
• Firms innovate and make product inventions- need to have been active for a few years with products in order to successfully reap the benefits of the invention.
Geographically concentrated networks and value chains of suppliers and/or knowledge instituted with the aim of fostering innovations. (Hospers and Beugelsdikj, 2002)
• University and High Tech Firms can overcome the valley of death. Cluster approach is viable... case studies...

• What are the potential pitfalls----several e. g. pure SBIR firms can emerge, University IP departments could inadvertently scuttle entrepreneurship, and most damaging can be a dilution of a universities mission.....
Advantages of Clusters

Participation in a cluster allows small firms to operate more productively. They have better access to means needed for carrying out their activities, such as technology, information, inputs, customers, and channels, than they would have when operating in isolation. Universities also will have a ready method for commercialization through innovation clusters. It’s a win-win.
Take away

- Small firms are exciting….carry a large part of the economy. Constantly innovate.
- Universities are involved with fundamental inventions – not specific product inventions.
- There is a natural fit………may overcome valley of death for several inventions

- Innovation cluster creation may dramatically aid activity leading to stronger economic growth ---- NSF encouraged collaboration with and amongst high tech firms and universities definitely should be a part of this cluster development as it can bridge inventions and innovations.