Rising to the Challenge

U.S. Innovation Policy for the Global Economy

Making America Competitive Again:
Restoring U.S. Innovation Leadership
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The Innovation Challenge

Innovation is the currency of global competition and national strength in the 21st Century

Other Countries are taking up this Challenge

- They are Providing Five Key Areas of Support:
  - High-level Policy Focus on Growth and Strength
  - Sustained Support for Universities
  - Rapidly Growing Funding for Research
  - Support for Innovative Small Businesses
  - Government-Industry Partnerships to bring new products and services to market
- They are investing very substantial resources to create, attract and retain the industries of today and tomorrow.

China's Goal: To Become an "Innovation-Driven Economy" by 2020

- Boosting R&D Investments
  - Expenditure on basic research doubled between 2004 and 2008
  - Tax incentives for enterprises that invest in R&D
- Building first-world R&D Infrastructure and Facilities
- Developing World Class Universities
  - Investing in Higher Education at Record Levels
- Building Innovation Clusters though the development of large S&T Parks
- Acquiring technologies and talent from abroad

Source: Mu Rongpin, 2010 UNESCO Science Report

Its not just Size but Focus!
Singapore's Innovation Strategy

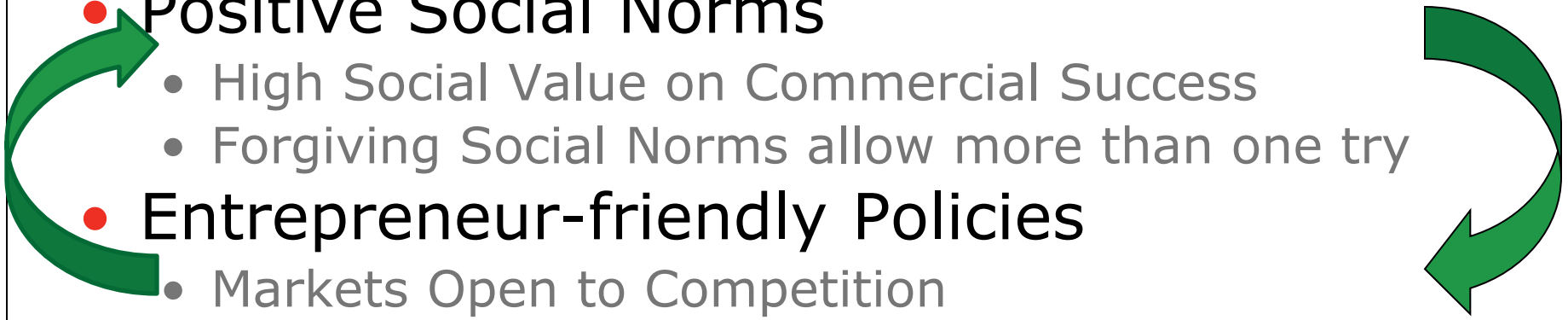
- Singapore (population: 4.5 million) goal is to be Asia's preeminent financial and high-tech hub.
- Government investing $12.8 billion under the Research, Innovation and Enterprise 2015 plan
- A*STAR's task, with $5 Billion in funding, is to:
  - Attract a skilled R&D workforce
  - Draw major investments in pharmaceuticals and medical technology production
  - Invest in S&T Parks: Biopolis & Fusionopolis
  - Focus on funding for Early-Stage firms (SBIR)

Innovation in the United States

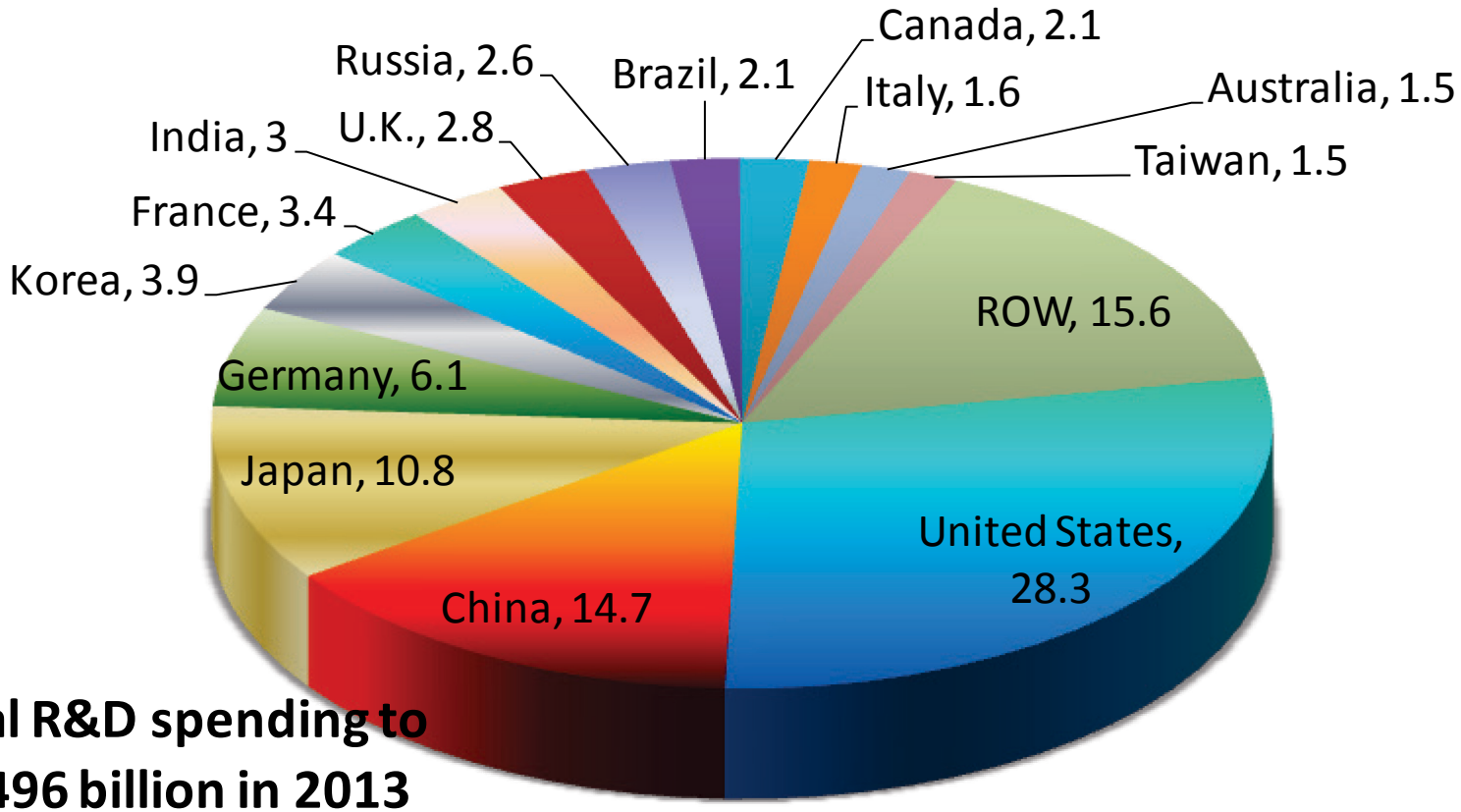
Strengths and Challenges

U.S. Framework Conditions favor Innovation and Entrepreneurship

- Openness to science and innovation
  - Trust in Science & Scientific Institutions
- Positive Social Norms
  - High Social Value on Commercial Success
  - Forgiving Social Norms allow more than one try
- Entrepreneur-friendly Policies
  - Markets Open to Competition
  - Gentle Bankruptcy Laws permit rapid recovery
  - Taxes give Prospect of Substantial Rewards
- Revised Intellectual Property Regime:
  - Encourages Research & Diffusion of Research Results



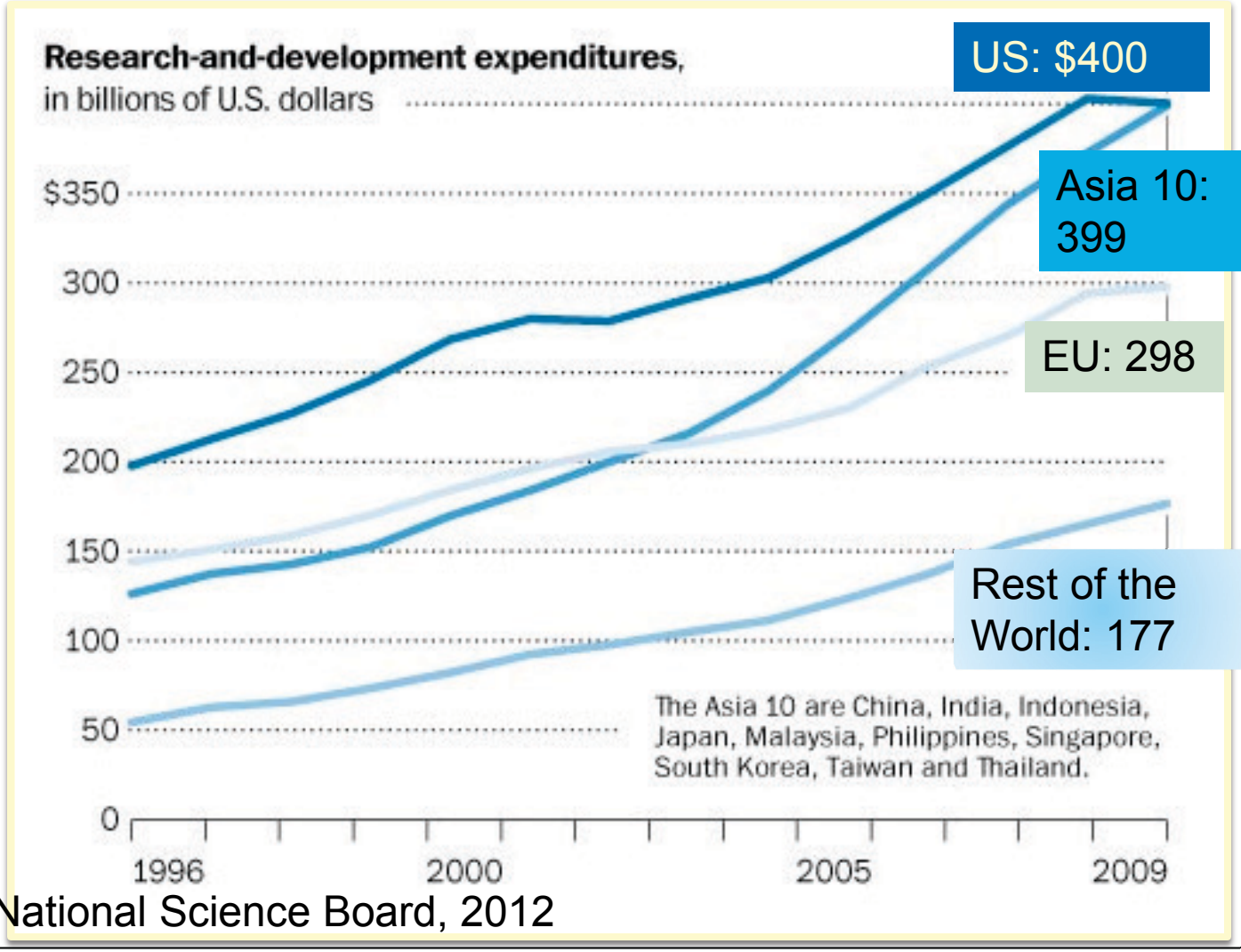
Good News: The U.S. has a Large Share of Global R&D



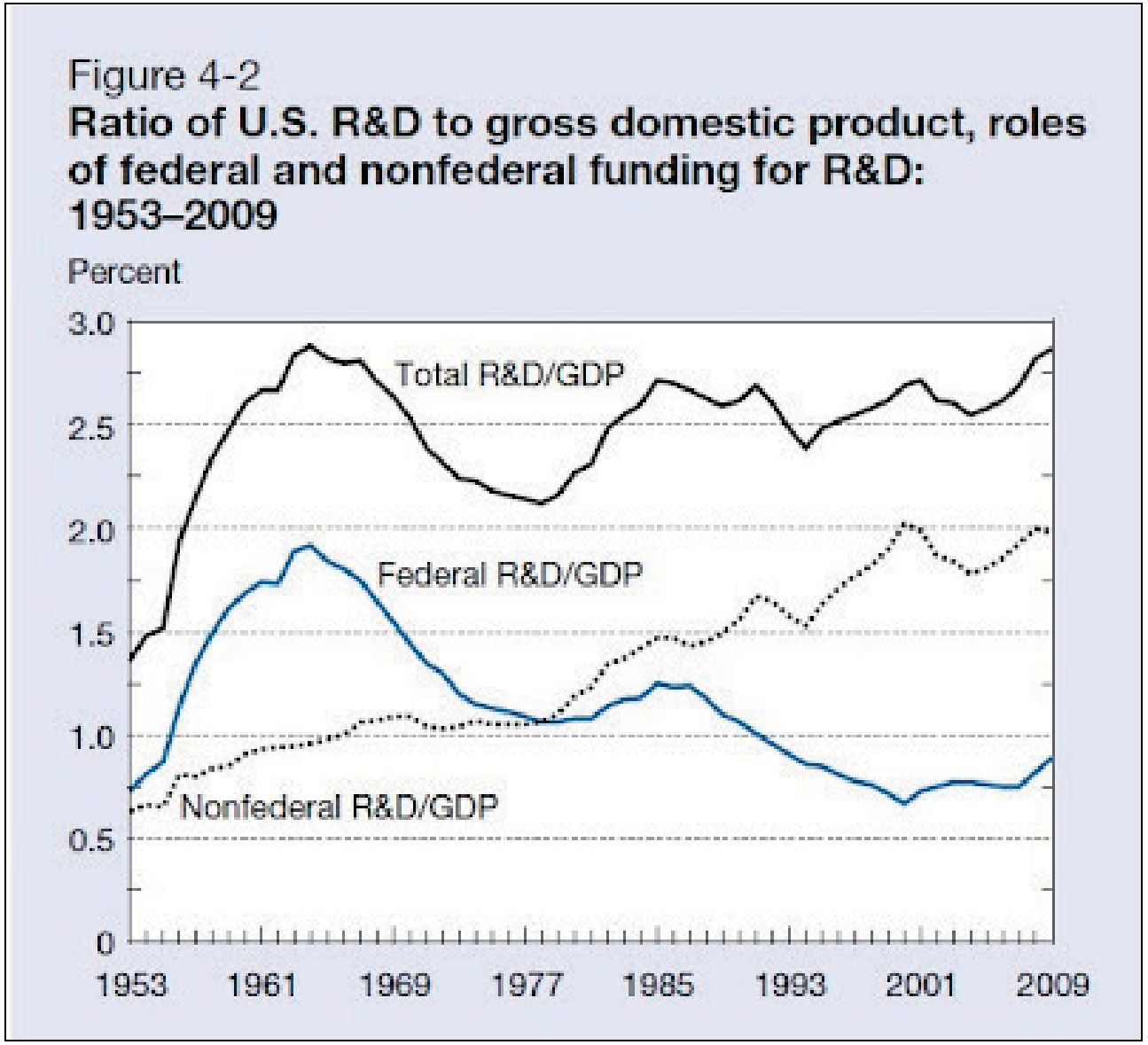
Total global R&D spending to reach $1,496 billion in 2013

SOURCE: Battelle and R&D Magazine, *2013 Global R&D Funding Forecast* (December 2012).

Asia's R&D Surge



Source: National Science Board, 2012



Federal R&D Spending: A Declining Share of GDP

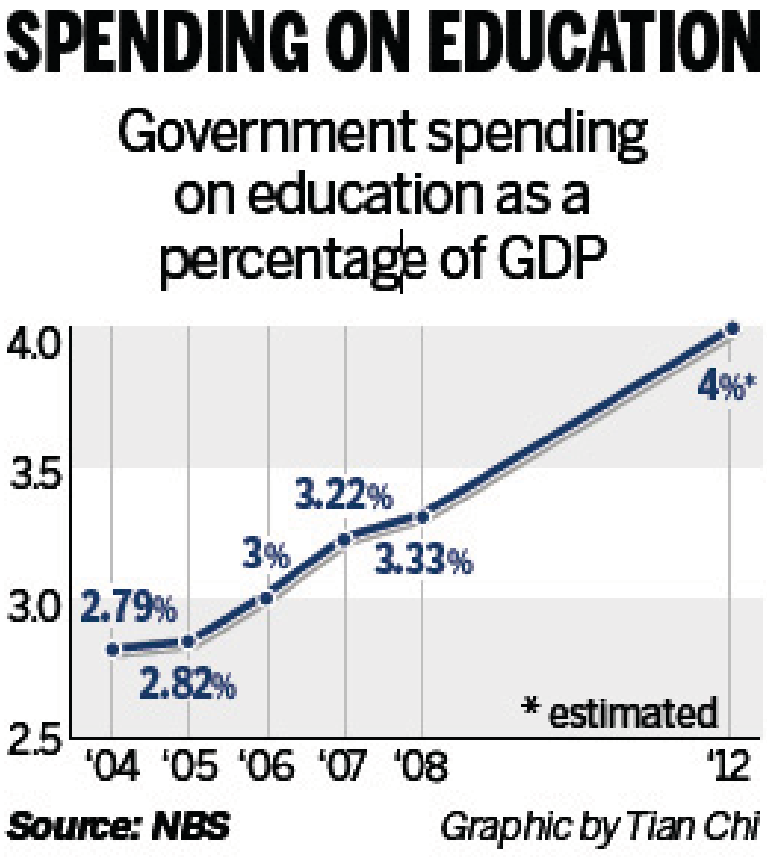
Source: NSF S&E Indicators 2012

Falling Support for U.S. Universities: Less Funding and More Regulations

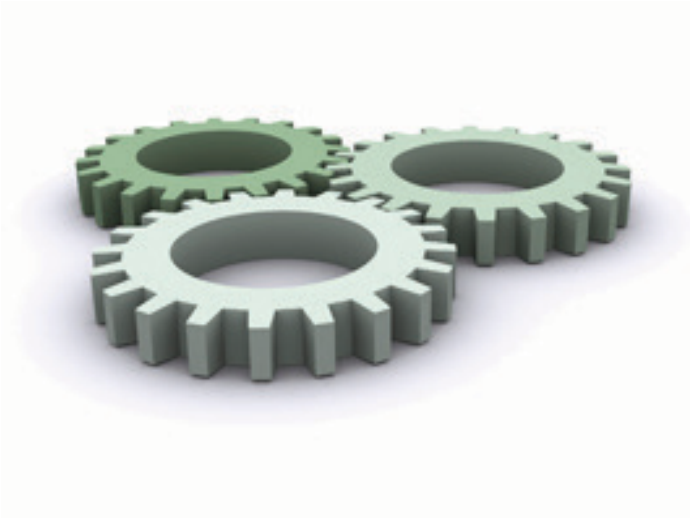
- Per-student funding for major public research universities has dropped by 20 percent during the past decade (NSB,2012)
- At the same time, U.S. Research Universities face a growing regulatory burden.
  - Source: NRC, *Research Universities and the Future of America: Ten Breakthrough Actions Vital to Our Nation's Prosperity and Security,*2012.
- These developments are undercutting a principal pillar of the U.S. innovation system.

China's Investments in Education

- 5-fold increase in doctoral degrees between 1995 and 2005
- Number of Chinese universities in the Global Top 500 increases to 35 in 2011
- Long surge in university enrollment but this is now ending due to changing demographics



The Global Competition for Manufacturing

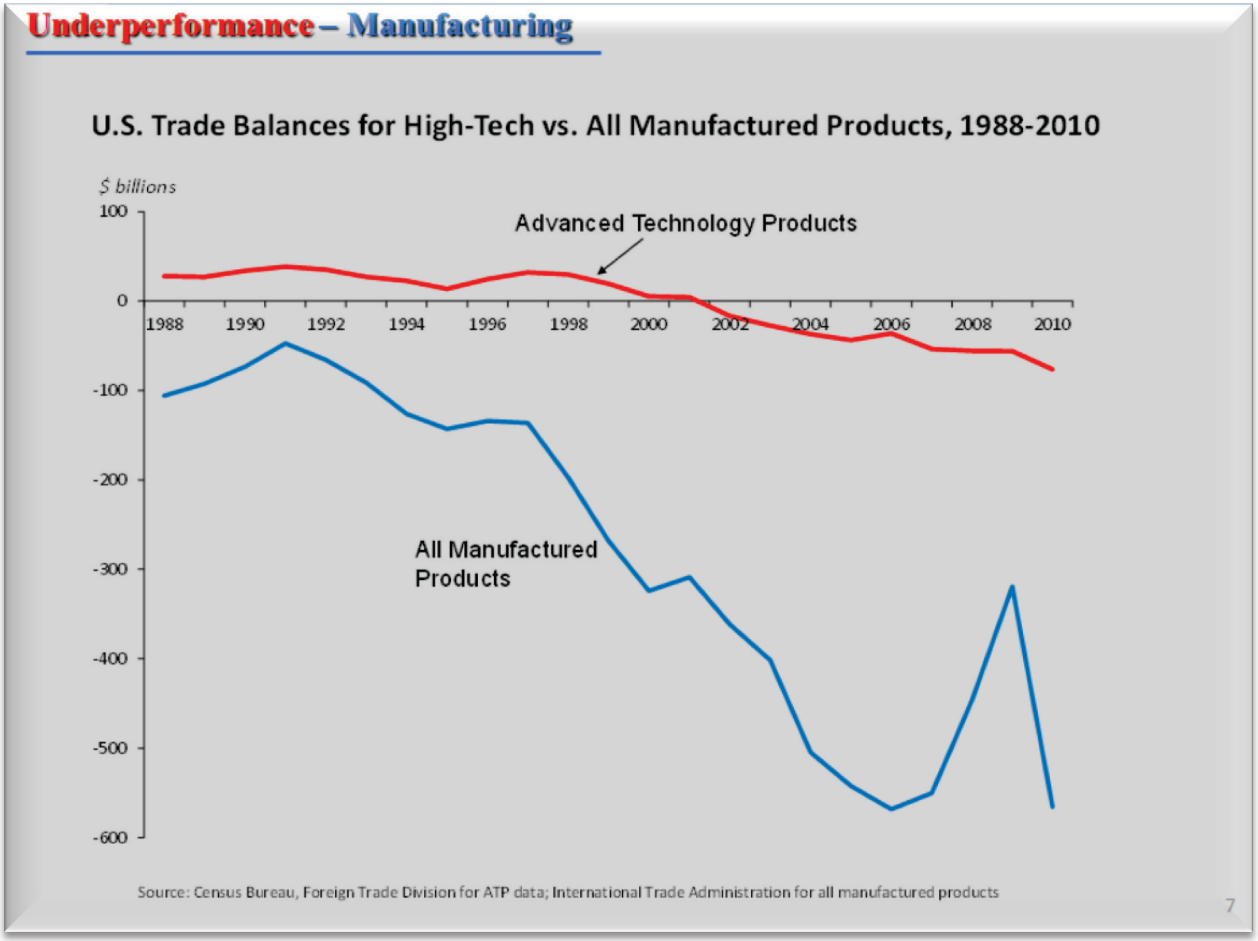


Why does Manufacturing Matter?

- An important Source of Employment
  - Manufacturing supports an estimated 18.6 million jobs in the U.S.—about one in six private sector jobs
- Manufacturing dominates the U.S. Innovation System
  - 70% of industrial R&D, 80% of patents, employs 64% of scientists and engineers
- An essential element in U.S. National Security: Having on-shore production capacity matters

Source: National Association of Manufacturers, 2009

Declines in U.S. Trade Balance for Advanced Technology Products



Erosion of America's high-tech manufacturing base can undermine U.S. leadership in next-generation technologies.

A Paradigm Shift

Rapid Growth of Skills, R&D, and Manufacturing Capacity Abroad means that

Innovation in the U.S. no longer automatically translates into Production in the U.S.

The U.S. needs to be an Attractive Location for R&D and Manufacturing

- The Results of Research are Mobile: They can be—and are being—exploited around the world.
- Attracting Private R&D: Governments around the world are employing a host of measures to attract Corporate R&D Centers.
- Securing Production: Many governments have active programs to attract and retain manufacturing, and the jobs, growth, and security they bring.
  - Tax and Regulatory Policy Matters

How must we Respond to the Innovation Challenge?

The National Academies Report,

"Rising to the Challenge" provides recommendations for moving forward

Reinforce the Pillars of US Innovation

- Grow R&D Funding
  - Follow through on commitment to a 3 percent target for R&D Investment as a share of GDP.
- Sustain Support for University Research
  - Provide support for basic and applied research.
- Support Innovative Small Businesses
- Strengthen the Skilled Workforce
  - Community College & Partnerships need more attention
- Build a Good Investment Environment
  - Taxes and Regulations that make competitive sense

We need more Support for Manufacturing

- Germany spends $2.5 Billion a year on the Fraunhofer System of Applied Research
  - 60 Centers and 18,000 staff for 80M Germans
- We need to capture greater value from public investments in research by:
  - Strengthening university links to industry
  - Creating or expanding programs that directly support manufacturing in emerging technologies such as flexible electronics and additive manufacturing

Monitor and Learn from what the Rest of the World is Doing

- Actively counter mercantilist trade policies
- Benchmark best practices in support of manufacturing and adopt and adapt new programs and practices
- Engage and cooperate abroad
- Respond at home with sustained investment and policy focus

In Sum: 4 Core Goals for U.S. Innovation Policy

- ✓ Reinforce U.S. innovation leadership with more R&D and greater support for Universities and partnerships.
- ✓ Capture the benefits of investments in research through more support for manufacturing.
- ✓ Monitor and learn from what the rest of the world is doing.
- ✓ Cooperate more actively with other nations on mutually beneficial areas.

What are the Stakes?

- Faster Growth and Greater Prosperity for our children and grandchildren
- Our continued leadership in science, technology, and innovation is the foundation of our national security .

Thank You

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