

Federal R&D Funding and Innovation Policy

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January 2008

for the Driving Entrepreneurial Growth symposium

AAAS R&D Budget and Policy Program

<http://www.aaas.org/spp/rd>

See the “What’s New” section for the latest updates; see the “Seminars and Presentations” section for copies of this presentation.



INNOVATION (1)

- There is a growing consensus among policymakers and scientists that science and technology–based innovation is a key strength of the U.S. economy, but also growing concern that the U.S. lead could be endangered in the future. Therefore, major policy efforts to encourage government R&D funding, better science and math education, more students pursuing S&E careers, and better innovation policies are needed.
- In response, President Bush announced the American Competitiveness Initiative (ACI) in 2006. In August 2007 the America COMPETES Act authorizing several new initiatives to boost math and science education, U.S. science and engineering careers, and innovative R&D programs became law.
- But funding to implement the new law fell far short of targets for 2008.

INNOVATION (2)

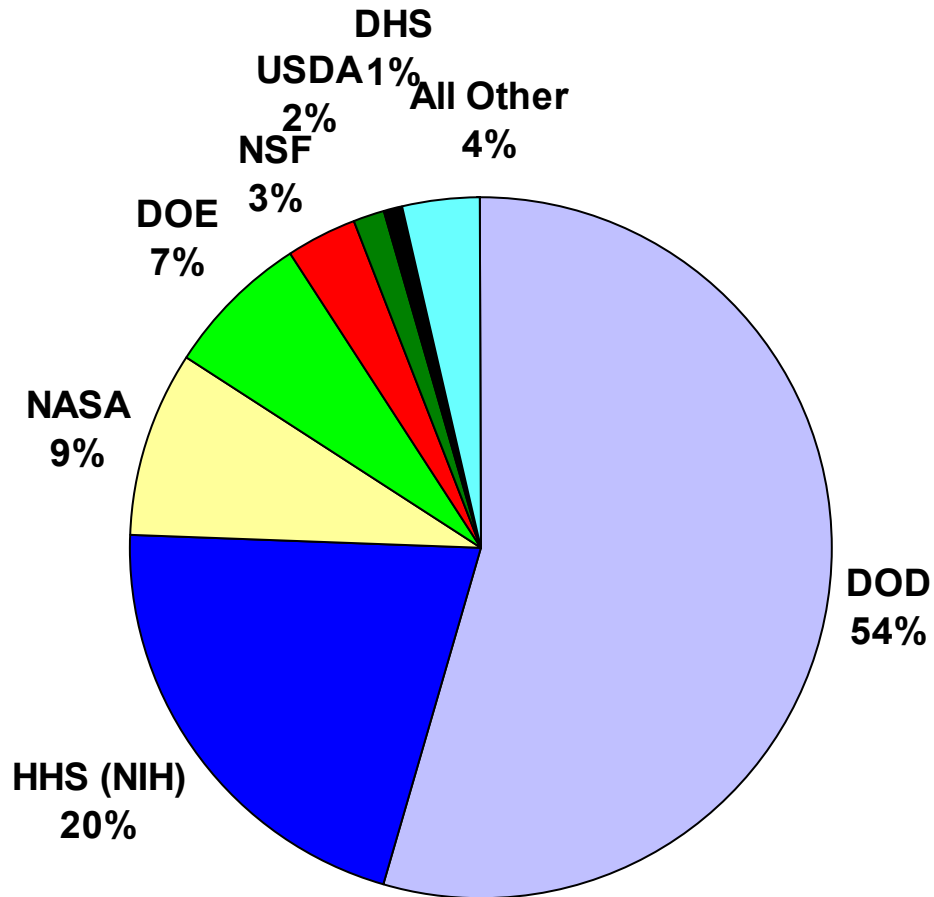
- The current policy focus is on increasing U.S. government funding for three physical sciences agencies: NSF, DOE Office of Science, and the NIST laboratories.
- These agencies fund basic research in physics, computer sciences, materials, engineering, mathematics, chemistry, nanotechnology, and other related disciplines that could be useful to future U.S. economic growth. They do not target specific technologies or markets.
- The plan is to double funding for these R&D agencies over the next 7-10 years, but the plan is badly off course in 2008.
- Other parts of the innovation agenda, such as immigration reform or making the R&E tax credit permanent, are unlikely to be considered.

THE FEDERAL BUDGET IN FY 2008

- The U.S. government spends more than \$140 billion a year on R&D. More than half goes to the military, and the remainder goes to R&D for other national missions (health, energy, etc.)
- States have a small funding role (<\$5 billion?), but they have important roles in supporting public universities, funding commercially-oriented R&D in niche areas the federal government would not fund, and providing many services to assist in commercializing R&D.

Total R&D by Agency: FY 2008 Final *

Budget Authority in billions of dollars

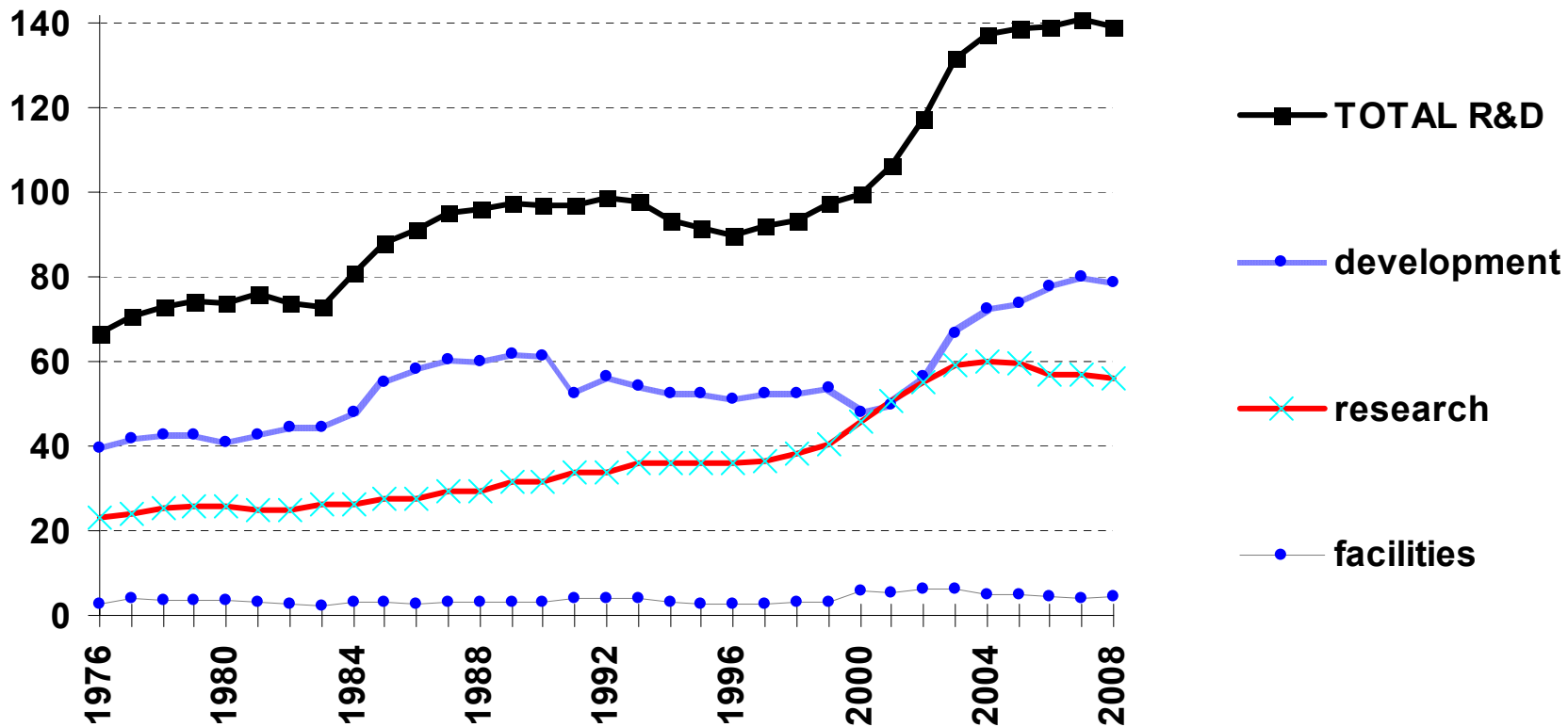


Total R&D =
\$142.7 billion

* AAAS estimates of R&D based on FY 2008 appropriations bills.
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Trends in Federal R&D, FY 1976-2008 (Conference) *

in billions of constant FY 2007 dollars



Source: AAAS analyses of R&D in annual AAAS R&D reports.

* FY 2008 figures are latest AAAS estimates of FY 2008 appropriations.

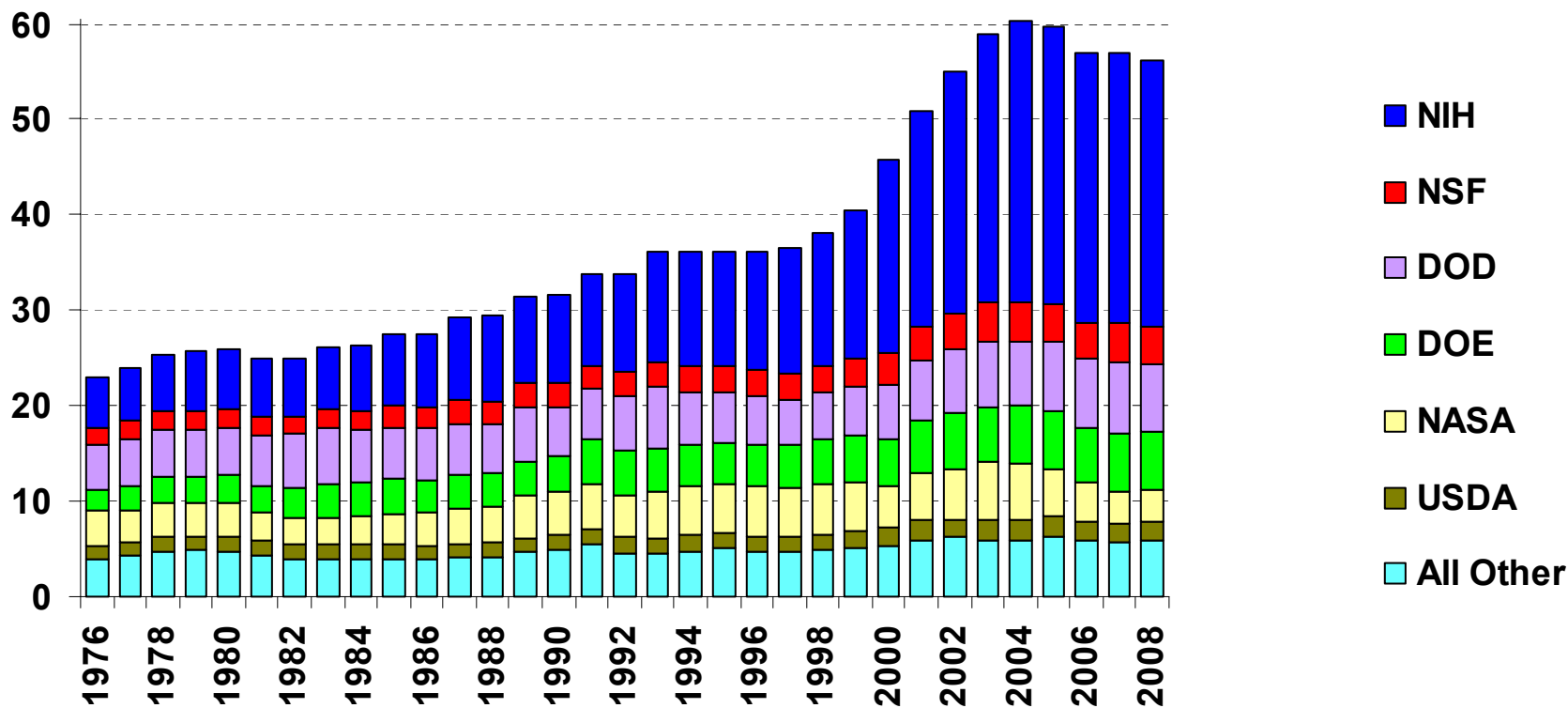
R&D includes conduct of R&D and R&D facilities. Data to 1984 are obligations from the NSF Federal Funds survey. Constant-dollar conversions use GDP deflators from OMB.

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Trends in Research by Agency, FY 1976-2008 (Conference)*

in billions of constant FY 2007 dollars



Source: AAAS analyses of R&D in annual AAAS R&D reports.

* FY 2008 figures are latest AAAS estimates of FY 2008 appropriations.

Research includes basic research and applied research. 1976-1994 figures are NSF data on obligations in the Federal Funds survey.

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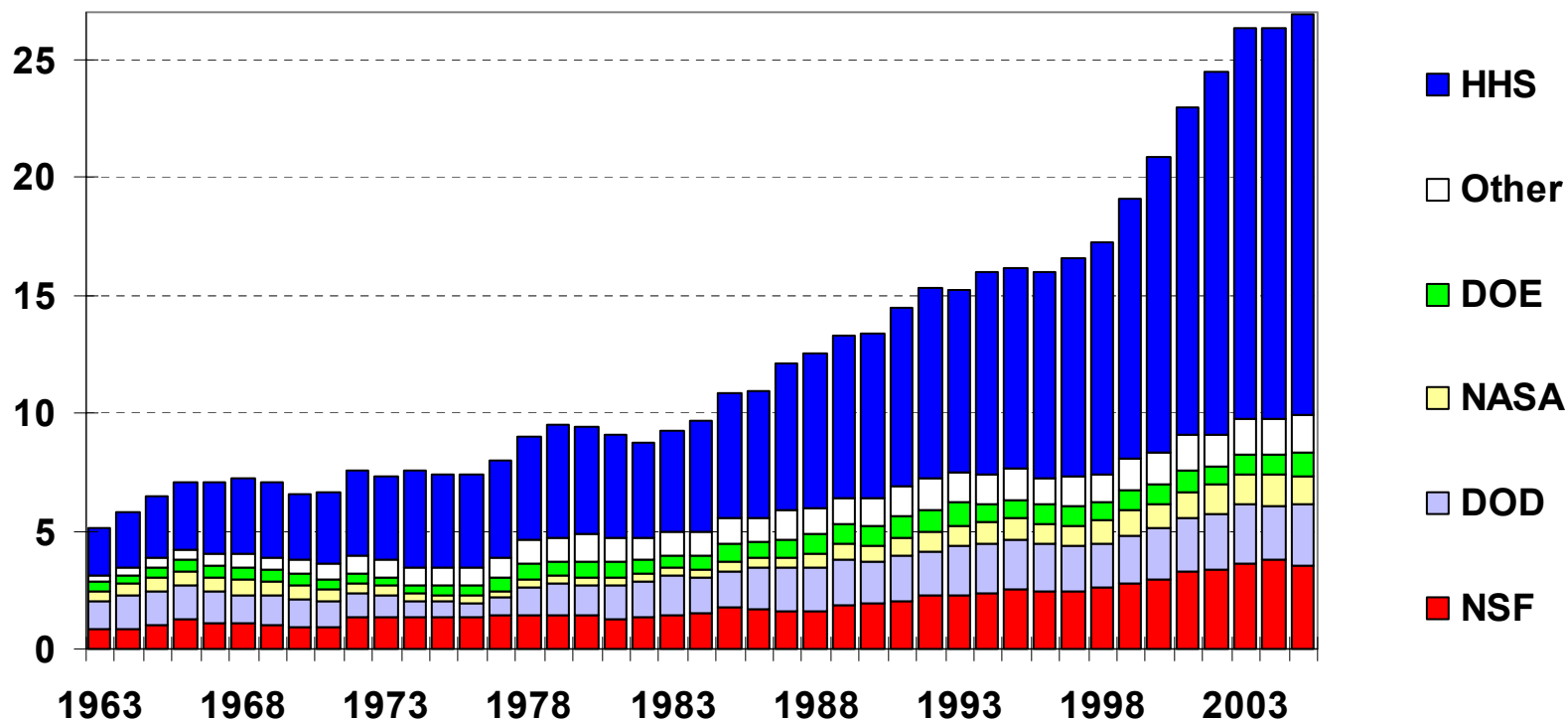


INNOVATION AND FEDERAL R&D

- The majority of federal basic and applied research funding is performed in U.S. universities. Several laws encourage universities to commercialize research findings (Bayh-Dole Act).
- There is \$2 billion + in R&D funding specifically dedicated to R&D in small businesses (the SBIR program).
- There are small government programs to encourage companies to commercialize promising technologies (MEP, TIP).
- Federal R&D investments in many areas (energy, homeland security, biomedical research) are oriented to developing new private-sector technologies to meet national needs.
- The enormous scale of federal R&D spending helps to create a large, well-functioning innovative sector in the U.S. economy.

Federal R&D Funding to Colleges and Universities FY 1963-2005

Obligations by agency in billions of constant FY 2007 \$



Source: AAAS, based on NSF, *Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2005, 2007.*

R&D includes research, development, and R&D facilities support. Constant-dollar conversions based on OMB's GDP deflators.

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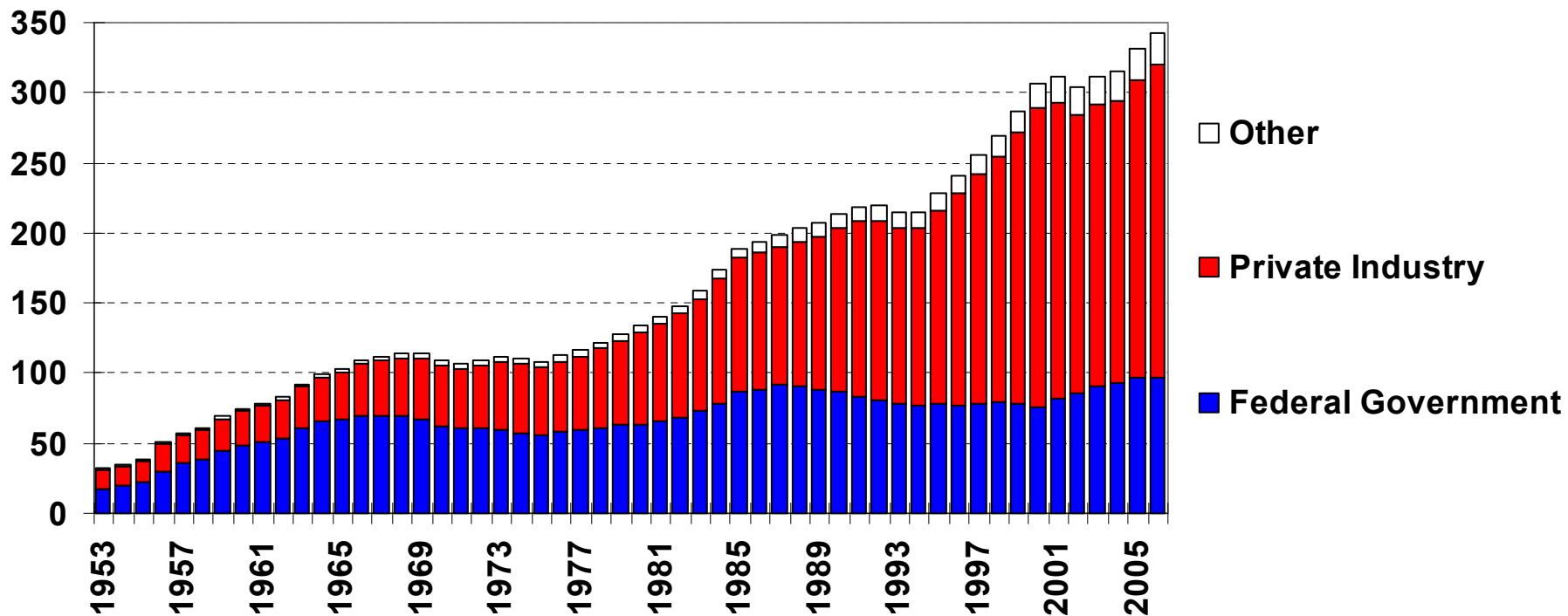


FEDERAL R&D IN CONTEXT: INDUSTRY AND THE WORLD

- 2/3 of all U.S. R&D is funded by industry, but industry focuses heavily on product development; the majority of U.S. research is funded by the federal government.
- The U.S. compares favorably with other nations in R&D spending, but many Asian nations are dramatically increasing their R&D investments.

U.S. R&D Funding by Source, 1953-2006

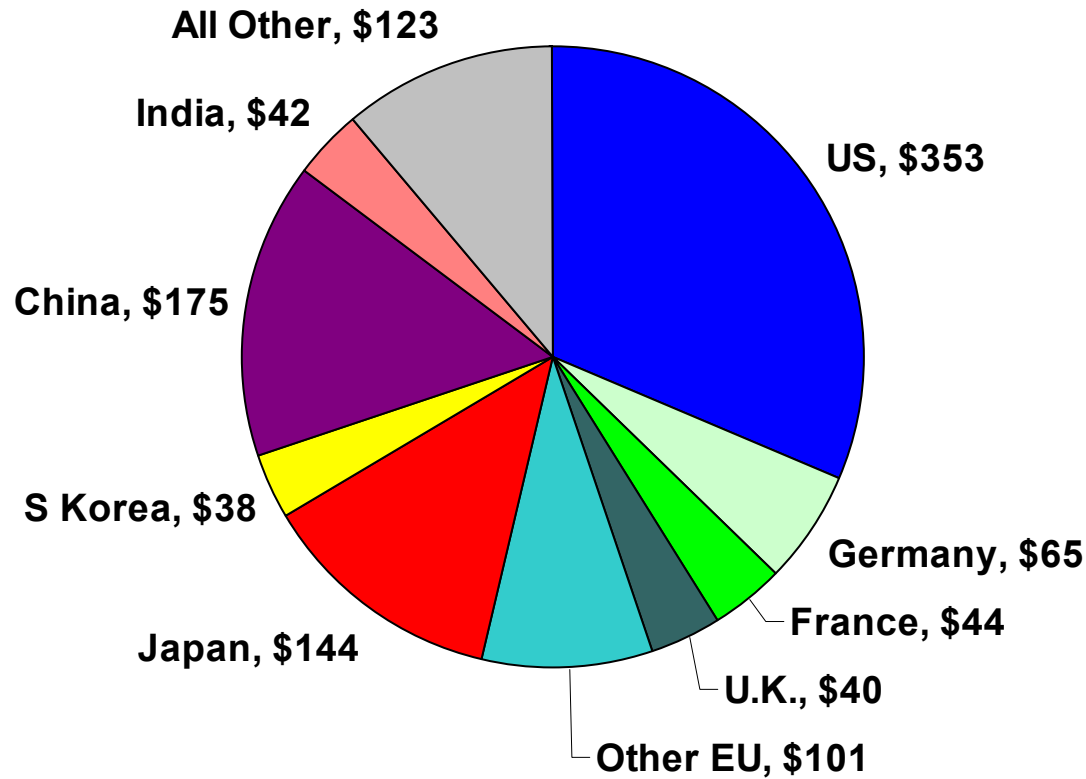
expenditures in billions of constant 2006 dollars



Source: NSF, Division of Science Resources Statistics. (Data for 2005 and 2006 are preliminary.)
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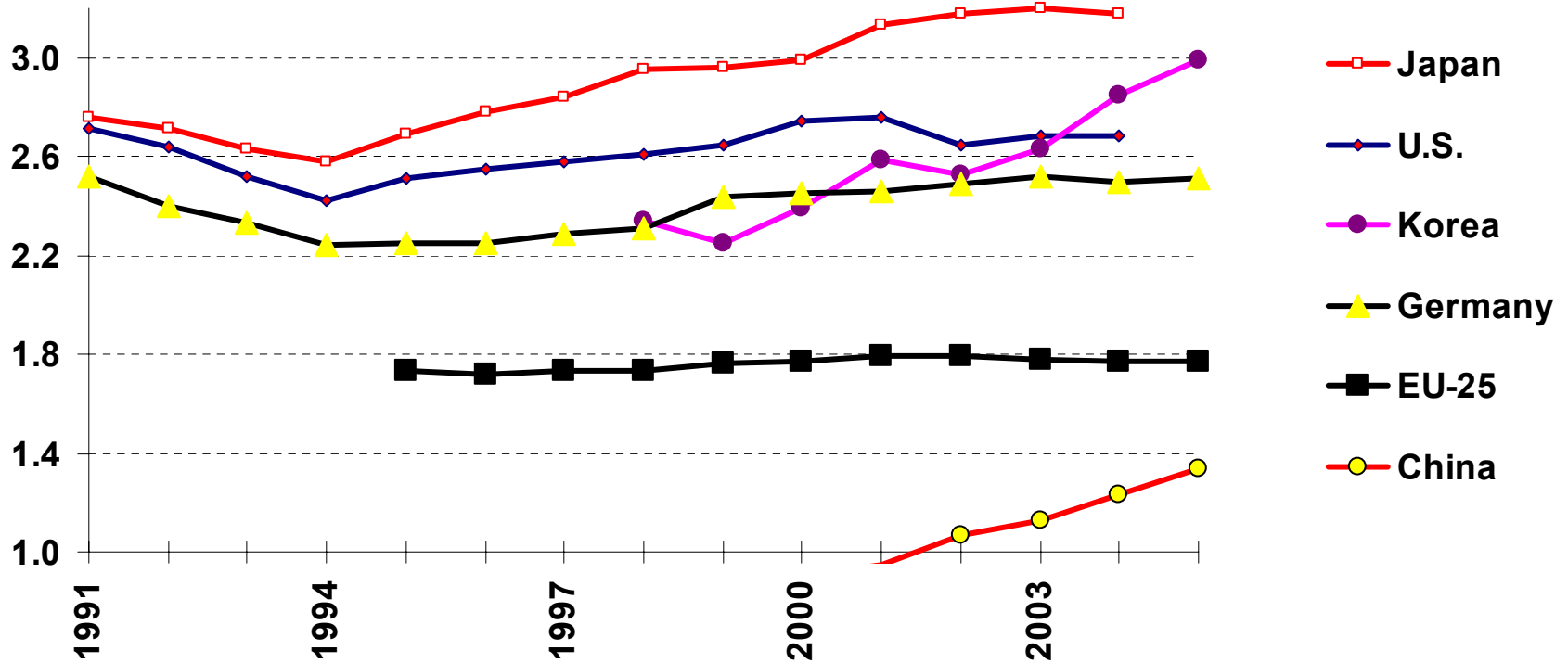
Shares of Total World R&D, 2007



**Total World R&D =
U.S. \$1,124 billion****

Source: Battelle, Global R&D Report, 2007, from Battelle, OECD, and R&D Magazine data. Projections for 2007, by performer nation. * *- calculated using purchasing power parities, in millions of dollars.
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Total National R&D as % of GDP, 1991-2005



Source: National Science Foundation, National Patterns of R&D Resources and OECD, Main Science and Technology Indicators. Data not available for all nations for all years. MAY '07 © 2007 AAAS

WHAT'S NEXT FOR 2008?

- U.S. efforts to boost physical sciences research funding are badly off track.
- Tax incentives for private-sector R&D are temporary, and expire every two years. There is a push to make the R&E tax credit permanent.
- Immigration reform is off the agenda for 2008. Patent reform may happen in 2008, but it's unlikely.
- States are pushing ahead with innovation policies, but there is still great resistance to the federal government becoming involved in sector-specific, private-sector innovation policies.
- In Washington, DC, 'innovation' still means R&D-based technological innovation. There are few policies to encourage process, manufacturing, or marketing innovation.

FOR MORE INFORMATION...

The AAAS R&D web site is
www.aaas.org/spp/rd

AAAS REPORT XXXII

Research & Development FY 2008

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