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Transatlantic Career Options: Trends in U.S. Research Support and Career Opportunities

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U.S. Research & Development (R&D) Funding (1/2)

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The U.S. in International Comparison

- The U.S. still leads in R&D investment worldwide: $368 billion (PPP) or 35% of global total (2007); 2.68% of GDP. Some 2/3 of R&D spending is from industry; 26.7% from the federal government.
- But other countries are increasing their investment:
  - South Korea: $42 billion (PPP), 3.47% of GDP
  - China: $102 billion (PPP), 1.49% of GDP
  - Japan: $148 billion (PPP), 3.44% of GDP
  - Germany: $72 billion (PPP), 2.54% of GDP
  - EU-27: $263 billion (PPP), 1.77% of GDP

The Obama Administration's Priorities

- President Obama has set the goal of 3% of GDP investment in R&D.
- The Obama Administration is committed to boosting federal investment in cutting-edge research, but is shifting priorities to new industries and jobs for a new manufacturing base (economic recovery); clean energy; health at reduced cost and national security (nonproliferation and homeland security).
  - Declines in federal research funding for defense, fossil fuels, and nuclear energy, and in investment in agricultural facilities
  - Research for space travel to shift to private sector
  - More funding for cancer and autism research, science education and workforce development, clean energy.
- Federal R&D funding is spread over some two dozen agencies and departments.
  - Department of Defense: 52.7% of federal R&D funding
  - Department of Health and Human Services: 21.7% of federal R&D funding

U.S. Research & Development (R&D) Funding (2/2)

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Snapshot of Federal R&D Support

- Federal funding remains the single largest source of academic R&D funding ($31.4 billion in 2008) – and supports 70% of postdocs in the United States. The share of federal funding of academic R&D is decreasing (65% in FY2005 to 60% in FY2008). Among FT faculty, junior faculty less likely to receive federal funding than more established scientists
- American Recovery and Reinvestment Act (ARRA) increased federal R&D spending by 12.5% ($18.4 billion) over initial FY2009 funding—but this was a one-time boost. (DoE -- $36.7 billion, NIH--$10.4 billion, NSF--$3.0 billion)
- FY 2010 budget increased federal funding for basic and applied research 0.2% to $50.3 billion.
- Nearly all federal R&D comes from the discretionary budget – which the administration has pledged to freeze for three years.
- Proposed FY 2011 budget would increase funding for basic research 4.4%, for applied research 3.9%. Funding by agency :
  - NIH: $32.2 billion (2.8% increase)
  - Department of Energy (DOE): $11.2; DoE Office of Science R&D budget to increase 3.8% to $4.6 billion
  - National Science Foundation (NSF): $5.5 billion (9.4% increase)
  - Nat'l Inst. of Standards & Technology (NIST): $706 million (21.7% increase)

Impact of the Financial Crisis (1/2)

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- Public universities educate 85% of undergraduates and 70% of graduate students, and perform 62% of federally-funded research. Public institutions employ 64% of faculty, private institutions 36%.
- The recession has hit states and higher education funding hard. 36 states have cut support to public universities and raised tuition. Overall, state funding for higher education has decreased an average of 6% in constant dollars from 2008-2010. Budgetary pressures are unlikely to recede soon, as federal stimulus dollars are spent out.

State	Deficit as % of Budget	2008-10 % Change in State Higher Ed Funding
CA	51%	-19%
CO	21%	-12%
MD	20%	5%
MA	20%	-13%
VA	20%	-10%

Source: Center on Budget and Policy Priorities , www.cbpp.org

- Austerity measures are widespread (Jan. 2009 *Chronicle* survey):
  - 5% of universities have frozen faculty hiring completely, 43% partially.
  - 11% have made layoffs; 26% are considering layoffs.
  - 35% have frozen or delayed salary increases.
  - Mid-year budget cuts and larger classes.

Impact of the financial crisis on academic career opportunities (2/2)

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- "Very high" public research universities (Carnegie classification) are finding it hard to keep pace with private research universities. Effects on public universities:
  - Trouble attracting or retaining the top talent.
  - Lack of start-up funds for laboratory facilities to ensure that faculty are competitive for research grants.
  - Losing tenure-track positions or funding for research centers, esp. in the humanities or social sciences.
  - Faculty positions are less attractive (higher teaching loads, lower pay, fewer top-notch students).

- The budgetary crisis of public universities is reinforcing long-term trends:
  - More Ph.D.'s aspire to academic careers than can be accommodated. The share of recent Ph.D.'s hired into full-time (FT) faculty positions decreased from 74% in 1972 to 45% in 2006.
  - Within academia, a large group of researchers is developing parallel to regular FT tenure-track faculty. From 1993 to 2006, non-tenured FT researchers increased 85%, compared to 15% increase in number of FT faculty.
  - A majority of S&E post-docs now pursue non-academic careers.
    - In 2006, 43.7% of employed S&E doctorates were at universities or other 4-year colleges; 37.26% were employed with private organizations; 9.1% with government agencies; 6.4% self-employed; and 3.6% employed at other educational institutions and other organizations.
    - In 2006, of S&E doctorates who had received their degress 4-6 years earlier, only 19.8% were in tenure-track or tenured positions.

Weighing the transatlantic career options....

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Don't be discouraged about U.S. career prospects – be realistic.

- The federal and state budgetary crises are severe and will not lessen any time soon. The Obama Administration sees investment in science and technology as critical to U.S. prosperity and job growth, but will face political pressure to reduce the federal deficit.
- The "norm" in U.S. academia may be changing. Expect a debate about the long-term health and financing of public research universities.
- Fewer postdoc's will secure full-time tenure-track faculty positions, and growth in non-tenure opportunities may outstrip tenure opportunities.

Educate yourself about your profession—and know what is most important to you, so you can make informed choices.

- Chronicle of Higher Education; NSF, esp. *Survey of Earned Doctorates*, *Science and Engineering Doctorates;* AAAS, R&D Budget and Policy Program; National Postdoc Association and other scientific societies, associations; www.humanitiesindicators.org
- Trends in research funding in your discipline? Academic and non-academic career opportunities in your field?
- Differences in scientific or work cultures? What do you value and where do you do your best work?
- Personal factors: Dual careers? Family considerations?
- Values and aspirations: Security (health insurance, job security) vs. risk/opportunity? Work/life balance?

Be open to new opportunities and alternative career paths

Contact

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