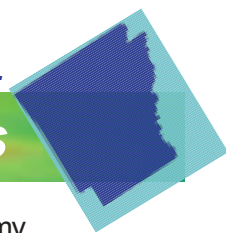




Federally funded research is the Nation's foundation for the future ...

# Federal Science R&D & Arkansas

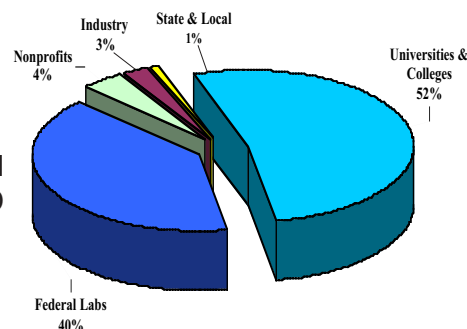


The return on scientific research & development (R&D) investments to the economy and to society is remarkable. Over the last 50 years, advances in science and engineering have produced more than half of the nation's economic growth. Prominent economists agree that *no other investment* generates a greater long-term return to the economy than science R&D.

## R&D and the Arkansas

**Arkansas** ranked 44th among the 50 states in federal R&D spent within the state, with approximately \$120 million spent in FY 2000. Overall R&D expenditures from all sources were nearly \$454 million in FY 2000, making **Arkansas** 42nd nationwide. With a gross state product (GSP) of \$68 billion in 2000, **Arkansas** ranked 34th in the nation. With a GSP *per capita* of \$25,289 in 2000, **Arkansas** ranked 48th in the nation. **Arkansas** had an R&D intensity (the ratio of R&D to GSP) of 0.67% for 2000, making it 47th in the nation.

Arkansas Recipients of Federal R&D Funding by Sector FY 2000



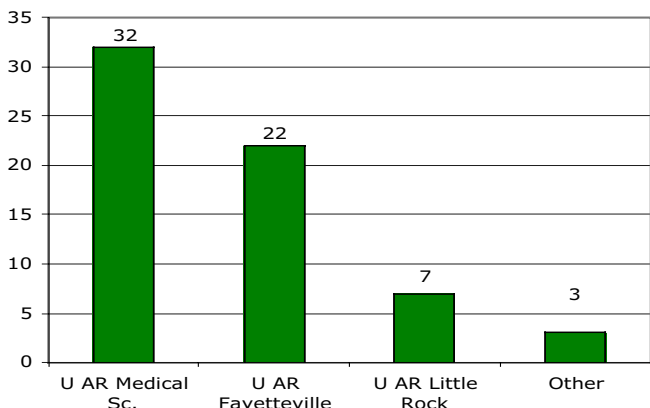
## Federal R&D in Arkansas

Approximately 3% of all federal funds spent in **Arkansas** (not including direct support of individuals) goes toward R&D. Most major federal agencies provide funding for **Arkansas R&D**, foremost of which is the Department of Health & Human Services (HHS) which accounted for approximately 56% of all federal R&D dollars spent in **Arkansas** in 2000. The Departments of Agriculture (USDA) (33%) and NSF (4%) accounted for another 37% of federal R&D expenditures in **Arkansas**. The remaining federal R&D dollars spent in **Arkansas** in 2000 came collectively from the Departments of Defense, Interior, NASA, and several other agencies. Arkansas participates in the **Experimental Program to Stimulate Competitive Research (EPSCoR)** started by NSF to help states that are traditionally under-represented as recipients of Federal R&D funds to become more competitive in winning federal R&D dollars.

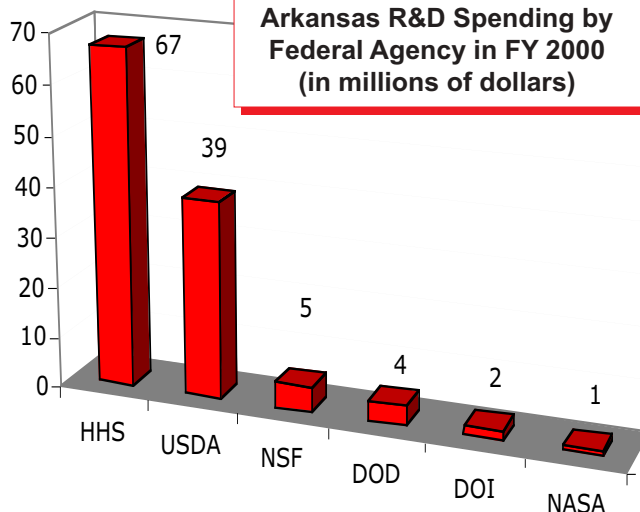
## R&D and a Skilled Work Force in Arkansas

Of the 10.1 million scientists and engineers working in the U.S., more than 3.1 million were employed in S&E occupations, including 21,297 in high tech jobs in **Arkansas** in 2000. Yet despite the continuing demand, universities are awarding fewer technical degrees nationwide. As the primary source of funding for university research, the federal government is critical to the production of the nation's future scientists and engineers.

Federal R&D for Arkansas Universities & Colleges FY 2000 (in millions of dollars)



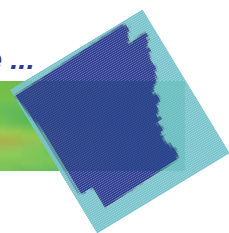
Arkansas R&D Spending by Federal Agency in FY 2000 (in millions of dollars)





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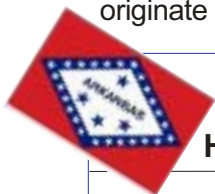
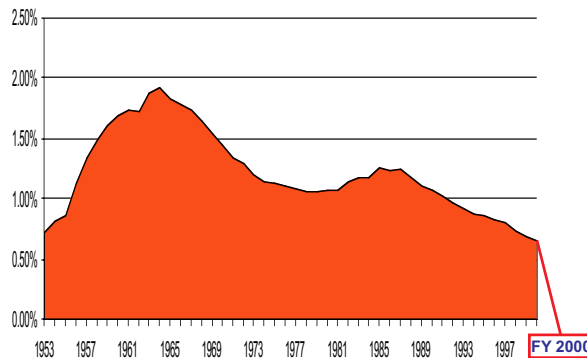
# Federal Science R&D & Arkansas



## Federal Support for Scientific Research Continues Its Long Term Decline & Threatens Productivity Growth ...

Productivity growth in **Arkansas** is driven largely by investment in scientific research & development. Federal support for science R&D as a percentage of U.S. GDP reached an all-time low in FY 2000 and it continues. There is overwhelming evidence that underfunding creates imbalance in the scientific research portfolio, disrupts academic recruiting and grant making, stymies faculty development and infrastructure investment. This deterioration, in turn hampers the educational "pipeline" which provides qualified science & engineering (S&E) workers for U.S. industry, academe and other research institutions. Of all citations in U.S. industry patents, approximately 73% originate from research conducted through federally-funded institutions — about 5 citations per patent.

Federal R&D As a Percentage of U.S. GDP



## HOW ARKANSAS RANKS

- 33rd** in Population (2000)
- 48th** in R&D per Capita
- 37th** in Doctoral Scientists (1999)
- 44th** in Doctoral Engineers (1999)
- 43rd** in S&E Doctoral degrees awarded, 2000
- 48th** in Civilian scientists and engineers as a percentage of the workforce 2002
- 43rd** in Industry investment in R&D as a percentage of Gross State product
- 41st** in patents awarded to state residents, 2000 (215 total)
- 49th** in patents awarded to companies or individuals per 1,000 workers
- 33rd** in total Federal Expenditures 2000
- 51st** in Fed. R&D Obligations, 2000
- 45th** in Venture Capital invested as a percentage of GSP
- 43rd** in High Tech Employment as % of total employment (2001)\*
- 39th** in High Tech Average Wage 2000
- 48th** in Online Population 2001
- 48th** in State New Economy Index 2002\*
- 41st** in Workforce Education (a weighted measure of advanced degrees, bachelor's degrees, etc.) \*
- 41st** in percentage of workforce employed by foreign companies

Sources: U.S. Census Bureau, U.S. Bureau of Labor Statistics, National Science Foundation, National Venture Capital Association, NASDAQ, American Electronics Association, \* Progressive Policy Institute, 2002

## Federal R&D Spending is Highly Concentrated in a Small Number of States — Arkansas was 51st in FY 2000

67% of all R&D moneys were spent in only 10 states and D.C. in 2000. **Arkansas** ranked 51st in overall federal R&D dollars obligated for that year.

Although industry has increased its R&D in a recent years, industry allocates about 70% of its R&D to product development and less than 6% to *basic* science research. Because 60% of all U.S. basic research funding comes from federal sources, there is growing concern that reductions in federal research in the physical sciences, math, and engineering will ultimately harm innovation in industries heavily reliant on these sciences — including defense, aerospace and information technology.

**Arkansas** ranked **4th** in percentage of manufacturing employment (just under 19% of its work force) in 1999.

**Arkansas** had 21,297 high tech jobs in 2000, an increase of 3,800 jobs (+21%) from 1994.

Of the 3.1 million scientific and engineering workers in the U.S., 74% received their highest degree in the physical sciences, engineering, or mathematics. Since 1986, the number of bachelors degrees awarded in the physical sciences has dropped 29%, mathematics is down 19%, and engineering is down 21.1%. Many analysts attribute these declines largely to reduced federal support for university research in these fields. **22 of every 1,000 private sector workers in Arkansas** are employed by high-tech firms.

