

How State/Local Government Invests in Academic Research Infrastructure: An Empirical Study of Funding of University Science and Engineering Research Facilities in the U.S.

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Abstract

There is a general consensus that the growth of academic research capacity is generated from the accumulation of scientific and technical human capital, which includes both human capital endowments such as formal education and training, and social relations and network ties (Bozeman and Corley, 2004). However, relatively less attention has been devoted to understanding of the tangible research infrastructures such as facilities and equipment, which constitute the backbone of American university research capacity. This research intends to examine the current state and recent evolution in the funding of university science and engineering research facilities in the U.S.

The American universities provide important resources necessary for excellence in research and the availability of facilities, equipment, and other factors are critical to the conduct of science and the development of research capacity. The academic R&D activities require substantial financial resources to support operational expenditures primarily on human resources, and to invest in building and maintaining necessary research facilities and equipment. In addition to slightly over \$60 billion of academic R&D expenditures in FY 2011, American higher education institutions spent \$6.4 billion on new construction and another \$3.5 billion on major repairs and renovation of S&E research facilities in FYs 2010-2011. The 2010-2011 funding of S&E research facilities came from multiple sources, including federal government (7.4%), state/local government (28.4%), and other sources (64.2%).

In addition to the overall trend of funding academic S&E research facilities, we are particularly interested in the interactions among the different sources of funding. Given that state/local government provides a larger share of support to research infrastructure than their contribution of operational R&D expenditures, this research will focus on the primary determinants of state/local government funding of university S&E research facilities. We expect that the federal funding may substitute state funding although some federal infrastructure-related grants require matching funds from the recipient states. The data of funding of S&E research facilities are from the *Survey of Science and Engineering Research Facilities*, a congressionally mandated biennial survey to collect data on the amount of funding of research facilities.

This empirical study will improve the understanding about the recent evolution of funding of university research facilities and dynamic relationships among federal, state, and other sources of funding. The findings will shed light on the assessment of some federally funded infrastructure programs such as NSF's Experimental Program to Stimulate Competitive Research and NIH's Institutional Development Award. Since federal government is one of several funding sources, the aggregate amount of resources and the net effects largely depend on how other parties react to the federal research infrastructure initiatives.