The Good/Bad of Federal Investments in R&D

1- The Good: Azoulay& Sampat's review
2- The Bad: Variability of funding

3- Improving Measures/Indicators for better decision-making

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Funding and Impact of Biomedical and Health Research Panel
"Measuring the impacts of federal investments in Research"
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1. A&S Review of Studies

1. Clear impact of funding on effort: biomedical spending has created huge increase in knowledge found in sci papers, and in successes – human genome. Growing research on effects shows up in over half since 2005 and 1/4th in 2010-11

2. But less so on innovative outcomes... slow progress on cancer; basic not enough for Big Pharma; direction not enough directed by disease importance or correct given sci opportunity? Insufficient attention to technology?

3. HIV as outlier or as result of power law of effects. Is it not reasonable to expect modest outcomes but one big hit?

2. Warning: the variability of Federal R&D could be dangerous to career health; US supplies

1. Volatile spending raises the cost of science due to rising marginal cost and quick changes in spending – evidence from NIH doubling is that doubling moneys → modestly smaller number of papers per federal investment compared to earlier period. Makes it easier to cut as failing to meet “promises”.

2. Lost opportunity after Wall Street implosion to shift more of US “best and brightest” from finance/consulting to science. But banking is back, CEO pay is up 13%-26% and science careers look very dicey. High variability of opportunities in science due to uncertain budgets/boom-bust cycles as well as pay differences, long training, affects career decisions.

3) Improving our monitoring of state of science with real-time non-traditional measures of impacts

Careers and supply: job Information from internet job boards (Conference Board); Google search numbers looking for S&E jobs; Proquest data bases to identify supply of expertise by actual work

Crawl and download information on discussion boards – NIH comments about policy for possible govt shutdown.

Basic science: Working papers as leading indicator to publications; Web downloads of papers to measure hot areas. Monitor science discussion/social network groups. Measures of scientific meetings and conferences from web-based information.

Two Gaps in measures of innovation: innovation projects; company to establishment

1) Aggregate R&D $$ and patent statistics for company-sponsored activity, patchier data on innovations falls short of detailed input-output data on basic R&D projects – papers, citations, etc associated with grants (E-SPA).

2) Lack of information on link between firm R&D and innovation at establishment level or of establishment-level activities that creates innovation in production (non-R&D).

A&S slides point out weakness in studies of how basic research translates to innovations. One reason is poor measures of innovations and artificial basic/applied division. Need project data comparable to project data on basic science.