Nominator: Open Philanthropy. Open Philanthropy's mission is to help others as much as they can with the resources available to them. So far, they have concentrated on selecting focus areas in two broad categories: Global Health and Wellbeing and Global Catastrophic Risks.

Curator: Paul Niehaus

Question: What factors drive public sector spending levels for R&D, especially changes to the status quo?

Current state of knowledge (as of 15 November 2024): in short, we know very little.

Economists have devoted tremendous energy to studying the determinants of private investment in R&D, motivated by the observation that "it is often difficult for inventors to capture the full social value of their interventions" (Williams, 2017). Regarding public investment, however, almost all of the work of which we are aware (see in particular Section 2.3 of Bryan & Williams, 2021) has focused on its impacts rather than its determinants.

We know of two panel studies at the national level that have examined correlates of public R&D expenditure. Pellens, Peters, Hud, Rammer and Licht (2024) study the cyclicality of public R&D in 29 OECD countries over the period 1995 to 2019, finding that it is procyclical on average (but countercyclical in the most innovative countries). Sun and Kim (2017) study a range of correlates of R&D expenditure within OECD countries between 1974 and 2012, highlighting "gross domestic R&D expenditure, refinery output, and the rightist orientation of the governing party" as significant predictors.

A few papers and reports discuss broad patterns of public R&D investments within the US. A report titled "Allocating Federal Funds for Science and Technology" (1995), developed by the National Academies of Sciences and Engineering and the Institute of Medicine describes the shift in focus of public R&D investments over the years, highlighting the decentralized budgeting process with allocations determined separately across various federal agencies and departments. On the other hand, Sampat (2012) shows that within the NIH the budgets of the various institutes have tended to move "in lockstep" with each other, so that there is a strong correlation between funding levels in 1980 and those three decades later in 2010.

Decision relevance: Open Philanthropy is interested in driving economic growth so that the health and income of citizens are improved. Their previous work has suggested that public spending on R&D is one of the most effective ways for governments to increase their

citizen's future incomes. They are then interested in knowing how the level of public spending on R&D is set, and if there are tractable ways that Open Philanthropy might advocate for this to be increased.

Timeline: n/a

Ideas & resources: Generally speaking, good data are available. Government expenditure on R&D (GERD) by OECD countries, disaggregated by a few sectors such as education, health, transport, energy etc is available at the OECD Database for Government Expenditure on R&D.

Contrasting changes in private-sector R&D with those in public-sector spending might be useful for suggesting common and/or distinct drivers. For this purpose, data on R&D spending by source (business, government, higher education and non-profit organizations) may be useful, and is available for selected countries at the NSF international comparison of GERD trends. More granular data covering federal and non-federal expenditures (post 2006) and its decomposition by agencies is available for the US at Federal support for R&D by agency and R&D by performer and source of funds.