The Ethics of Research Funding

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"Scientific progress on a broad front results from the free play of free intellects, working on subjects of their own choice, in the manner dictated by their curiosity for exploration of the unknown."

—"Science the Endless Frontier," Vannevar Bush, 1945

Few question the value of research—diligent study of various phenomena performed by network of agencies, individuals and facilities interacting in order to generate knowledge and harness it in the form of inventions. Indeed, scientific investigation, the discovery of the unknown, drives the economy, improves our health and quality of life, and provides a safer environment. Given how valuable the research enterprise is, it requires equally sufficient funds in order to thrive. This issue influences many in society and must be further explored.

Since research results affect everyone in society, information or products emerging from a scientific discovery should have the characteristics of a public good that is available to all. This concept brings about the issue of democratization of science. Since science supports social needs like health care that involve everyone, its exercise and output should be available to anyone. Nevertheless, introducing a democracy into the scholars' world can prove catastrophic; some issues in science are not to be voted upon: A century ago, a democratically chosen government of one of the states passed legislation establishing pi as a rational number! Moreover, some people still lobby for creationism to be taught along with Darwin's evolution in public education.[1] Thus, the pursuit of science should be left to highly specialized individuals and institutions. Still, since it concerns everyone by giving rise to commercialization, it must be responsive to society's needs while getting fair resources necessary for the pursuit of research that will benefit the members of society.

How should society determine the needs of science? Who should be responsible for that? Should it be one institution? Should the research be public or should anyone be free to pursue research? Other questions arise regarding economic efficiency, or in other words, the challenge of relevance. How can the researchers demonstrate to the donators that their research is worth all the money? This problem becomes harder to solve when it comes to public funding—spending taxpayer dollar would seem to require reaching a general consensus.

When looking for incentives for public funding in research, many often focus on externalities.[2] If an individual agent were to fund a research project expecting profits from the venture, very often there would be more benefits than he or she can capture since some will spill over to others. Even though all of the benefits may exceed the cost, the individual benefits to a particular agent may not be sufficient, rendering the enterprise too costly to exploit by this individual. Public funding is expected to fill this gap.[3] Another solution to this problem is utilizing club goods, suggesting that if one donator is not able to secure enough benefits to make the enterprise worthwhile, several of them can possibly internalize the externalities to a sufficient extent.

Some consider this solution a highly successful approach when public funding may not be enough. Public funding is not sufficient to cover all possible research. Moreover, public governance of resource allocation is not as knowledgeable as a club of highly specialized agencies interested in a given topic. A consortium of agencies or people who are focused on a given branch of research and familiar with the technology or research route and its

potential costs and applications will make wiser decisions and be more effective. This allocation of money can thus provide secure investment; the greater knowledge of the specialized individuals increases the probability of success. Ownership of a given investment expedites the process of profit making rather than governing thousand projects across a country as in case of public funding, which hinders close attention to particular ones.

Nevertheless, the issue of accessibility of research results arises. If a research program is covered from private sources as opposed to public money then the investors have a justified right to own the results of work. On the other hand, science should provide us with public goods accessible to anyone to be utilized to the benefit of society as a whole. Second, there exits a risk of monopolization. Companies funding a particular research would not like its profit to spill over to those who did not contribute to its development.[1] Therefore, they will try to secure all the output knowledge. It may take time before society will be allowed to gain from such research. It is debatable whether this aspect does not defeat the purpose of a scientific enterprise. Some may argue that monopolized research is better than none. However, rather than some secret research being performed on a side and public research struggling to reach the same goal, maybe the two should be merged.

By the same argument, defense spending for research seems questionable. The controversy behind military engagement in scholarly research did not exist prior to World War II. But during the war, scientists proved the value of research in military projects and therefore received funding from presidential agencies.[4] Afterwards, the Navy Department established the Office of Naval Research to facilitate scientific investigation. This example was followed by the Army as well the Air Force, which started supporting science by establishing the Office for Ordinance Research and Office of Scientific Research in 1951. ONR supported 40% of campus-based research of basic sciences by 1950 in the US. By 1957, 84% of federal research funds were earmarked for military purposes. In the mid-1960's , many academic scholars engaged in a protest against the US military involvement in the Vietnam War. It led to a distaste for the military establishment on campuses across the country; subsequently many universities, including MIT, Princeton, SUNY/SB and Stanford, adopted policies encouraging their faculty "not to seek research grants and contracts from the Department of Defense", which caused DoD to withdraw its support.[4]

However, with the change in management of DoD, the importance of basic research for modernization of the US military forces was recognized and the support of military agencies of the campus-based research started to grow again. It grew to such an extent that in 1995, *The Tech* claimed that the impact of a proposed cut in DoD research support would have been catastrophic for the Institute with the previous year's $61.6 million from the DoD accounting for nearly one-fifth of MIT's total federal research funding. DoD money still forms the backbone of the nation's academic research in science and engineering; the department funded 42 percent of all engineering research at universities in the 1990s according to National Science Foundation figures. With that figure, the DoD was, and still remains, the single largest supporter of research in engineering.[5]

The military establishment's influence raised an alarm in mid 1980s, when a need for redefining the relationship was called upon.[6] MIT operates under the principle of free scientific pursuit of knowledge for its own sake, implying freedom to choose one's research direction. However, the availability of military money puts academic decisions into an economic framework of operation. The resulting bias causes MIT to allocate its resources in a disturbing manner, causing the technical fields that do not offer immediate military applications to stagnate.

The controversies arise mostly from the restraints military funding places on the academic world. The money could be devoted to other purposes concerning everyone like researching new therapies to dangerous diseases. As citizens of this country we all participate in its expenses no matter if we like their purposes or not. Still defense systems may prove as valuable as a new therapy. The controversy mostly stems from the fact that military related research often operates under auspicious of safety and state security, which threatens the economic and social purposes of research. As in the case of private funding, the military has a right to impose restrictions on release and accessibility of information resulting from research. Security issues are an excuse powerful enough to withhold the information brought by researchers. Again, this issue is not new; in 1981, MIT declined $250,000 contract from the Air Force because of federal control over the research results (unpublished communication: Alice Ghast, Sept. 11, 2003).

In case of applied research this sanction seems plausible. If the military is looking to learn something highly specific relating to their operation it may not concern anyone else and could be kept confidential. However, the money from the Department of Defense goes to a variety of disciplines, many of which are devoted to basic research, where the release of findings is crucial for advancement.

Last but not least, many controversies arise from pharmaceutical companies supporting biotechnology research. This interest definitely does not follow from a selfless beneficiary interest. Instead, there exists a clear sense of purpose; a company needs to support specific work because the results will help develop better products, which in turn will let the company gather more market shares. An example of this kind of collaboration may be Genomics Institute of the Novartis Research Foundation, which openly states that they maintain "a close relationship with Novartis Pharma, engaging in collaborative projects with their research teams, as well as

providing exciting opportunities to further expand technological innovation."[7] Yet, the *relationship* with the institute seems a fair play since it was co-founded by the company itself. Many biotech or pharmaceutical companies usually enter the arena of campus-based or public research by luring scientists with immense funding. These opportunities have a profound impact very often changing the direction of research projects.[8]

In summary, a question arises whether there exist an ethical way of funding research. It seems that there is always a party left unsatisfied; federal money cannot support everyone; private and military funding may harm society by monopolizing the outcomes of research. Society should create an environment for scientists where they can work for its benefit. A favorable policy may be an answer to this problem. If we could grant long patents to outstanding discoveries, introduce tax exempt benefits or help in reducing financial risk, research would be facilitated to a great extent, without spending, sharing or dividing even a cent of public money.

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