Information Innovation Intangible Economy

Federal Investments in Intangibles
FY 2022 Edition

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Knowledge-based and intangible assets—information, workforce skills and know-how, effective management and marketing, business models, relations with suppliers and customers, and software and databases as well as traditional intellectual property (patents, copyrights, and trademarks)—are the building blocks of future economic growth. As former Federal Reserve Chairman Ben Bernanke has said, the topics of innovation and intangible capital "are central to understanding how we can best promote robust economic growth in the long run."[1] Over two decades ago, economists estimated that the investment in the creation of intangible assets in the U.S. was more than $1 trillion annually.[2] That investment has continued to grow, so that business investment in intangible assets is now greater than in tangible assets, such a buildings and equipment.[3] According to one estimate, intangible assets make up 90% of the S&P 500 market value.[4]

The public sector, including the federal government, also makes major investments in intangible assets. Estimates are that total public investment in intangibles in the U.S. reached 2.6% of GDP by 2013.[5] Some of these are investments in the general economy, such as education and R&D spending. Some are activities that are considered public goods that generate intangible assets used in the private sector, such as weather information. Others are for the support of government activities but have a private sector value use, such as statistically data. Still others are for internal government activities, such as government worker training and agencies' logos or brands.

Like the private sector, the federal government needs to understand the investments it is making in intangible assets. However, it appears that there is little systematic attention to these assets as assets. As a result, the federal government does not know what intangible assets it has, does not know how much it spends on developing intangible assets, and does not know the value of those intangible assets (either to the internal operations of the Federal government or in the external marketplace).

This analysis looks at one aspect of the federal government's intangible assets: the investment in these assets as reflected in the *Budget of the United States Government, Fiscal Year 2022*.[6] It should be noted that this is a rough estimate of investment in intangibles—very rudimentary and incomplete. It does however give an approximate order of magnitude of those investments. It also helps articulate and highlight some of the myriad of government programs that invest in the development of intangible assets.[7]

This report is an update of previous report on the propose FY 2014 and FY 2016 budgets.[8] Note that while this analysis is not identical to the previous report due to changes to some government accounts and programs, it is comparable.

Overview of Federal Investment in Intangible Assets

Federal Investment in Intangibles (billions)	**FY 2020 actual**	**FY 2021 enacted**	**FY 2022 proposed**
Information and intellectual property			
R&D funding (not including facilities & equipment)			
Defense	$63.1	$68.9	$70.1
Nondefense	$70.5	$78.1	$89.2
Arts & humanities/museum funding	$1.3	$1.6	$1.6
Government information creation			
Statistical agencies	$8.4	$5.1	$3.7
Weather service	$1.3	$1.4	$1.6
Library of Congress/CBO/GAO/GPO	$1.4	$1.7	$1.6
PTO	$3.4	$3.8	$4.2
Individual Human Capital (know-how)			
Education and training			
Grants to state and local governments	$60.8	$95.0	$128.4
Direct Federal outlays	$192.3	$188.4	$131.3
Training of government personnel (military)	$11.3	$11.3	$12.0
Social Capital (Alliances & Networks)			
Organizational capacity building & technical assistance			
Community (HUD, EDA)	$0.3	$1.1	$5.5
Company (MEP, SBA)	$0.5	$0.8	$1.8
Brands and marketing - reputation			
Export promotion	$1.0	$1.1	$1.3
Product safety, food safety, drug safety	$8.3	$10.3	$9.4
Total Investment in Intangibles	$424.0	$468.4	$461.7
Nondefense total	$349.6	$388.2	$379.6
Total Discretionary Outlays	$1,627	$1,695	$1667
Defense	$714	$735	$754
Non-Defense	$913	$960	$913
Intangibles as percent of discretionary	26%	28%	28%
Nondefense intangibles as % of nondefense discretionary	38%	40%	42%

As the table above indicates, over a quarter (28%) of the discretionary part of the federal budget is devoted to investments in intangibles. That rises to over two-fifths (42%) for nondefense discretionary spending. By comparison, ten years ago investments in intangibles made up 20% of the discretionary part of the federal budget and 28% of nondefense discretionary spending (see appendix A).

Analysis of Investments

Most of the intangible investments by the U.S. federal government are in education and R&D. However, many of the more modest investments are of great importance. For example, food and drug safety activities are vital to the brand reputation in those areas. Successful programs such as the Manufacturing Extension Program (MEP) have returned far more back to the economy that their costs. The value of a trained military is incalculable.

As I stressed earlier, the analysis does not include all expenditures in a particular category of intangible, especially government training and community/company capacity building. The analysis does not necessarily include internal policy research undertaken by the federal government, including program evaluation studies. Nor does it include internal innovation activities (such as the Defense Logistical Agency internal R&D program to improve their operations, which includes Human-centered design training).

Nor does the analysis include all possible intangible assets. While there are is an argument to be made that a healthy workforce is a more productive workforce, I have not explicitly not included funding for health, safety and environmental protection. Note also that the government can create an intangible asset for others, without investing in it, through granting monopoly rights: Intellectual Property (IP), landing slots, water rights, mining rights, broadcast rights, etc. In some cases, the government actually makes money from these intangibles, such as spectrum and broadcast licenses, certain mineral rights, etc. Another major area of intangibles are contracts and legally enforceable business relationships. I have not, however, included either the costs and revenues associated with government created assets nor the cost to the government of enforcement of civil legal actions.

Gathering information on intangibles investments in the federal budget is both easy and difficult. The *Analytical Perspectives, Budget of the United States Government*, as prepared by the White House Office of Management and Budget (OMB), includes a crosscutting analysis of investments covering physical capital, R&D, and education and training as well as a more detailed analysis of the R&D budget. In the past, the budget documents also contained a separate analysis of funding of statistical agencies, which is not included in the investment budget. As this was not included in the current budget documents, data used here was compiled from individual budget requests from each of the 13 statistical agencies. Likewise, other investments in intangibles needed to be teased out of the budgets for specific agencies (see Appendix B).

The lack of data hinders our understanding of government-created intangibles and makes management difficult. For example, there is no crosscutting analysis of the federal budget for arts and humanities, which is spread across the government with many agencies sponsoring their own arts projects. Likewise, the size of the federal commitment to capacity building is unclear. And the size of federal promotion (branding) activities is unknown. Thus, the government's activities in promoting and

managing intangible assets is visible in the high-ticket areas of science and education while next to invisible in all other areas.

Management of Investments

The range of federal government intangible assets is broad. As I noted earlier, some of these intangible assets are developed to spur the economy, for example federal funded research and education activities. Many more hidden examples of intangible assets are those developed as part of the standard operations of the government. However, the federal government seems to have a makeshift set of policies for managing these intangible assets and generating revenues based on them.

A few other nations have taken steps to better manage their public intangible assets. For example, in the UK, the HM Treasury has undertaken an analysis of public sector "knowledge assets" and developed a strategy for better managing them.[9] They even publish a blog on the topic.[10,11] The most advanced version of government management of intangible assets is the French Agence du patrimoine immatériel de l'Etat (APIE).[12] APIE acts as an internal consultant to help agencies of the French government generate value from their intangible assets. This includes licensing of public-sector know-how and the trademarks (such as the Louvre Museum and the museum management expertise), generating revenue from commercial repackaging of government information, and use of national buildings and monuments as film locations or for hosting events.

The U.S. Government also engages in all of these types of activities. But policies do not seem to be coordinated or systematic. Nor does there appear to be any management plans in place for the appropriate utilization of these intangible assets in any systematic way for revenue generation. Rather, there are numerous examples of Federal government intangible assets appearing to be subject to ad hoc policies. For example, was there a systematic asset management policy behind the decision some years ago to separate the USDA Graduate School from the Agriculture Department? What were the asset management considerations behind the decision to spin out the Index of Leading, Coincident and Lagging Indicators (an important economic statistic) from the Commerce Department?

In the area of information policy, it is unclear whether there a systematic asset management policy behind the setting of fees for and access to the government generated data and information (including statistical data and other types of information such as from the Weather Service). While there are laws and policies in place regarding the sale and/or licensing of patents (technology transfer), there is a seems to be a lack of government-wide and agency-specific management plans for promoting these licensing activities. Likewise, there is no government-wide and agency-specific plans for managing and promoting the licensing of government brands and trademarks (Woodsy Owl and Smoky the Bear are treated differently than "SEAL Team 6" or "FBI"). The granting of airport landing slots, water rights, mining rights, spectrum and broadcast licenses don't seem to treat these as valuable assets but rather handle each as a special case.

One often overlooked intangible asset is the expertise of Federal employees. This expertise ranges from business-related expertise, such as knowledge of various foreign markets or domestic business activities, to highly technical scientific and engineering knowledge. There seems to be various policies for access to and fees from technical expertise of Federal employees by the private sector. But there

does not seem to be any management plans to market that technical advice to connect that knowledge to potential users.

All of these examples point to the need for a comprehensive look at laws, regulations and policies that government federal intangible assets.

Conclusion

The federal government is a major investor in intangibles, but we don't know the size of that investment or even where it really goes. For some time, the federal budget, as prepared by OMB, has included a capital budget that includes physical capital, R&D, and education and training and a separate analysis of funding of statistical agencies. But there are many more investments in intangible assets hidden within the budget. Without information on these hidden assets, effective management of these public assets is difficult, if not impossible. Our current ad-hoc approach to managing assets demonstrates that difficulty. We need a better system for tracking investment in and then managing our governmental intangible assets.

A first step would be the creation of a cross-cutting budgetary analysis of federal investments in intangible assets. The capital budget analysis already undertaken by OMB can serve as the starting point. Second would be a comprehensive study, possibly by the Government Accountability Office (GAO), of federal government intangibles assets and the policies in place to effectively utilize those assets. A comprehensive look at government policies and investments in intangible assets would be a follow on to existing GAO activities. The result of such studies would be a better understanding what intangible assets we have -- and how best to manage them.

Notes

[1] New Building Blocks for Jobs and Economic Growth: Intangible Assets as Sources of Increased Productivity and Enterprise Value -- Report of a Conference May 16–17, 2011, Athena Alliance, September 2011, https://intangibleeconomy.files.wordpress.com/2016/02/intangibles-conference-report-september-2011.pdf

[2] Leonard Nakamura, "What Is The U.S. Gross Investment In Intangibles? (At Least) One Trillion Dollars A Year!" Working Paper No. 01–15. Federal Reserve Bank of Philadelphia, October 2001, https://ideas.repec.org/p/fip/fedpwp/01-15.html

[3] Corrado C, Haskel J, Jona-Lasinio C, et al. (2018). "Intangible investment in the EU and US before and since the Great Recession and its contribution to productivity growth". *Journal of Infrastructure, Policy and Development*; 2(1): 205, 2018. doi: 10.24294/jipd.v2i1.205.

[4] https://www.oceantomo.com/intangible-asset-market-value-study/

[5] Bacchini, F., C. Corrado, J. Hao, J. Haskel, R. Iannaccone, M. Iommi, K. Jager and C. Jona-Lasinio, *Estimates of intangible investment in the public sector: EU, US, China and Brazil* SPINTAN Working Paper No. 11, April 2016 http://www.spintan.net/wp-content/uploads/public/WP_11_Bacchini_Corrado_Hao_Haskel_Iannaccone_Iommi_Jager_Jona.pdf

[6] Budget of the United States Government, Fiscal Year 2022, Office of Management and Budget, Executive Office of the President, May 2021, http://www.whitehouse.gov/omb/budget

[7] This framework was first described in a 2008 presentation at a National Academies of Sciences, Engineering, and Medicine workshop "U.S. Policies for Fostering Intangible Assets," https://intangibleeconomy.files.wordpress.com/2016/02/policyonintangibles-step.pdf.
See National Research Council, *Intangible Assets: Measuring and Enhancing Their Contribution to Corporate Value and Economic Growth*. The National Academies Press, 2009 https://doi.org/10.17226/12745
https://www.nap.edu/catalog/12745/intangible-assets-measuring-and-enhancing-their-contribution-to-corporate-value

Note that in 2016 the SPINTAN project formulated a similar but different classification system and manual for collecting data on public investments in intangibles (see http://www.spintan.net/). A current project, GLOBALINTO, is formulating its own approach to analysis of public sector investment in intangibles (see https://globalinto.eu/wp-content/uploads/2021/06/BiannualZoomMeeting2021_05_25SaradaJakobPolicyPublic-Sector-and-Intangibles-1.pdf)

[8] Kenan Patrick Jarboe, *Federal Investments in Intangibles: A Look at the President's FY 2014 Budget*, Athena Alliance Working Paper #9, April 2013 https://intangibleeconomy.files.wordpress.com/2018/05/federalinvestmentsinintangiblesfy2014.pdf and, Kenan Patrick Jarboe, *Federal Investments in Intangibles: A Look at the President's FY 2016 Budget*, Athena Alliance Working Paper #12, February 2015 https://intangibleeconomy.files.wordpress.com/2016/02/federalinvestmentsinintangiblesfy2016.pdf

[9] HM Treasury, *Getting smart about intellectual property and other intangibles in the public sector: Budget 2018*, October 2018 https://www.gov.uk/government/publications/getting-smart-about-intellectual-property-and-intangible-assets,
and HM Treasury, *Getting smarter: a strategy for knowledge & innovation assets in the public sector*, April 2021 https://www.gov.uk/government/publications/getting-smarter-a-strategy-for-knowledge-innovation-assets-in-the-public-sector-the-mackintosh-report

[10] https://knowledgeasset.blog.gov.uk/

[11] Note that this is not the first attempt to address the issue. In the mid-2010s, the UK Intellectual Property Office set up a process of offering advice to government agencies on managing their intangible assets through their Intangible Assets Network, which was subsequently disbanded. http://www.ipo.gov.uk/ian.htm

[12] http://www.economie.gouv.fr/apie

APPENDIX A

Federal Investment in Intangibles (billions)	**FY 2012 actual**	**FY 2022 proposed**
Information and intellectual property		
R&D funding (not including facilities & equipment)		
Defense	$75.1	$70.1*
Nondefense	$63.7	$89.2
Arts & humanities/museum funding	$0.9	$1.6
Government information creation		
Statistical agencies	$2.6	$3.7
Weather service	$0.9	$1.6
Library of Congress/CBO/GAO/GPO	$1.1	$1.6
PTO	$2.3	$4.2
Individual Human Capital (know-how)		
Education and training		
Grants to state and local governments	$63.9	$128.4
Direct Federal outlays	$33.0	$131.3
Training of government personnel (military)	$11.4	$12.0
Social Capital (Alliances & Networks)		
Organizational capacity building & technical assistance		
Community (HUD, EDA)	$0.7	$5.5
Company (MEP, SBA)	$0.3	$1.8
Brands and marketing - reputation		
Export promotion	$0.8	$1.3
Product safety, food safety, drug safety	$4.6	$9.4
Total Investment in Intangibles	$261.4	$461.7
Nondefense total	$174.9	$379.6
Total Discretionary Outlays	$1,285	$1667
Defense	$671	$754
Non-Defense	$614	$913

* Note: in 2016 some DOD R&D spending was reclassified as acquisition. As a result, the current proposal is approximately $25 billion lower that what is would have been under the old classification system and intangibles would have been 29% of total discretionary outlays rather than 28%. See Christopher Pece and John Jankowski, "Statistical Definition of Development Clarified: Effect on Reported Federal R&D Totals", NSF 21-326, National Center for Science and Engineering Statistics April 2021 https://ncses.nsf.gov/pubs/nsf21326

Intangibles as percent of discretionary	20%	28%
Nondefense intangibles as % of nondefense discretionary	28%	42%

APPENDIX B

Data Sources: US Federal Government Investment in Intangibles FY 2022

Information creation and intellectual property

- R&D funding: *Analytical Perspectives, Budget of the United States Government,* "Federal Investment"
- Arts & humanities/museum funding: Budgets for National Endowment for the Arts, National Endowment for Humanities, Smithsonian Institution
- Government information creation:
  - Statistical agencies: *Analytical Perspectives, Budget of the United States Government, Supplemental Materials,* "Budgets of the Federal Statistical Agencies," Table 22-1 (not yet available)
  - Weather service – Department of Commerce Budget for the National Weather Service portion of the National Oceanographic and Atmospheric Administration (NOAA)
  - Library of Congress/Congressional Budget Office (CBO) /Government Accountability Office (GAO)/Government Printing Office (GPO) – Legislative Branch budget for each of these agencies
  - Patent and Trademark Office – Department of Commerce budget for PTO

Individual Human Capital (know-how)

- Education and training: *Analytical Perspectives, Budget of the United States Government,* "Federal Investment"
- Training of government personnel (DOD): specific line items for training in the budgets of the Army, Navy, Air Force, Marines and DOD-wide. Does not include training of Reserves or National Guard.

Social Capital (Alliances & Networks)

- Community: HUD - capacity building grants, EDA - non-public works grants)
- Company (MEP, SBA): Commerce Department Budget for the Manufacturing Extension Partnership (MEP) and the Manufacturing USA programs; Minority Business Development Agency; and Entrepreneurial Development Programs (non-credit programs) of the Small Business Administration

Brands and marketing - reputation

- Export promotion activities: Commerce Department's U.S. & Foreign Commercial Service and Global Markets program; Agriculture Department's Foreign Agricultural Service and Agricultural Marketing Services; Commodity Credit Corporation's Market Access Program; US Trade and Development Agency; Brand USA (Corporation for Travel Promotion)
- Product safety, food safety, drug safety (investments in product reputation): budgets for the Consumer Product Safety Commission (CPSC), the Food and Drug Administration (FDA) and the Department of Agriculture inspection activities (Animal and Plant Health Inspection Service and Food Safety and Inspection Service)

Notes on Data Sources

Data for PTO and FDA are gross outlays (discretionary and mandatory) as they are mainly funded by non-federal (fee) sources.

The budget documents do not show outlays for the Commerce Department's Global Markets program and Industrial Technology Services, for the Agricultural Department's Market Access program, and HUD community capacity building programs (the Capacity Building for Community Development and Affordable Housing Program and the Rural Capacity Building Program). In those cases, data on obligations is used instead.

NIST Industrial Technology Services includes the MEP centers and the Manufacturing USA institutes. The FY 2022 proposed budget includes an additional $1 billion for these programs as proposed in the American Jobs Plan

The FY 2022 budget documents do not contain the special analysis of the 13 statistical agencies, which would normally be included. The analysis here attempts to replicate that by compiling budget outlays directly from each of the 13 agencies budgets.

- Census budget for FY2020 includes funding for 2020 Census.
- Budget for the National Center for Education Statistics includes funding for the National Assessment of Educational Progress and the National Assessment Governing Board (per OMB's analysis).
- Data for Bureau of Justice Statistics is obligations and includes just BJS and not other information related activities such as the National Institute of Justice.
- Budget for the Bureau of Transportation Statistics is not available. Funding level from the last few years of $26 million is used instead.
- National Center for Health Statistics funding data is taken from the CDC FY-2022 congressional justification https://www.cdc.gov/budget/documents/fy2022/FY-2022-CDC-congressional-justification.pdf and is budget authority
- National Center for Science and Engineering Statistics funding data is taken from the NSF FY 2022 Budget Request to Congress https://www.nsf.gov/about/budget/fy2022/index.jsp and is budget authority.
- Office of Research, Evaluation, and Statistics (Social Security Administration) funding data is not available. The previous levels of $30 million are used.
- Statistics of Income Division (Internal Revenue Service) funding data is not available. The previous levels of $35 million are used.
- Note that there might be some double counting of statistics programs as R&D programs. For example, the data for non-defense R&D includes the entire NSF budget (including funds for the National Center for Science and Engineering Statistics).

Data includes National Weather Service and National Environmental Satellite, Data, and Information Service funding but not other parts of the National Oceanic and Atmospheric Administration which may have information and data creation activities such as the National Ocean Service.

Smithsonian budget includes the Smithsonian, the John F. Kennedy Center for the Performing Arts, the National Gallery of Art, and the Woodrow Wilson International Center for Scholars.

The Agricultural Market Service budget contains more than export promotion.