



NATIONAL SCIENCE BOARD
Science & Engineering Indicators



Innovation

Translation to Impact: U.S. and Global Science, Technology, and Innovation Output

Technical Appendix

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The National Science Board (Board) is required under the National Science Foundation (NSF) Act, 42 U.S.C. § 1863 (j) (1) to prepare and transmit the biennial *Science and Engineering Indicators (Indicators)* report to the President and Congress every even-numbered year. The report is prepared by the National Center for Science and Engineering Statistics (NCSES) within NSF under the guidance of the Board. It is subject to extensive review.

Table Of Contents

AUTM University Technology Transfer Data and Methodology	3
Data	3
Limitations	7
Funding Acknowledgments Data and Methodology	7
Data	8
Limitations	8
Open-Source Software Data and Methodology	9
Data	9
Limitations	10
PitchBook Venture Capital Data and Methodology	10
Data	11
Limitations	17
Key to Acronyms and Abbreviations	17
References	17

Technical Appendix

AUTM University Technology Transfer Data and Methodology

The Bayh-Dole Act of 1980 (Patent and Trademark Act Amendments of 1980, P.L. 96–517) is the foundation of the U.S. technology transfer system. It is a federal law that allows universities, nonprofit research institutions, and small businesses to retain ownership of inventions developed through federally funded research. Academic institutions often view technology transfer as part of their economic or social “third mission,” alongside research and teaching (Compagnucci and Spigarelli 2020; Leydesdorf 2010). Revenue generated through copyrights, trademarks, and technology licensing provides a financial incentive for universities, although most universities do not fully recapture the cost of operating a technology transfer office. Those university patents that do result in technology licenses to companies shed light on the commercialization pathways that university innovations take for broader applications.

University technology transfer offices (TTOs) provide a variety of support to faculty, researchers, and students that ranges from education about what constitutes intellectual property and when to file an invention disclosure to the filing of patents, contract negotiations, and assistance during the formation of a start-up company. AUTM is a membership-based organization for these technology transfer professionals with approximately 3,000 members (AUTM 2025). Each year, AUTM surveys member institutions to collect data on research expenditures, invention disclosures, patent applications, patents awarded, licenses and options executed by established firms and startups, licensing income, university startups created, number of TTO staff, and other related metrics. The survey data are available to AUTM members and subscribers through their Statistics Access for Technology Transfer (STATT) Database.

Indicators reports have reported AUTM survey data for several cycles to capture representative data on academic technology transfer. The primary federal survey for academic research and development (R&D) expenditures, the Higher Education Research and Development (HERD) Survey (<https://www.nsf.gov/statistics/srvyherd/>), does not include questions related to technology transfer. Patent and Trademark Office (USPTO) data capture patenting activities at the time of filing and of granting of a patent. AUTM provides insights into earlier stages of technology commercialization, such as invention disclosures, as well as later stages, such as the licensing and optioning of technologies and the creation of startups.

Data

AUTM is a large professional organization of technology transfer professionals in the United States and worldwide, with over 3,000 members from over 800 research institutions (AUTM 2025). AUTM’s annual member survey compiles technology transfer indicators that are not otherwise available from member institutions into a centralized source. AUTM is a unique source of information about post-patenting applications of university technology because the TTOs play a critical role in facilitating technology transfer activities at their institutions.

AUTM reports a response rate of 60.4% in 2024, with 204 responses out of 338 invited member institutions invited to participate in their 2024 survey (Table SATRN-1). Both the number of respondents and the invited institutions have increased a little from 2016 to 2024. However, the response rate has slightly decreased over that time. Data are subject to revision; data from more than 2 years prior are not updated and are considered part of the historical record (AUTM 2024).

Table SATRN-1. AUTM institution coverage and response rates: 2014–24

(Number and percent)

Year	All institution responses (including confidential responses)	Member institutions invited to take survey	Response rate (%)	All named institutions in AUTM data (not including confidential responses)	Named universities in AUTM (not including confidential responses)	Universities in AUTM with matches in HERD (%)
2014	NA	NA	NA	179	146	100.0
2015	NA	NA	NA	195	156	100.0
2016	195	309	63.1	192	156	100.0
2017	193	312	61.9	187	155	100.0
2018	198	312	63.5	188	155	100.0
2019	179	312	57.9	167	139	100.0
2020	197	312	63.1	182	148	100.0
2021	155	312	49.7	147	123	100.0
2022	200	349	57.3	174	142	100.0
2023	205	229	89.5	190	154	100.0
2024	204	338	60.4	185	152	100.0

NA = not available.

HERD = Higher Education Research and Development Survey.

Note(s):

Some AUTM survey responses were confidential. While the AUTM data include these confidential responses, the institutions that responded confidentially are not included in analyses of coverage. The number of institution responses were reported by AUTM in their technical documentation for their yearly reports from 2016 through 2024. Named universities included only universities that were designated "University" in AUTM and that were hand-validated and corrected.

Source(s):

AUTM, AUTM Licensing Survey (various years), accessed January 2026.

Science and Engineering Indicators

Institutions reporting to AUTM as university systems (or as other entities encompassing multiple university campuses) were matched to each corresponding institution in HERD, if available ([Table SATRN-2](#)). For example, the State University of New York university system reports as a single institution in AUTM but consists of 64 colleges and universities, 28 of which report to HERD. As a result, AUTM underreports the count of HERD universities because it does not break out all systems. See the count of “named institutions in AUTM” in [Table SATRN-1](#) compared to the count of “HERD institutions matched in AUTM” in [Table SATRN-2](#). By disaggregating university systems into their constituent colleges and universities, this approach accounts for shifts in reporting structure across years.

Table SATRN-2. AUTM coverage of institutions surveyed in the Higher Education Research and Development Survey: 2014–24

(Number and percent)

Year	HERD institutions count	HERD institutions matched in AUTM	Matched (%)	Only university responses to AUTM (not including confidential responses)
2014	889	248	27.9	245
2015	898	271	30.2	268
2016	896	271	30.2	268
2017	898	254	28.3	251
2018	911	267	29.3	264
2019	914	235	25.7	233
2020	916	269	29.4	268
2021	908	224	24.7	222
2022	900	242	26.9	230
2023	914	247	27.0	235
2024	925	225	24.3	212

HERD = Higher Education Research and Development Survey.

Note(s):

Note that some institutions in AUTM responded confidentially, so a small number of AUTM respondents are not represented here and might have HERD matches. Institutions in AUTM that are specified as university systems were matched to all branch campuses in HERD; however, universities with multiple campuses that were not specified as university systems in AUTM were matched only to the flagship campus in HERD. For this reason, the Only university responses to AUTM (not including confidential responses) column takes responses from the HERD institutions count column and breaks out any university systems into the institutions in that system that respond to the HERD Survey.

Source(s):

AUTM, AUTM Licensing Survey (various years), accessed January 2026.

Science and Engineering Indicators

Institutions reporting to AUTM's survey comprise between a quarter and a third of the institutions that report to HERD ([Table SATRN-2](#)). The slightly lower response rates to the AUTM survey in 2021 and 2024 may contribute to the lower coverage of HERD institutions in those same years. However, across all years, several factors explain the match rate remaining at or under 30%. College and universities that report to HERD span emerging research institutions, with from \$150,000 to \$100 million of total research expenditures, to much larger R1 and R2 research universities, with from \$100 million to over \$1 billion of total research expenditures. The majority of institutions that report to HERD is below the threshold of R&D activity that merits the institutional investment in TTOs or the employment of technology transfer professionals. Furthermore, membership in AUTM or reporting to the annual AUTM survey is not mandatory, and not all university TTOs report to AUTM surveys each year. In addition, a small number of institutions submitted their surveys to AUTM confidentially, and their names were not available for matching between HERD and AUTM.

Limitations

As a measure of all academic technology transfer, the AUTM data appear to undercount at least some aspects of technology transfer activity. The AUTM survey reports patents granted based on university technology, reporting 6,074 patents issued in 2023 and 6,437 in 2024. Based on the analysis of USPTO utility patents described in the *Science and Engineering Indicators 2026* report "Translation to Impact: U.S. and Global Science, Technology, and Innovation Output," the count of academic patents was 6,612 in 2023 and 6,761 in 2024 (Figure TRN-7). The undercounting of patents issued to universities in AUTM data has been improved with successive data updates to AUTM's STATT database since the prior *Science and Engineering Indicators 2024* report "[Invention, Knowledge Transfer and Innovation](#)" (NSB 2024, [Technical Appendix](#)).

In addition, some technology transfer activities may not be captured by the university TTO. Technology transfer may also be defined more broadly as "academic engagement" or "informal technology transfer" encompassing consulting, collaborative research, or other forms of exchange with the private sector that would not be captured by measures counting formal licensing (Perkmann et al. 2013).

In the 2022 and 2023 editions of the AUTM licensing survey, one of our key variables, "total licenses executed," was not included as a survey question (Figure TRN-4). In its prior data releases, AUTM constructed the 2022 and 2023 "total licenses executed" by aggregating other relevant responses. However, in the current data release (accessed January 2026), this variable remains blank for 2022 and 2023, so the "total licenses executed" that we report for these years are from the prior data release (accessed July 2025).

There is a difference between the "Licenses/options: With startups" variable (Figure TRN-4), which was discontinued as an AUTM survey question in 2021, and the "Start-up companies based on licensed university technology" variable (Figure TRN-5). The former includes any license or option granted to a startup, regardless of whether the startup was preexisting before licensing the technology. The latter includes only startups that were formed specifically for developing university technology.

Funding Acknowledgments Data and Methodology

Funding acknowledgments can shed light on the ability and priorities of federal funding to support discovery as measured by peer-reviewed journal articles and conference proceedings. However, some benefits and limitations of this emerging data source are important to highlight so as to accurately interpret these trends.

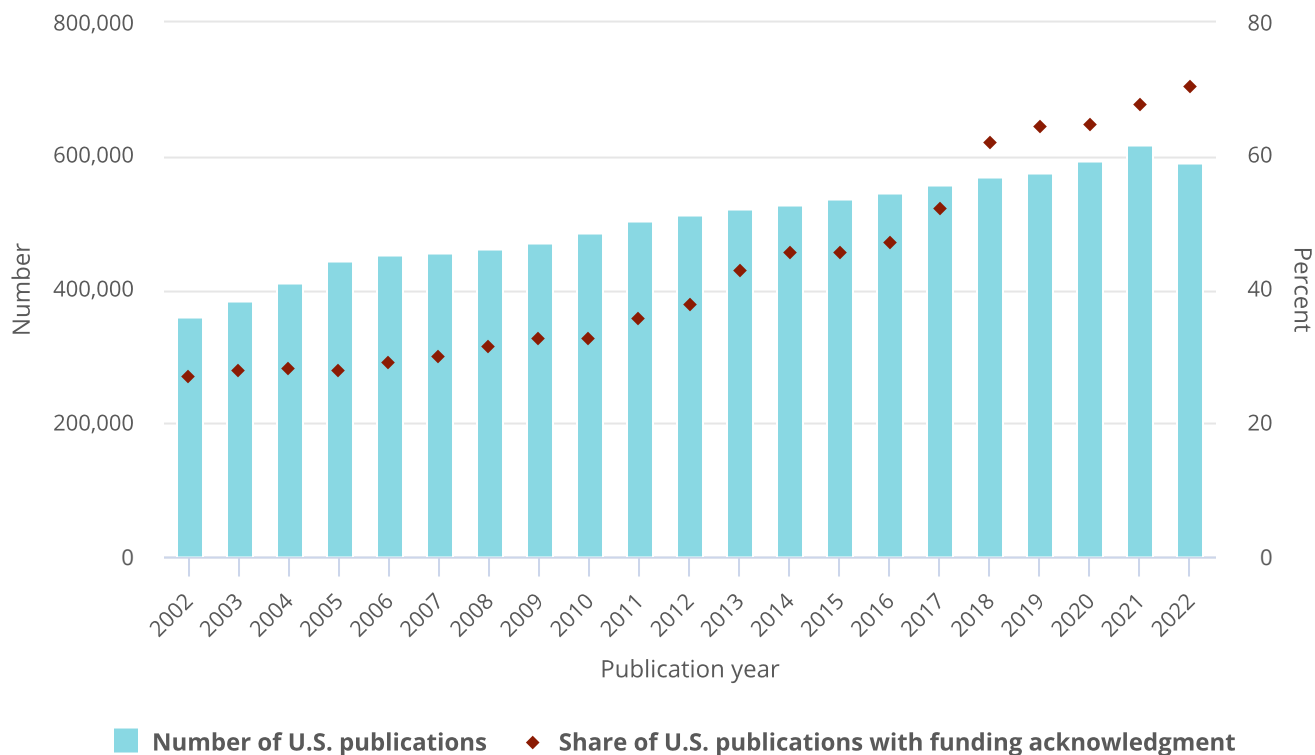
Data

The methodology used for federal funding acknowledgments in Table TRN-2 and Table STRN-1 was previously employed in the *Indicators 2024* report *Publications Output: U.S. Trends and International Comparisons* (NSB 2023: [Publication Output by Region, Country, or Economy and by Scientific Field](#)). Each peer-reviewed journal article and conference proceeding in the Scopus database includes a field for funding acknowledgments that are extracted by algorithmic (software) means. In some cases where the acknowledgments field is incomplete, funding information from agencies is also used to identify funded publications in Scopus. Using this field, it is possible to observe the conversion of federal funds to published research outputs, but a direct linkage between funding inputs and published discoveries remains challenging.

Limitations

First, extraction of this information into a structured field is a relatively new effort and is most complete for the most recent 4 years. [Figure SATRN-1](#) shows how funding acknowledgment sections have grown in coverage from 2002 (27.1% of publications with U.S. authors acknowledging a funding institution) to 2022 (70.5%). Missing data in funding fields in a Scopus entry may mean that the research did not receive funding, the authors did not cite any funding despite receiving it, or the algorithm was unable to extract the acknowledgment. In past analyses, the growth of coverage of funding was not clearly linked with federal funding acknowledgments that provided evidence that the data source has become more dependable over time (NSB 2023). In addition to improved extraction, many factors may have contributed to this growth, including increasing pressure and requirements from funders to include funding acknowledgments, standardization of acknowledgment language, and incentives to demonstrate high publication output—because future funding is tied to past conversion of funds into publications—while receiving funding. For further technical discussion, see *Science-Metrix* (2026).

Figure SATRN-1. Share of published articles with funding acknowledgment statements: 2002–22



Note(s):

Articles are classified by their year of publication. Whole counting is used.

Source(s):

National Center for Science and Engineering Statistics; Science-Metrix (Elsevier); Scopus abstract and citation database, accessed August 2025.

Science and Engineering Indicators

Open-Source Software Data and Methodology

Science and engineering activity is increasingly embedded in and documented through software tools that are freely available to use, reuse, and modify. Open-source software (OSS) allows free access to modifiable digital tools that are used for work and leisure and constitutes an intangible investment in knowledge-based public goods. Indicators of its creation and use illustrate aspects of innovation and technology diffusion that enhance science and technology indicators.

These indicators were created using data collected from GitHub, a platform that allows software developers to create, store, modify, and share software. The GitHub data are used in this report for three reasons:

- GitHub's focus on modification and sharing provides the opportunity to collect metadata about software repositories and its creators.
- GitHub is currently very broadly used with over 420 million repositories (GitHub 2026a).
- Alternative sources of data for federal contributions, such as code.gov, have been discontinued.

The *Indicators 2026* report Translation to Impact: U.S. and Global Science, Technology, and Innovation Output provides indicators on GitHub repositories as the unit of observation. A software developer can contribute code to a project on GitHub by performing a "git commit" (GitHub 2026b), and these contributions to an open-source licensed project in a repository in a given year are a measure of innovation activity. For this analysis, OSS is computer software that (1) makes its source code available with a license; (2) provides, via the copyright holder, the rights to study, change, and distribute the software to anyone and for any purpose; and (3) is identified by the Open Source Initiative (OSI) (<https://opensource.org/licenses>). When available, data identifying the country or economic sector of the developer making the contribution are an indicator of the source of this innovation activity.

Data

While the sharing of computer software has been around since the 1950s, the launching of the GitHub platform in 2008 provided a collectable source of metadata that could be harvested and analyzed. Repositories with machine-detectable, OSI-approved licenses were identified, and public, active (non-archived) repositories that are not forks or mirrors of other repositories were collected using the GHOST.jl package (Santiago Calderon 2020). The information collected for each repository includes creation date, description of the repository, primary language, user-selected topics, and a list of all developers that appear in the commit data for the identified repositories were compiled and a set of user data was collected for each developer, including GitHub account creation date, email address, location, bio, company, and website, if provided by the user.

A likely country of residence was then identified for each user based on available self-identified metadata using the *diverstidy* and *tidyorgs* packages (Kramer 2021a, 2021b). The initial implementation relied on only two fields (location and email domain), and returned a single inferred country per contributor. This was subsequently expanded so that social accounts and the user bio can inform the country assignment, and that multiple countries can be identified for each user. An economic sector (academic, business, government, nonprofit) was also identified for developers based on the institution name in the user bio, affiliation, or email address.

Contributions to new repositories are an indicator of innovation. Both fractional counting and whole counting methods were employed for different analytical purposes. In fractional counts, each repository's credit is divided equally across the number of developers that contributed to it in the first year after its creation, and each developer's share is further divided across that developer's associated countries. If a developer is affiliated with two countries, each country receives half of that developer's share. This ensures that the total sum of all countries' contributions matches the total number of unique repositories. In whole counts, credit for each repository is counted one full time for each institution where at least one affiliate or employee contributed. Whole counting measures instances of collaboration and the contributions of particular institutions, but whole counts should not be aggregated because repositories codeveloped by multiple institutions would be double counted.

Limitations

The data collection aims to provide a census of all OSS projects on GitHub, but although GitHub is a large platform and is frequently used by developers for storing and distributing OSS, not all OSS projects are present on GitHub (Korkmaz et al. 2024). Furthermore, while there are many established OSS licenses, some valid OSS licenses may use nonstandard language that were not recognized by the GHOST.jl tool during data collection. Both of these issues may have resulted in an overall undercount of OSS projects.

A substantive caveat about the use of these data as indicators is that the GitHub platform does not maintain complete information about all developers. Location and sector analyses rely on location and affiliation data that GitHub users voluntarily supply, and the coverage of country and sector information is affected by the typical limitations of user-supplied data. Country could not be identified for 67% of GitHub user profiles; within the subset of U.S.-based GitHub users, sector could not be identified for 68% of profiles (Westat 2026). As a result, data tables' geographic location and institutional affiliations are based only on the repositories with usable information. Data on the location of contributors is missing for more than half of the repositories (64%). Location information was available for between 32% and 52% of the repositories in each year from 2009 to 2024, with location information available for 36% of repositories in 2024 (Table STRN-33). In their Innovation Graph, which uses user Internet Protocol data, GitHub research finds a similar distribution of GitHub repositories to those presented in the *Indicators 2026* report Translation to Impact: U.S. and Global Science, Technology, and Innovation Output, with a large share of developers from the United States and India (<https://github.com/github/innovationgraph/blob/main/docs/datasheet.md>). Data on the institutional affiliation of contributors is missing for 84% of the repositories. This incomplete coverage may affect the reliability of location and sector analyses, which should be regarded as experimental at this time.

PitchBook Venture Capital Data and Methodology

The venture capital (VC) data used in this report highlight trends in VC investment and venture-backed companies, which are indicators of innovation and entrepreneurship. VC investors invest in companies with products that are high risk but that they believe have a significant likelihood of generating large returns if successful. Although VC investment is a small share of overall investments, VC-funded companies often have outsized influence on the innovation market. Data on U.S. and global VC investment trends can be viewed as leading indicators of innovation activity. The VC data used in the *Indicators 2026* report Translation to Impact: U.S. and Global Science, Technology, and Innovation Output were from the proprietary PitchBook Venture Capital and Private Equity Database (<https://pitchbook.com/>).

PitchBook data are gathered through a proprietary process compiling relevant information from news articles, regulatory filings, press releases, and websites. Some of the information gathering and verification include direct communication with firms, investors, and other relevant people.

Data

PitchBook is compiled and maintained for use by VC firms, private equity firms, investment banks, and limited partners to analyze, research, and source deals. It was not intended to be a statistical data source on trends in VC investment over time. Therefore, while the intent is to compile information and statistics on as many relevant firms and investment deals as possible, information about the overall representativeness is not available (PitchBook 2026a). PitchBook advertises itself as a comprehensive resource for investors, but the specific methodologies used to substantiate this claim are not publicly documented (Pitchbook 2026b).

VC deals presented at the country level are classified based on the location of the company headquarters. The search terms used are Deal Type: All VC Stages, Ownership Status: All Ownership Statuses, Backing Status: VC-backed, and Business Status: All Business Statuses.

PitchBook uses multiple methods for classifying the industry or market served by a firm. The most granular classification is the Primary Industry Code (PIC), which is a customized adaptation by PitchBook of the Global Industrial Classification Standard and includes over 200 unique industries. The critical and emerging technology (CET) classifications shown in Figure TRN-33 are aggregates of multiple PICs, as shown in [Table SATRN-3](#). For continuity, prior classifications presented in the *Indicators 2024* report Invention, Knowledge Transfer, and Innovation are also shown in [Table STRN-38](#), along with their classification crosswalk in [Table SATRN-3](#).

Table SATRN-3. Crosswalk of PitchBook industry codes, critical and emerging technology group codes, and industry codes

(Categories)

Primary industry group	Primary industry code	CET group	Industry
Agriculture	Animal Husbandry	not_applicable	Agriculture & Food
Agriculture	Aquaculture	not_applicable	Agriculture & Food
Agriculture	Cultivation	not_applicable	Agriculture & Food
Agriculture	Horticulture	not_applicable	Agriculture & Food
Agriculture	Other Agriculture	not_applicable	Agriculture & Food
Apparel and Accessories	Accessories	not_applicable	Consumer Goods & Services
Apparel and Accessories	Clothing	not_applicable	Consumer Goods & Services
Apparel and Accessories	Footwear	not_applicable	Consumer Goods & Services
Apparel and Accessories	Luxury Goods	not_applicable	Consumer Goods & Services
Apparel and Accessories	Other Apparel	not_applicable	Consumer Goods & Services
Capital Markets/Institutions	Asset Management	not_applicable	Commercial Services
Capital Markets/Institutions	Brokerage	not_applicable	Financial Services
Capital Markets/Institutions	Investment Banks	not_applicable	Financial Services
Capital Markets/Institutions	Other Capital Markets/Institutions	not_applicable	Financial Services
Capital Markets/Institutions	Private Equity	not_applicable	Financial Services
Chemicals and Gases	Agricultural Chemicals	materials_science	Agriculture & Food
Chemicals and Gases	Commodity Chemicals	materials_science	Industrial Products
Chemicals and Gases	Industrial Chemicals	materials_science	Industrial Products
Chemicals and Gases	Multi-line Chemicals	materials_science	Industrial Products
Chemicals and Gases	Other Chemicals and Gases	materials_science	Industrial Products
Chemicals and Gases	Specialty Chemicals	materials_science	Industrial Products
Commercial Banks	International Banks	not_applicable	Financial Services
Commercial Banks	National Banks	not_applicable	Financial Services
Commercial Banks	Other Commercial Banks	not_applicable	Financial Services
Commercial Banks	Regional Banks	not_applicable	Financial Services
Commercial Banks	Thrifts and Mortgage Finance	not_applicable	Financial Services
Commercial Products	Aerospace and Defense	not_applicable	Transportation & Defense
Commercial Products	Building Products	not_applicable	Industrial Products
Commercial Products	Distributors/Wholesale	not_applicable	Commercial Services
Commercial Products	Electrical Equipment	not_applicable	Industrial Products
Commercial Products	Industrial Supplies and Parts	not_applicable	Industrial Products
Commercial Products	Machinery (B2B)	not_applicable	Industrial Products
Commercial Products	Other Commercial Products	not_applicable	Industrial Products
Commercial Services	Accounting, Audit and Tax Services (B2B)	not_applicable	Commercial Services
Commercial Services	BPO/Outsource Services	not_applicable	Commercial Services
Commercial Services	Construction and Engineering	not_applicable	Commercial Services
Commercial Services	Consulting Services (B2B)	not_applicable	Commercial Services
Commercial Services	Education and Training Services (B2B)	not_applicable	Commercial Services
Commercial Services	Environmental Services (B2B)	not_applicable	Commercial Services
Commercial Services	Human Capital Services	not_applicable	Commercial Services
Commercial Services	Legal Services (B2B)	not_applicable	Commercial Services
Commercial Services	Logistics	not_applicable	Commercial Services
Commercial Services	Media and Information Services (B2B)	not_applicable	Information
Commercial Services	Office Services (B2B)	not_applicable	Commercial Services
Commercial Services	Other Commercial Services	not_applicable	Commercial Services
Commercial Services	Printing Services (B2B)	not_applicable	Commercial Services
Commercial Services	Security Services (B2B)	not_applicable	Commercial Services
Commercial Transportation	Air	not_applicable	Transportation & Defense
Commercial Transportation	Infrastructure	not_applicable	Transportation & Defense
Commercial Transportation	Marine	not_applicable	Transportation & Defense
Commercial Transportation	Other Transportation	not_applicable	Transportation & Defense
Commercial Transportation	Rail	not_applicable	Transportation & Defense
Commercial Transportation	Road	not_applicable	Transportation & Defense

Table SATRN-3. Crosswalk of PitchBook industry codes, critical and emerging technology group codes, and industry codes

(Categories)

Primary industry group	Primary industry code	CET group	Industry
Communications and Networking	Cable Service Providers	communications	Information
Communications and Networking	Connectivity Products	communications	IT Hardware
Communications and Networking	Fiberoptic Equipment	communications	IT Hardware
Communications and Networking	Internet Service Providers	communications	Information
Communications and Networking	Other Communications and Networking	communications	Information
Communications and Networking	Telecommunications Service Providers	communications	Information
Communications and Networking	Wireless Communications Equipment	communications	Information
Communications and Networking	Wireless Service Providers	communications	Information
Computer Hardware	Computers, Parts and Peripherals	computer_hardware	IT Hardware
Computer Hardware	Electronic Components	computer_hardware	IT Hardware
Computer Hardware	Electronic Equipment and Instruments	computer_hardware	IT Hardware
Computer Hardware	Office Electronics	computer_hardware	IT Hardware
Computer Hardware	Other Hardware	computer_hardware	IT Hardware
Computer Hardware	Storage (IT)	computer_hardware	IT Hardware
Construction (Non-Wood)	Raw Materials (Non-Wood)	not_applicable	Industrial Products
Consumer Durables	Business Equipment and Supplies	not_applicable	Commercial Services
Consumer Durables	Electronics (B2C)	not_applicable	Consumer Goods & Services
Consumer Durables	Home Furnishings	not_applicable	Consumer Goods & Services
Consumer Durables	Household Appliances	not_applicable	Consumer Goods & Services
Consumer Durables	Other Consumer Durables	not_applicable	Consumer Goods & Services
Consumer Durables	Recreational Goods	not_applicable	Consumer Goods & Services
Consumer Non-Durables	Beverages	not_applicable	Agriculture & Food
Consumer Non-Durables	Food Products	not_applicable	Agriculture & Food
Consumer Non-Durables	Household Products	not_applicable	Consumer Goods & Services
Consumer Non-Durables	Other Consumer Non-Durables	not_applicable	Consumer Goods & Services
Consumer Non-Durables	Personal Products	not_applicable	Consumer Goods & Services
Containers and Packaging	Metal Containers and Packaging	not_applicable	Industrial Products
Containers and Packaging	Other Containers and Packaging	not_applicable	Industrial Products
Containers and Packaging	Paper Containers and Packaging	not_applicable	Industrial Products
Containers and Packaging	Plastic Containers and Packaging	not_applicable	Industrial Products
Containers and Packaging	Wood Containers and Packaging	not_applicable	Industrial Products
Energy Equipment	Alternative Energy Equipment	energy	Energy
Energy Equipment	Coal and Consumable Fuels Equipment	energy	Energy
Energy Equipment	Oil and Gas Equipment	energy	Energy
Energy Equipment	Other Equipment	energy	Industrial Products
Energy Services	Energy Infrastructure	energy	Energy
Energy Services	Energy Marketing	energy	Energy
Energy Services	Energy Storage	energy	Energy
Energy Services	Energy Traders and Brokers	energy	Energy
Energy Services	Energy Transportation	energy	Energy
Energy Services	Other Energy Services	energy	Energy
Exploration, Production and Refining	Energy Exploration	energy	Energy
Exploration, Production and Refining	Energy Production	energy	Energy
Exploration, Production and Refining	Energy Refining	energy	Energy
Forestry	Forestry Development/Harvesting	not_applicable	Agriculture & Food
Forestry	Forestry Processing	not_applicable	Agriculture & Food
Forestry	Other Forestry	not_applicable	Agriculture & Food
Forestry	Paper/Soft Products	not_applicable	Consumer Goods & Services
Forestry	Wood/Hard Products	not_applicable	Industrial Products
Healthcare Devices and Supplies	Diagnostic Equipment	not_applicable	Biomedical
Healthcare Devices and Supplies	Medical Supplies	not_applicable	Healthcare
Healthcare Devices and Supplies	Monitoring Equipment	not_applicable	Healthcare
Healthcare Devices and Supplies	Other Devices and Supplies	not_applicable	Healthcare

Table SATRN-3. Crosswalk of PitchBook industry codes, critical and emerging technology group codes, and industry codes

(Categories)

Primary industry group	Primary industry code	CET group	Industry
Healthcare Devices and Supplies	Surgical Devices	not_applicable	Biomedical
Healthcare Devices and Supplies	Therapeutic Devices	not_applicable	Healthcare
Healthcare Services	Clinics/Outpatient Services	not_applicable	Healthcare
Healthcare Services	Distributors (Healthcare)	not_applicable	Healthcare
Healthcare Services	Elder and Disabled Care	not_applicable	Healthcare
Healthcare Services	Hospitals/Inpatient Services	not_applicable	Healthcare
Healthcare Services	Laboratory Services (Healthcare)	not_applicable	Healthcare
Healthcare Services	Managed Care	not_applicable	Healthcare
Healthcare Services	Other Healthcare Services	not_applicable	Healthcare
Healthcare Services	Practice Management (Healthcare)	not_applicable	Healthcare
Healthcare Technology Systems	Decision/Risk Analysis	not_applicable	Software
Healthcare Technology Systems	Enterprise Systems (Healthcare)	not_applicable	Software
Healthcare Technology Systems	Medical Records Systems	not_applicable	Healthcare
Healthcare Technology Systems	Other Healthcare Technology Systems	not_applicable	Healthcare
Healthcare Technology Systems	Outcome Management (Healthcare)	not_applicable	Healthcare
Insurance	Automotive Insurance	not_applicable	Financial Services
Insurance	Commercial/Professional Insurance	not_applicable	Financial Services
Insurance	Insurance Brokers	not_applicable	Financial Services
Insurance	Life and Health Insurance	not_applicable	Financial Services
Insurance	Multi-line Insurance	not_applicable	Financial Services
Insurance	Other Insurance	not_applicable	Financial Services
Insurance	Property and Casualty Insurance	not_applicable	Financial Services
Insurance	Re-Insurance	not_applicable	Financial Services
IT Services	IT Consulting and Outsourcing	communications	Commercial Services
IT Services	Other IT Services	communications	Commercial Services
IT Services	Systems and Information Management	communications	Commercial Services
Media	Broadcasting, Radio and Television	not_applicable	Information
Media	Information Services (B2C)	not_applicable	Information
Media	Movies, Music and Entertainment	not_applicable	Information
Media	Other Media	not_applicable	Information
Media	Publishing	not_applicable	Information
Media	Social Content	not_applicable	Information
Metals, Minerals and Mining	Aluminum Mining	not_applicable	Industrial Products
Metals, Minerals and Mining	Coal Mining	not_applicable	Energy
Metals, Minerals and Mining	Gold Mining	not_applicable	Industrial Products
Metals, Minerals and Mining	Iron and Steel Mining	not_applicable	Industrial Products
Metals, Minerals and Mining	Multi-line Mining	not_applicable	Industrial Products
Metals, Minerals and Mining	Other Metals, Minerals and Mining	not_applicable	Industrial Products
Metals, Minerals and Mining	Precious Metals and Minerals Mining	not_applicable	Industrial Products
Other Business Products and Services	Buildings and Property	not_applicable	Commercial Services
Other Business Products and Services	Conglomerates	not_applicable	Other
Other Business Products and Services	Government	not_applicable	Other
Other Business Products and Services	Other Business Products and Services	not_applicable	Commercial Services
Other Consumer Products and Services	Other Consumer Products and Services	not_applicable	Consumer Goods & Services
Other Energy	Other Energy	energy	Energy
Other Financial Services	Consumer Finance	not_applicable	Financial Services
Other Financial Services	Holding Companies	not_applicable	Other
Other Financial Services	Other Financial Services	not_applicable	Financial Services
Other Financial Services	Real Estate Investment Trusts (REITs)	not_applicable	Financial Services
Other Financial Services	Special Purpose Acquisition Company (SPAC)	not_applicable	Other
Other Financial Services	Specialized Finance	not_applicable	Financial Services
Other Healthcare	Other Healthcare	not_applicable	Healthcare
Other Information Technology	Other Information Technology	communications	Commercial Services

Table SATRN-3. Crosswalk of PitchBook industry codes, critical and emerging technology group codes, and industry codes

(Categories)

Primary industry group	Primary industry code	CET group	Industry
Other Materials	Other Materials	materials_science	Industrial Products
Pharmaceuticals and Biotechnology	Biotechnology	biotechnology	Biomedical
Pharmaceuticals and Biotechnology	Discovery Tools (Healthcare)	biotechnology	Biomedical
Pharmaceuticals and Biotechnology	Drug Delivery	biotechnology	Biomedical
Pharmaceuticals and Biotechnology	Drug Discovery	biotechnology	Biomedical
Pharmaceuticals and Biotechnology	Other Pharmaceuticals and Biotechnology	biotechnology	Biomedical
Pharmaceuticals and Biotechnology	Pharmaceuticals	biotechnology	Biomedical
Restaurants, Hotels and Leisure	Casinos and Gaming	not_applicable	Consumer Goods & Services
Restaurants, Hotels and Leisure	Cruise Lines	not_applicable	Consumer Goods & Services
Restaurants, Hotels and Leisure	Hotels and Resorts	not_applicable	Consumer Goods & Services
Restaurants, Hotels and Leisure	Leisure Facilities	not_applicable	Consumer Goods & Services
Restaurants, Hotels and Leisure	Other Restaurants, Hotels and Leisure	not_applicable	Consumer Goods & Services
Restaurants, Hotels and Leisure	Restaurants and Bars	not_applicable	Consumer Goods & Services
Retail	Catalog Retail	not_applicable	Consumer Goods & Services
Retail	Department Stores	not_applicable	Consumer Goods & Services
Retail	Distributors/Wholesale (B2C)	not_applicable	Consumer Goods & Services
Retail	General Merchandise Stores	not_applicable	Consumer Goods & Services
Retail	Internet Retail	not_applicable	Consumer Goods & Services
Retail	Other Retail	not_applicable	Consumer Goods & Services
Retail	Specialty Retail	not_applicable	Consumer Goods & Services
Semiconductors	Application Specific Semiconductors	computer_hardware	IT Hardware
Semiconductors	General Purpose Semiconductors	computer_hardware	IT Hardware
Semiconductors	Other Semiconductors	computer_hardware	IT Hardware
Semiconductors	Production (Semiconductors)	computer_hardware	IT Hardware
Services (Non-Financial)	Accounting, Audit and Tax Services (B2C)	not_applicable	Consumer Goods & Services
Services (Non-Financial)	Educational and Training Services (B2C)	not_applicable	Consumer Goods & Services
Services (Non-Financial)	Legal Services (B2C)	not_applicable	Consumer Goods & Services
Services (Non-Financial)	Other Services (B2C Non-Financial)	not_applicable	Commercial Services
Services (Non-Financial)	Real Estate Services (B2C)	not_applicable	Consumer Goods & Services
Software	Application Software	computer_software	Software
Software	Automation/Workflow Software	computer_software	Software
Software	Business/Productivity Software	computer_software	Software
Software	Communication Software	computer_software	Software
Software	Database Software	computer_software	Software
Software	Educational Software	computer_software	Software
Software	Entertainment Software	computer_software	Software
Software	Financial Software	computer_software	Software
Software	Internet Software	computer_software	Software
Software	Multimedia and Design Software	computer_software	Software
Software	Network Management Software	computer_software	Software
Software	Operating Systems Software	computer_software	Software
Software	Other Software	computer_software	Software
Software	Social/Platform Software	computer_software	Software
Software	Software Development Applications	computer_software	Software
Software	Vertical Market Software	computer_software	Software
Textiles	Animal Textiles	not_applicable	Agriculture & Food
Textiles	Other Textiles	not_applicable	Industrial Products
Textiles	Plant Textiles	not_applicable	Industrial Products
Textiles	Synthetic Textiles	not_applicable	Industrial Products
Transportation	Air	not_applicable	Transportation & Defense
Transportation	Automotive	not_applicable	Transportation & Defense
Transportation	Marine	not_applicable	Transportation & Defense
Transportation	Other Transportation	not_applicable	Transportation & Defense

Table SATRN-3. Crosswalk of PitchBook industry codes, critical and emerging technology group codes, and industry codes

(Categories)

Primary industry group	Primary industry code	CET group	Industry
Transportation	Rail	not_applicable	Transportation & Defense
Utilities	Electric Utilities	not_applicable	Energy
Utilities	Gas Utilities	not_applicable	Energy
Utilities	Multi-Utilities	not_applicable	Energy
Utilities	Other Utilities	not_applicable	Energy
Utilities	Water Utilities	not_applicable	Other

B2B = business to business; B2C = business to consumer; CET = critical and emerging technology; IT = information technology.

Source(s):

PitchBook, venture capital and private equity database, special tabulations, accessed May 2025.

Science and Engineering Indicators

Limitations

PitchBook's data are compiled and maintained as a resource for investors, whose priority is often accurate information on particular companies, deals, and other investors—rather than aggregate indicators on the entire data set. For this reason, some of the decisions or company policy behind their collection may be misaligned with standard practices for large-scale administrative data sets.

PitchBook prioritizes international coverage of firms located in the following regions: North America, Europe, Israel, Asia Pacific region, Middle East, North Africa, and Turkey (PitchBook 2025). PitchBook coverage by country may be incomplete in countries not included in a region on this list.

Key to Acronyms and Abbreviations

CET: critical and emerging technology

HERD: Higher Education Research and Development Survey

PIC: Primary Industry Code

R&D: research and development

STATT: Statistics Access for Technology Transfer Database

TTO: technology transfer office

USPTO: Patent and Trademark Office

VC: venture capital

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