



U.S. Startup Company Formation and Venture Capital Funding Trends 2004 to 2017

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Executive Summary

- For at least the last 15 years, accelerating with the Obama Administration, the U.S. patent system has been systematically marginalized for all but the largest corporations.
- Cutting edge startups and entrepreneurs – and their investors – have long been responsible for most of the real breakthrough inventions and technologies needed for economic growth, improved quality of life, increased productivity and national security.
- Despite superficial appearances that U.S. startups and their investors remain vibrant, a closer look reveals major declines in the technologies that drive systemic growth in the economy and advance U.S. competitiveness.
- Venture capital investment in the most advanced technologies has declined while investment in lower risk commercial activities has increased disproportionately.
- Restoration of our patent system is essential if our country is to maintain its current prominence as the world leader in technology and applied science.

Economic Realities Facing Our Country

- Certain technology areas, such as life sciences, communications networking, advanced manufacturing, materials science, semiconductors, medical devices and others disciplines are strategically critical to our country
 - They underpin foundations of economic growth, both in U.S. and globally
 - They improve the quality of life for U.S. citizens
 - They are essential to national security
 - U.S. is in a worldwide race to remain dominant in the strategic uses of science and technology
- Continuous formation of startups pursuing strategic technologies is essential to technology leadership and a dynamic economy
 - Startups have long accounted for most of net job growth in U.S.
 - Startups are more effective at developing and implementing new ideas and concepts than are larger and less flexible incumbents.
- Starting a new company requires entrepreneurs and investors with a high tolerance for risk and fertile conditions for invention
 - Competing with large incumbents is risky and many startups fail
 - Breakthrough technologies with long development cycles require vast amounts of investment and promise of satisfactory returns years in the future to justify risk
 - For truly strategic technologies, patent protection against copying by incumbents and others is essential.

Entrepreneurial Inventors Are Crucial to Our Future

- Innovation by large corporations is not the same as the invention that typically happens at venture-funded startups working in more flexible environments
 - American technology giants have been innovative in the design, manufacture and marketing of an impressive array of useful and life-saving products.
 - Large corporations are not as good at pursuing breakthrough ideas that push the limits of creativity and that might challenge their own market positions.
 - Multiple reasons for this related to the management needs of large companies, executive compensation and the momentum of prior successes.
- 200+ years of experience shows that many of the most important breakthrough technologies were made by individual inventors, disruptive entrepreneurs, startup companies and their investors. To name a few iconic examples:
 - Ray Dolby and Dolby Laboratories
 - Chester Carlson and Xerox Corporation
 - Irwin Jacobs, Andrew Viterbi and the other founders of Qualcomm
 - Andy Grove, Gordon Moore and the founders of Intel
 - Bob Swanson, Herb Boyer and Genentech
 - Bill Gates, Paul Allen and the other founders of Microsoft

Systematic Weakening of the U.S. Patent System

- Patent protection for inventors and startups has been gradually eroded for more than fifteen years
 - U.S. Supreme Court has systematically reduced the value and importance of patents in numerous respects.
 - Most problematic was the decision in *EBay v. Merc Exchange* in which the Court made it extremely difficult to obtain an injunction, thus largely eliminating exclusive right for inventors.
 - Other decisions also have had devastating impact on inventors trying to assert patent rights. *E.g.*, *KSR* (obviousness), *Lexmark* (exhaustion), *Prometheus* (patentability), *TC Heartland* (venue), *Octane Fitness* (lawyer fees).
- U.S. Government policies have favored infringers over inventors and patent owners
 - DOJ and FTC sided with infringers in connection with standard setting and other activities.
 - SG amicus briefs to Supreme Court and Federal Circuit rarely argued in favor of patent owners.
 - FTC and DOJ took strong positions against patent owners in administrative proceedings and merger enforcement
- The Leahy-Smith America Invents Act and its implementation has had severe consequences for patent-intensive startups in strategic industries.
 - PTO rules implementing IPRs were blatantly designed to eliminate patents without regard to their merit.
 - IPR implementation has been a gross distortion of the intent of Congress.

Myth of the “Patent Troll” Has Been Devastating

- Hostility toward inventors and entrepreneurs seeking to enforce their patents has been fostered by myth of the “patent troll”
 - Term was invented at Intel to describe an inventor seeking to license his invention.
 - Term was seized by large technology companies and retailers for political purposes.
 - Addressing abuse of the patent litigation process did not require the systematic dismantling of a system of property rights that had served us well for 225 years.
 - Epithet proved effective as a public relations tool to poison the environment for the thousands of inventors and startups that depend on patents for survival.
- The results of this attack on the U.S. patent system has been devastating
 - Many large companies now simply ignore the patent rights of smaller companies using a strategy known as “efficient infringement”.
 - Faced with the prohibitive cost of litigation, made vastly more expensive by the availability of post-grant challenges created by the AIA, many talented inventors have simply stopped creating.
 - The access to capital for companies that depend upon patent protection has declined significantly, as can be seen in VC data over the past decade.
- As the U.S. patent system was being systematically marginalized, other countries have been emulating what the U.S. system was in years past.

Patents Are Critical to Inventors and Their Investors

- Strategically significant technologies have long development cycles requiring years to complete.
- Risks includes technology failure, obsolescence and time value of money.
- Without reliable patent protection, incentives to invest cease to exist.
- Once a revolutionary new idea is proven workable, larger enterprises can swoop in to perfect, scale and market the new technology. Without a workable patent system, this unpunished copying of patented technology creates a powerful disincentive for future entrepreneurs.
- Current environment offers no reasonable expectation that large entrenched players will respect a startup's intellectual property or pay for its use.
- Predictable reaction of incumbents to market entrants and the lack of a functioning patent system has driven investment into companies that do not need patents.

Significant Shift in VC Investments – 2004 to 2017

▪ Exemplary strategic sectors that have **declined** as % of total VC funding

- Core internet networking
- Wireless communications
- Internet software
- Operating system software
- Semiconductors
- Pharmaceuticals
- Drug Discovery
- Surgical Devices
- Medical Supplies

- % of total VC funding in 2004: 20.95%
- % of total VC funding in 2017: 3.22%

▪ Exemplary sectors that have **increased** as % of total VC funding

- Social network platforms
- Software apps
- Consumer apparel and accessories
- Food products
- Restaurants, hotels and leisure
- B2C companies in general
- Consumer finance
- Financial services in general

- % of total VC funding in 2004: 11.4%
- % of total VC funding in 2017: 36.3%

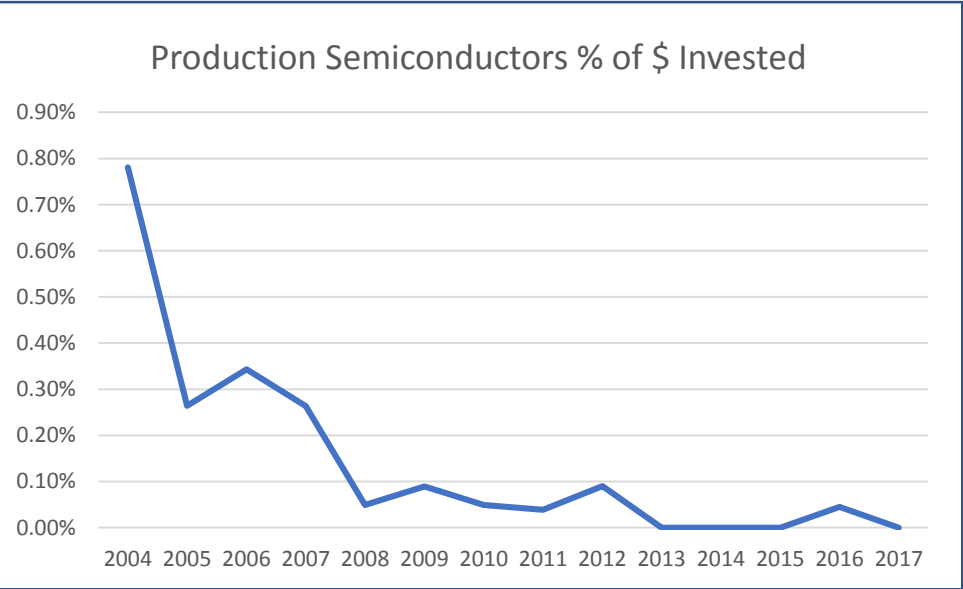
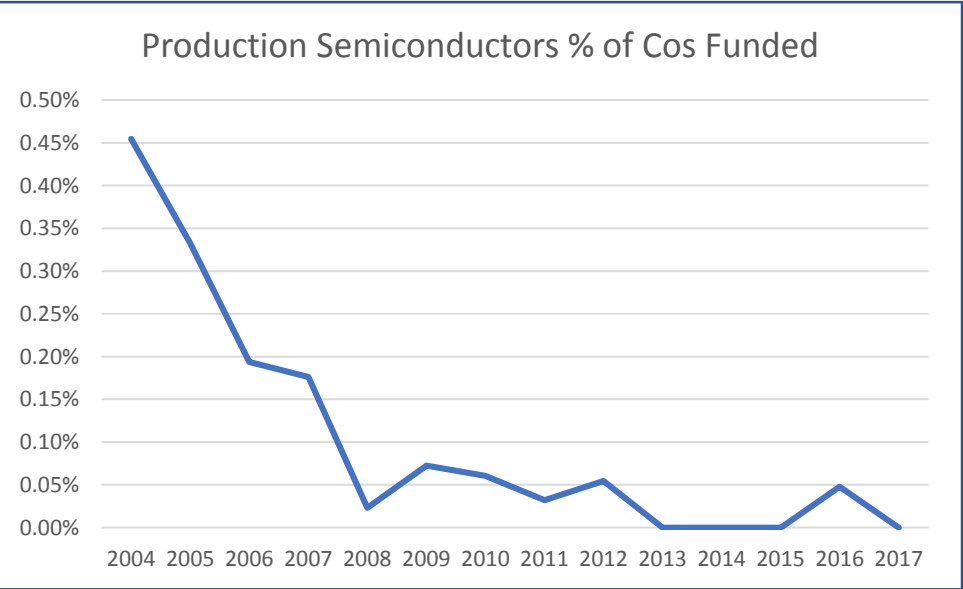
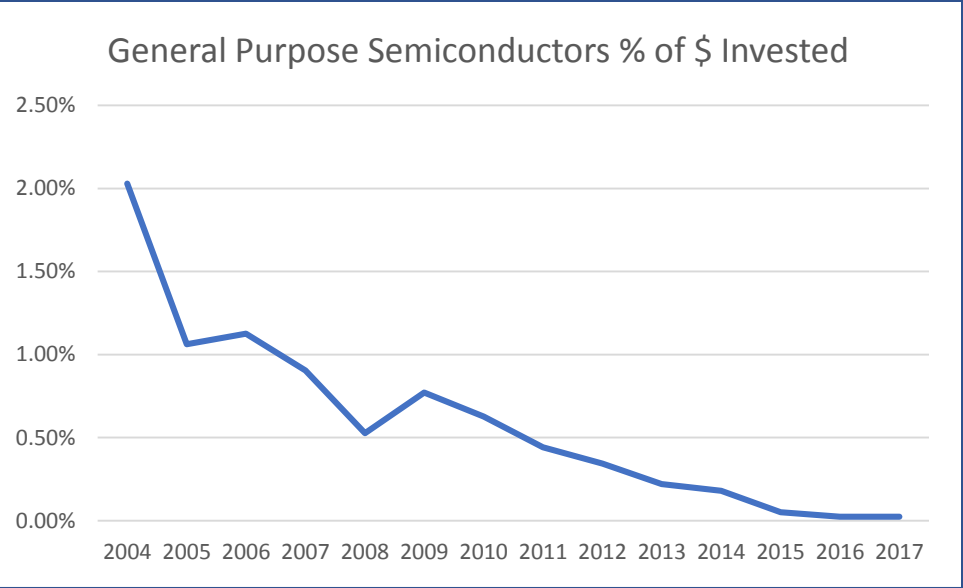
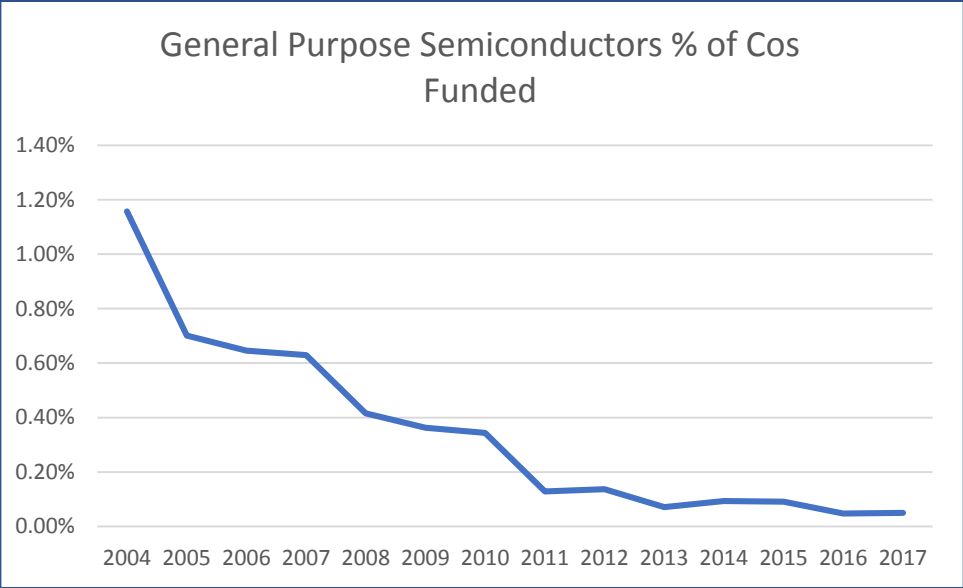
2 – U.S. Startup Investment Study Methodology

U.S. Startup Investment Study Methodology

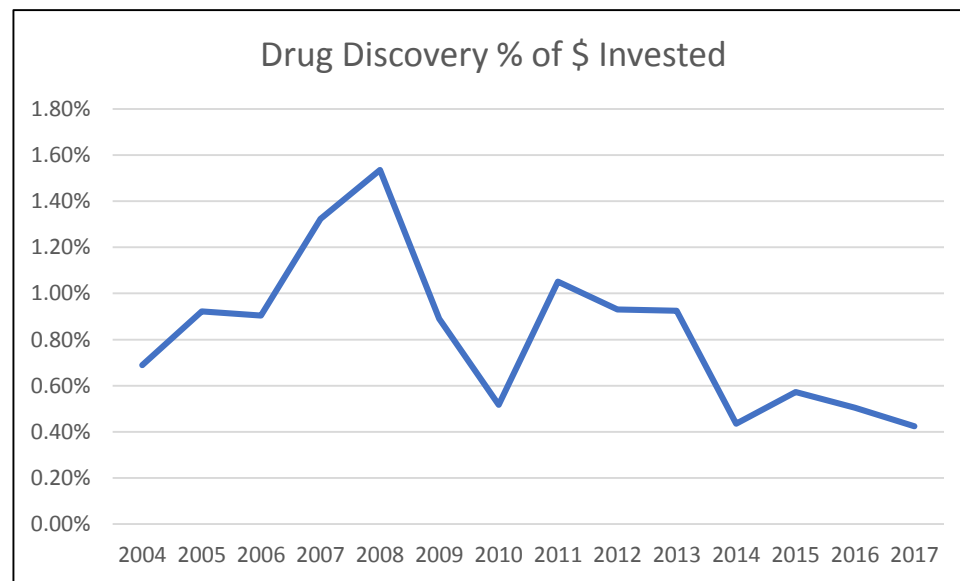
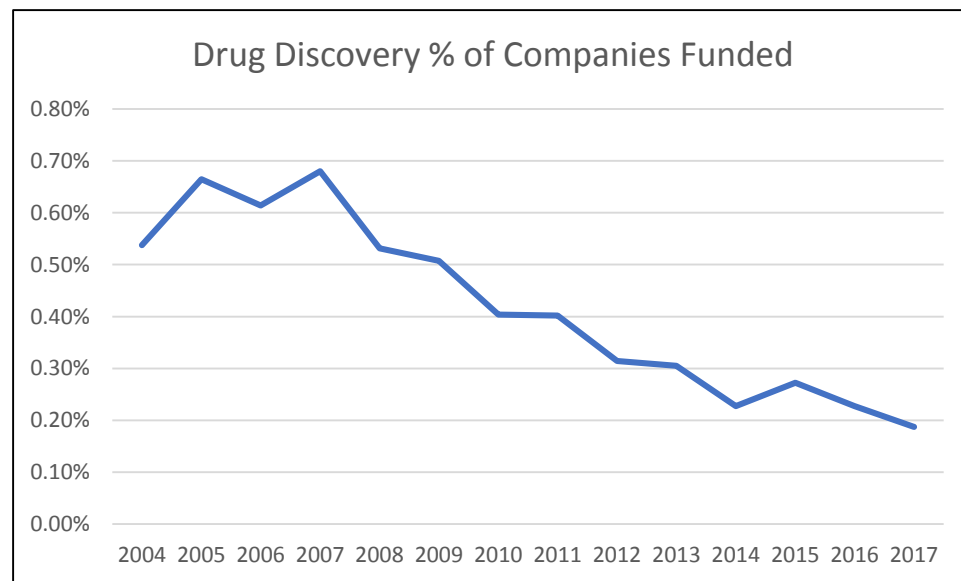
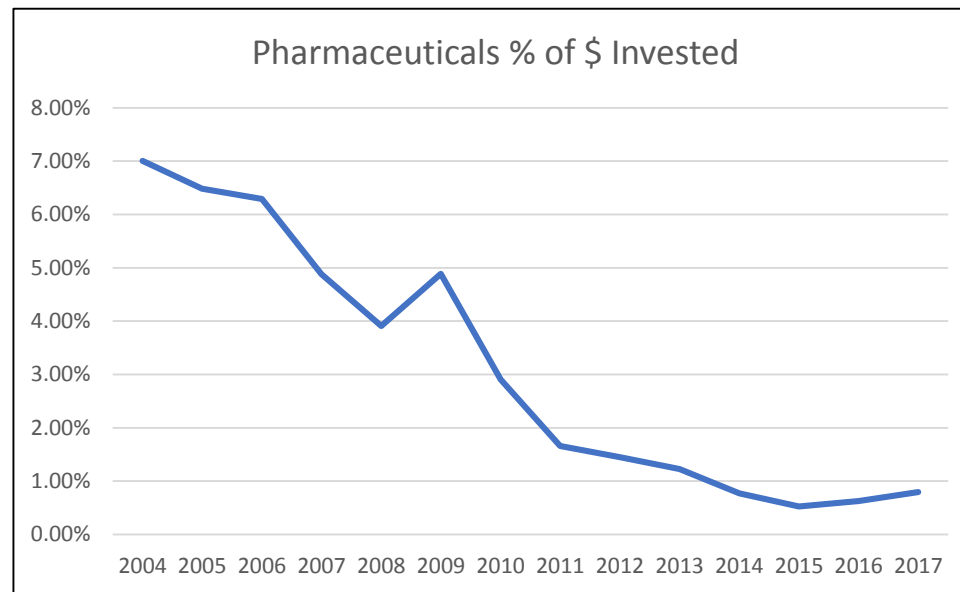
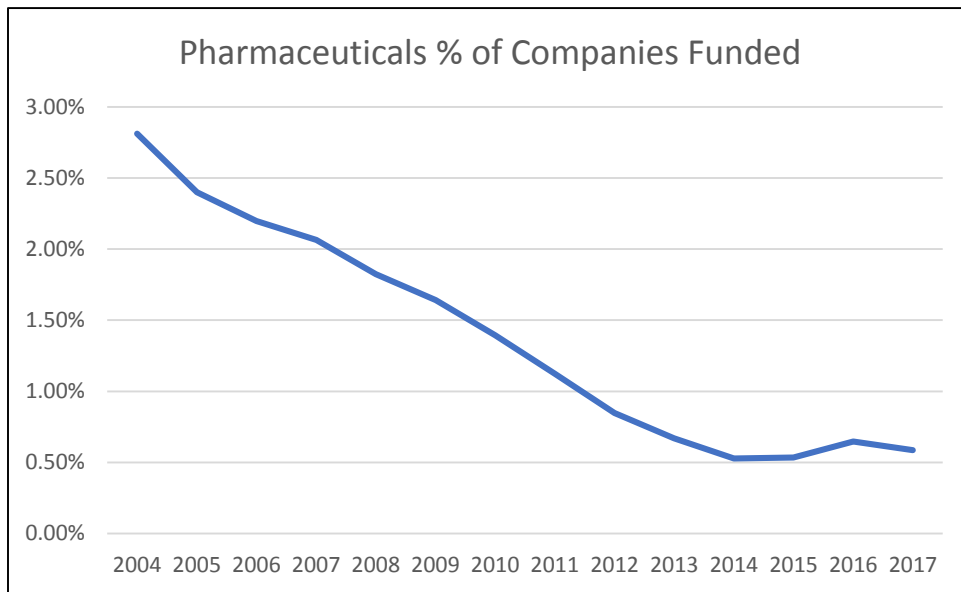
- Objective: Compare U.S. venture capital investment trends in strategically important technology sectors that require patent protection against illustrative sectors that do not require patent protection
 - Data source: PitchBook data provided to National Venture Capital Association
 - Filter down to U.S. investments in designated economic sectors
 - PitchBook data reflects vast majority of all VC investments in the US
 - Study period: 2004 to 2017
- Data was normalized to eliminate effects of inflation and economic growth in study period
 - During the study period total number of companies funded annually increased 3.2 times and total amounts increased 3.9 times
 - The overall population and economy of the world has grown and some inflation has taken place
- Metrics used for this study:
 - % of companies funded in a given economic sector by year = companies in a specified sector funded in a given year divided by total number of companies funded in that year
 - % of dollars invested in a given economic sector by year = dollars invested in the specified sector in a given year divided by the total dollars invested in that year

3 – Decline in Strategic Technology and Life Science Sectors That Require Invention Protections

VC Investment Decline In US Semiconductors

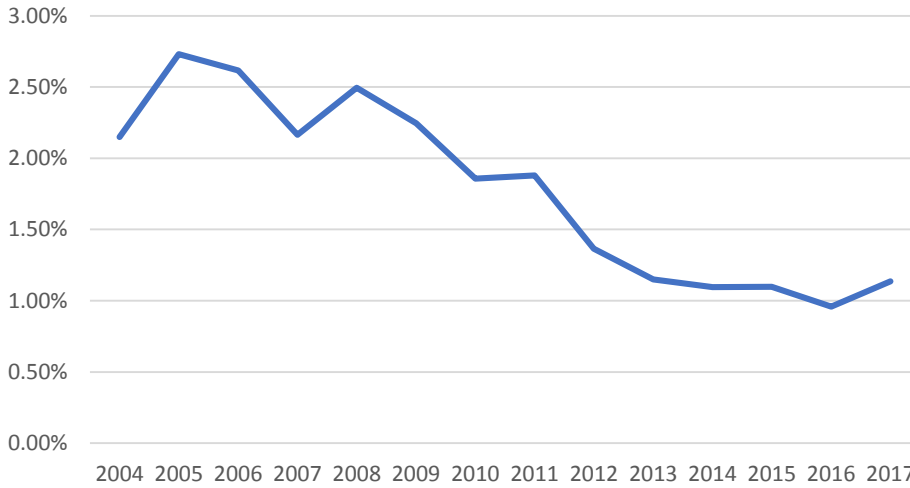


VC Investment Decline In U.S. Biotech & Drugs

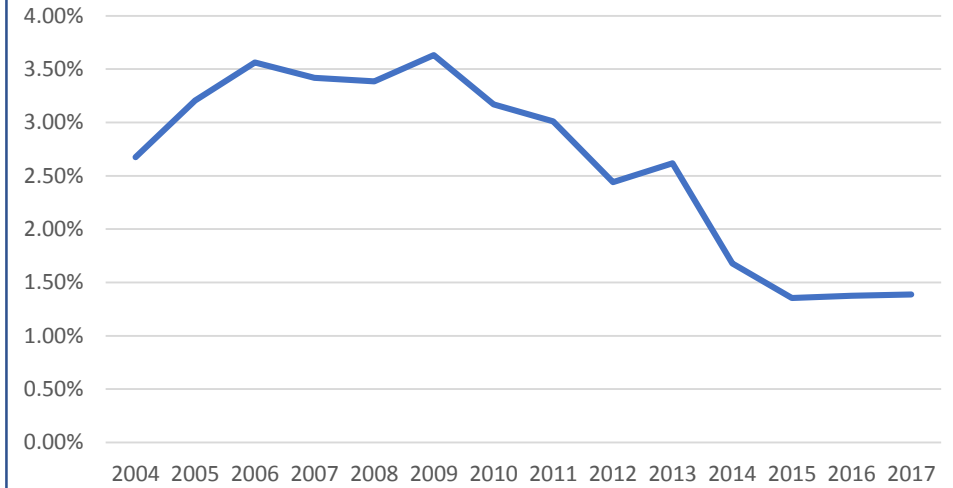


VC Investment Decline In U.S. Med Devices & Supplies

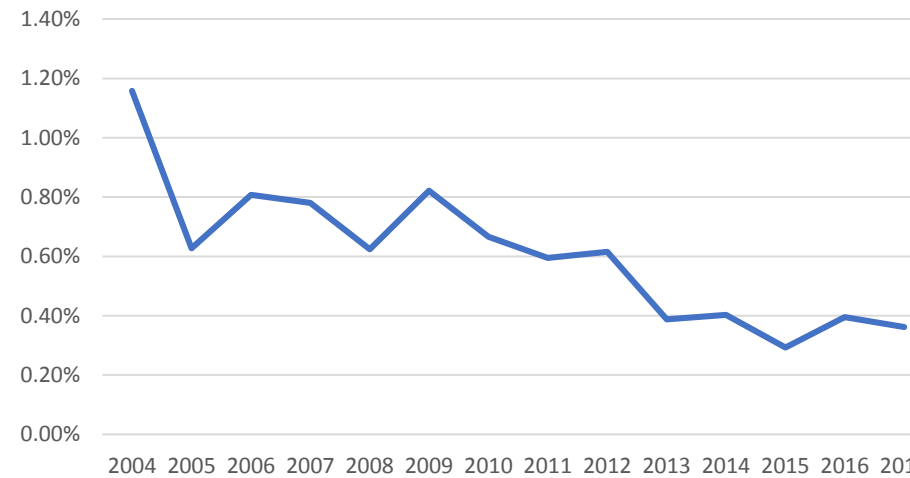
Surgical Device % of Companies Funded



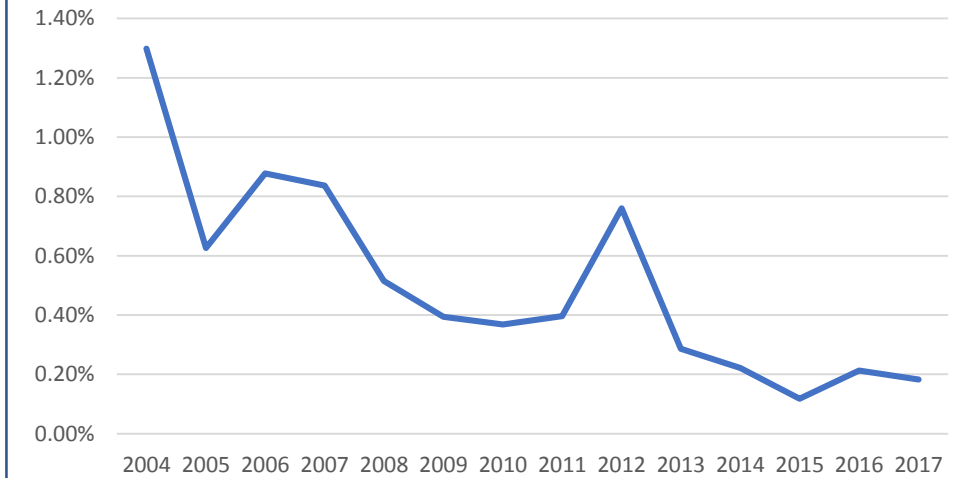
Surgical Device % of \$ Invested



Medical Supplies % of Companies Funded

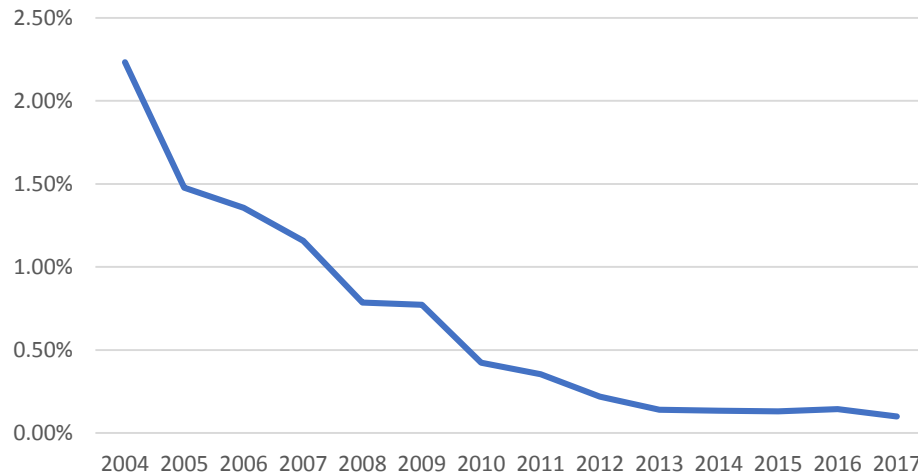


Medical Supplies % of \$ Invested

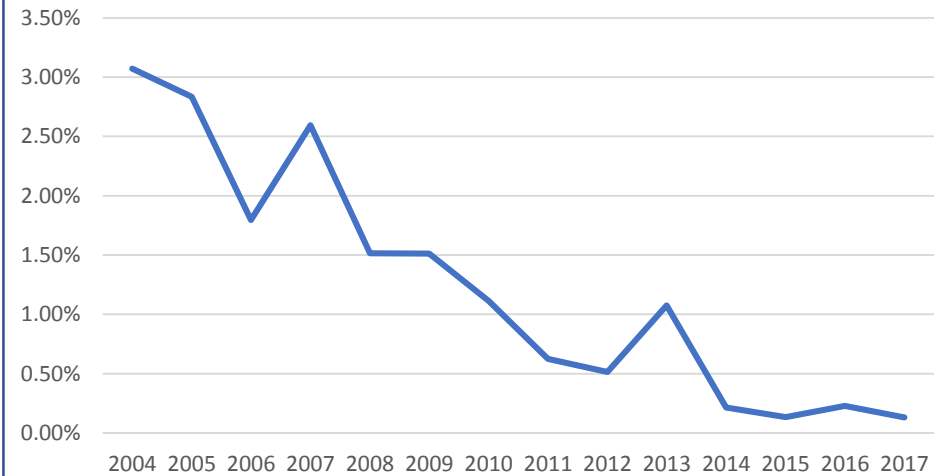


VC Investment Decline In U.S. Networking & Comms

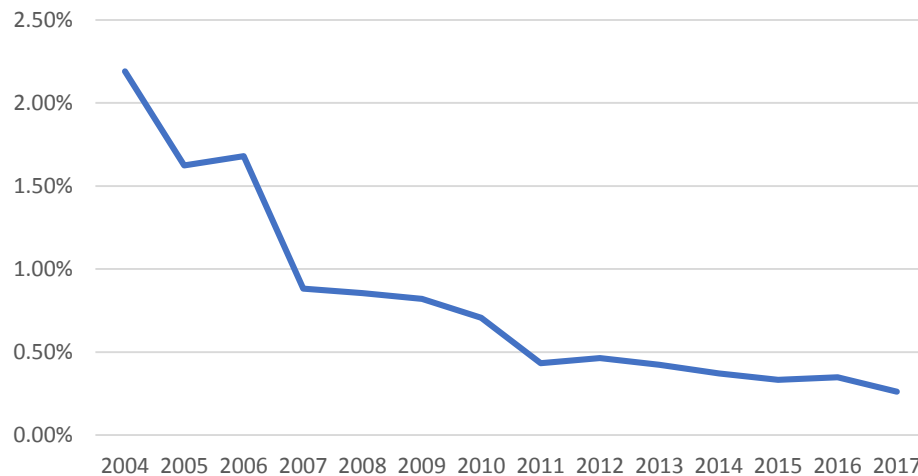
Networking Equipment % of Companies Funded



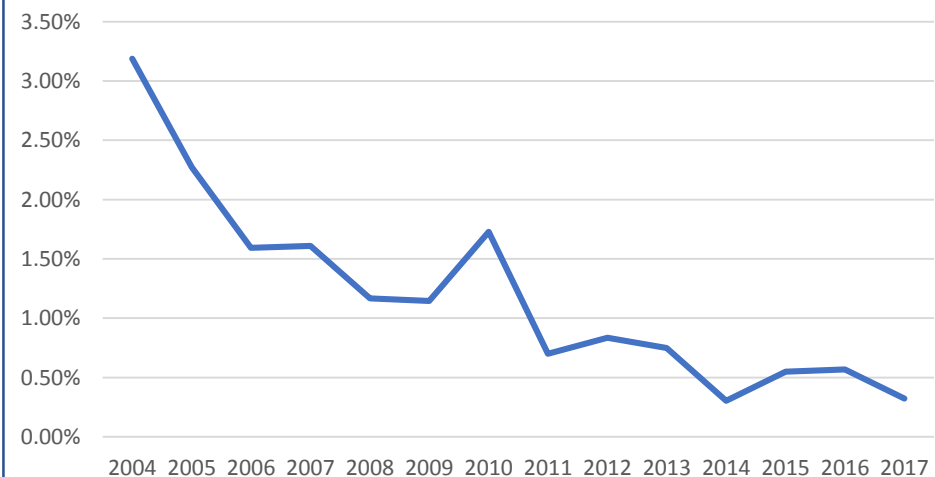
Networking Equipment % of \$ Invested



Wireless Communications Equip % of Cos Funded

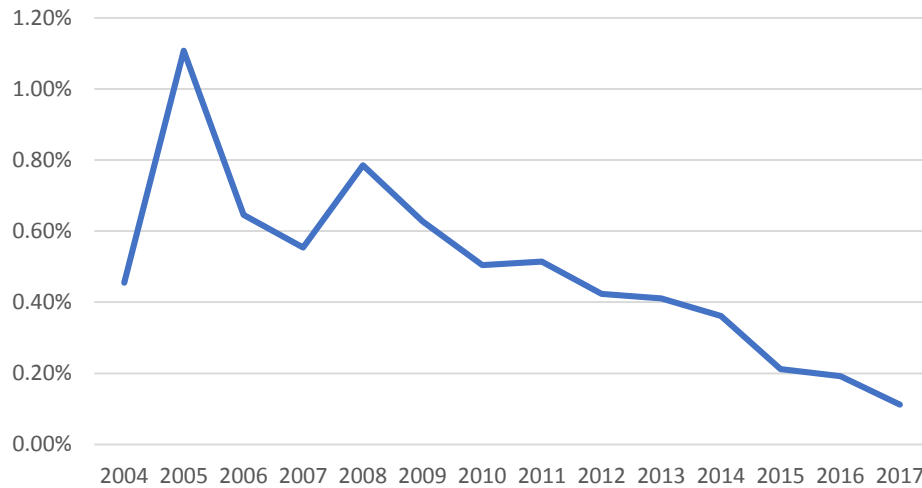


Wireless Communications Equip % of \$ Invested

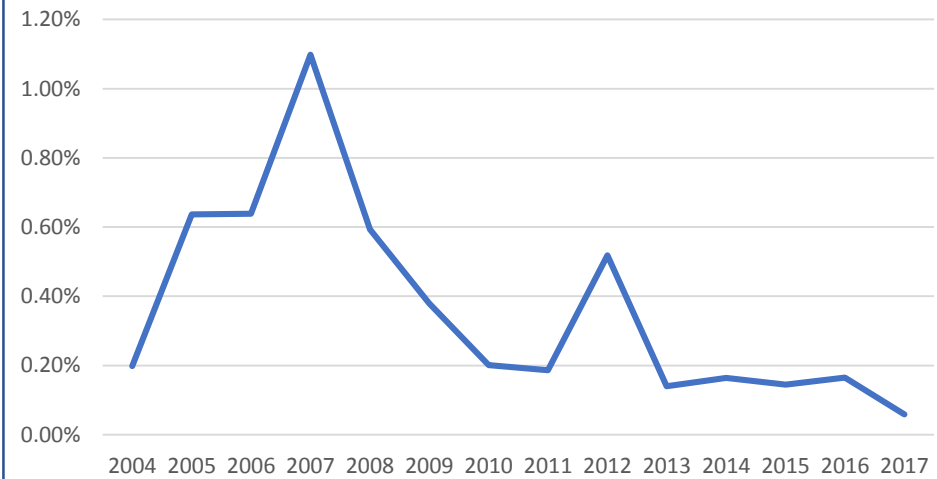


VC Investment Decline In U.S. Strategic Software

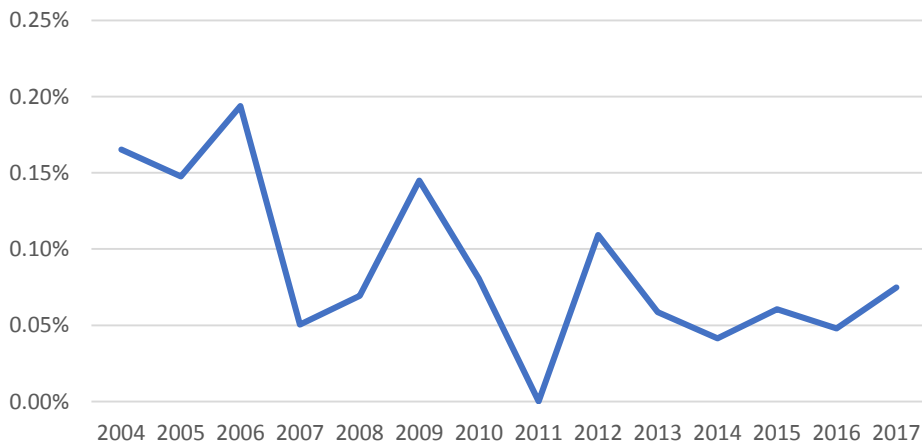
Internet Software % of Companies Funded



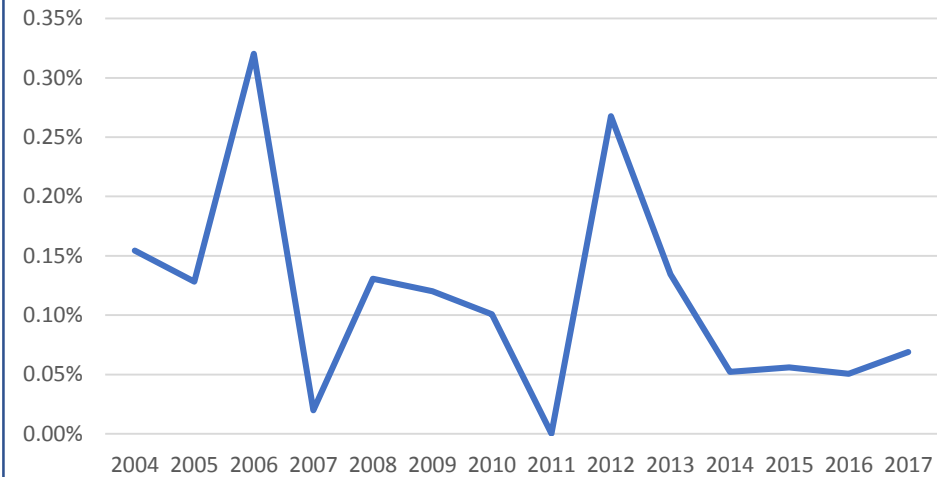
Internet Software % of \$ Invested



Operating Systems Software % of Companies Funded



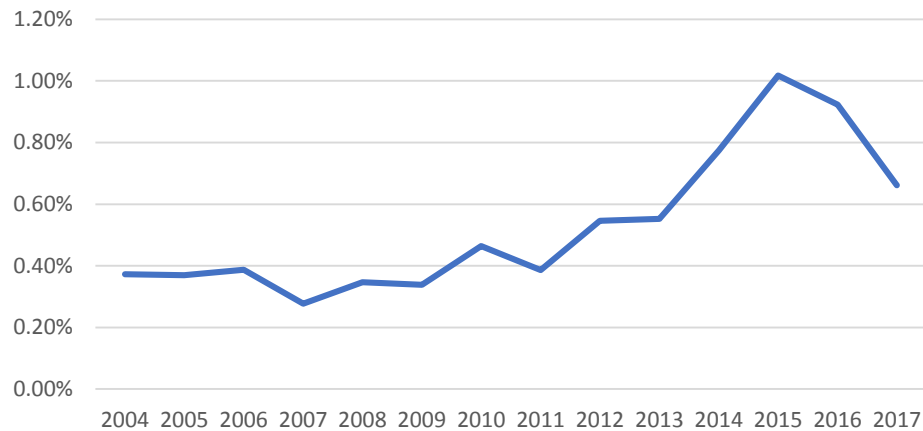
Operating Systems Software % of \$ Invested



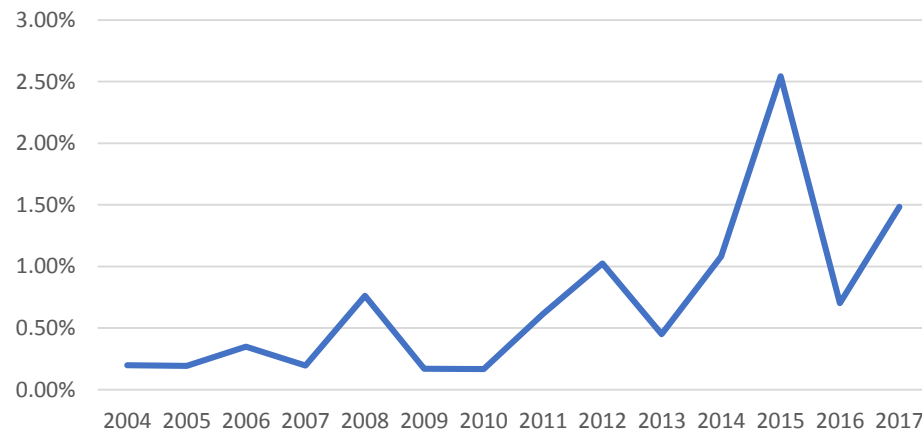
4 – Growth in Consumer and Consumption Sectors That Do Not Require Invention Protections

VC Investment Growth In Hospitality and B2C Consumer

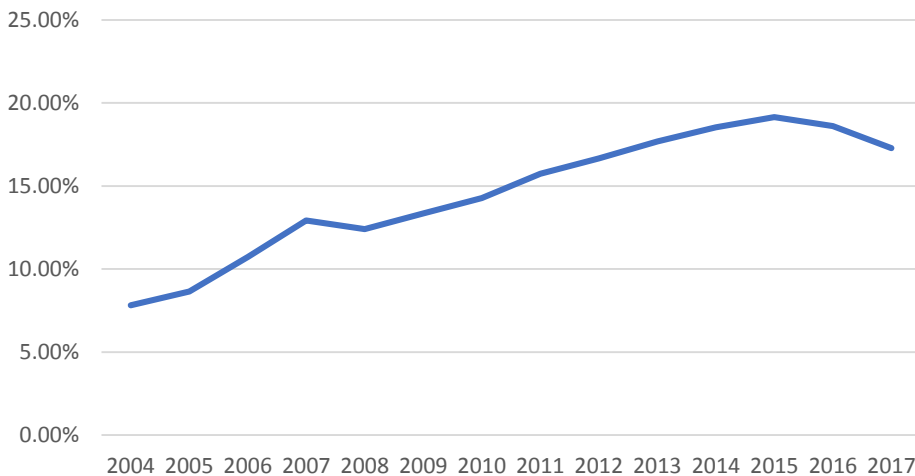
Restaurants, Hotels and Leisure Total % of Cos Funded



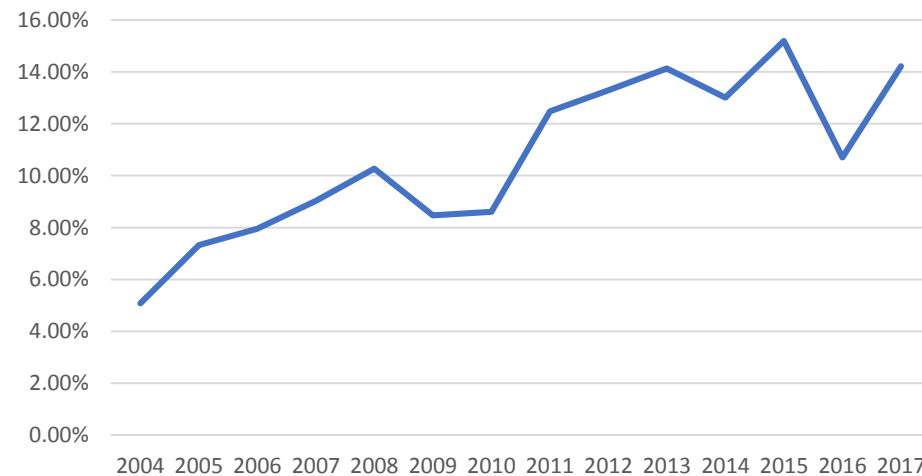
Restaurants, Hotels and Leisure Total % of \$ Invested



B2C Total % of Cos Funded

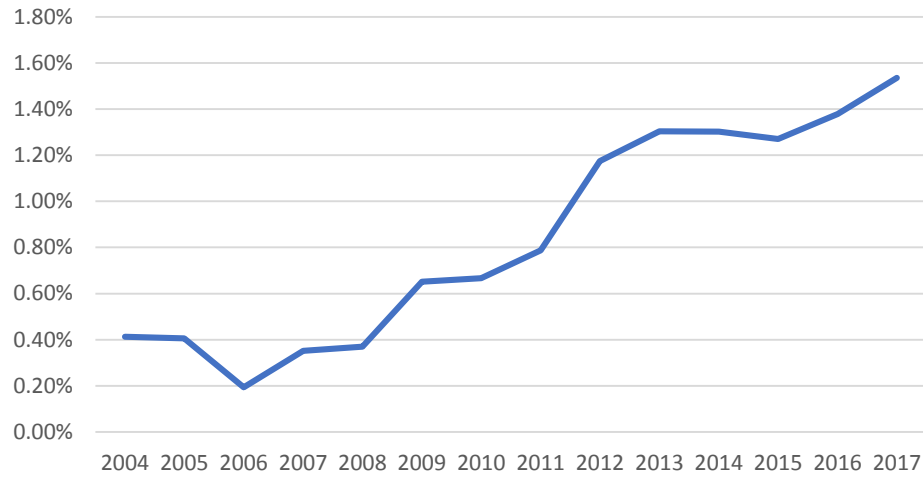


B2C Total % of \$ Invested

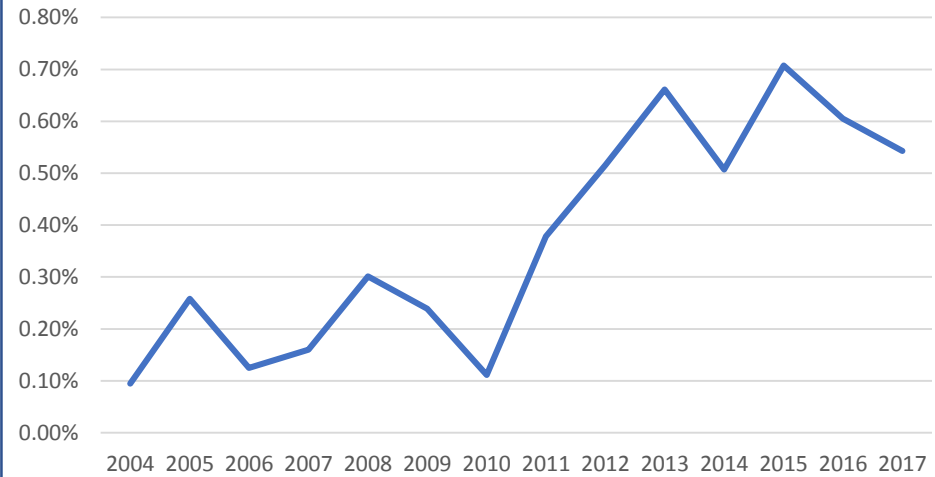


VC Investment Growth In Food and Apparel

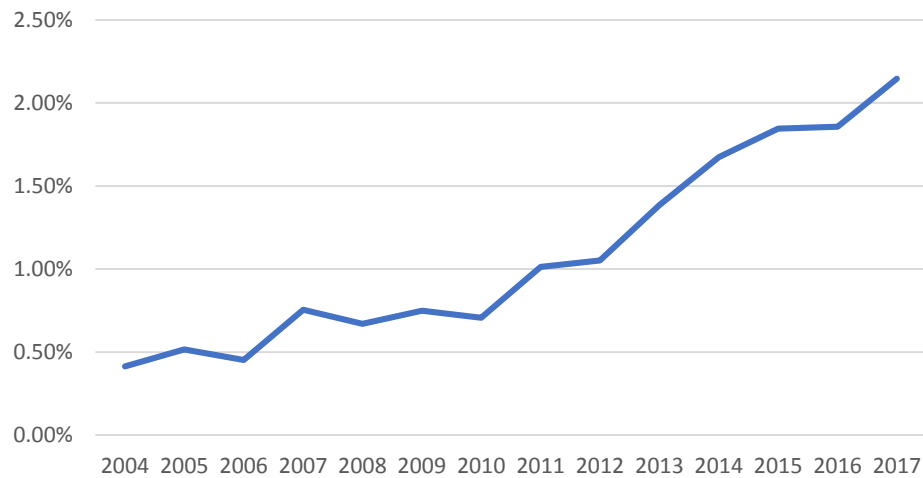
Apparel and Accessories Total % of Cos Funded



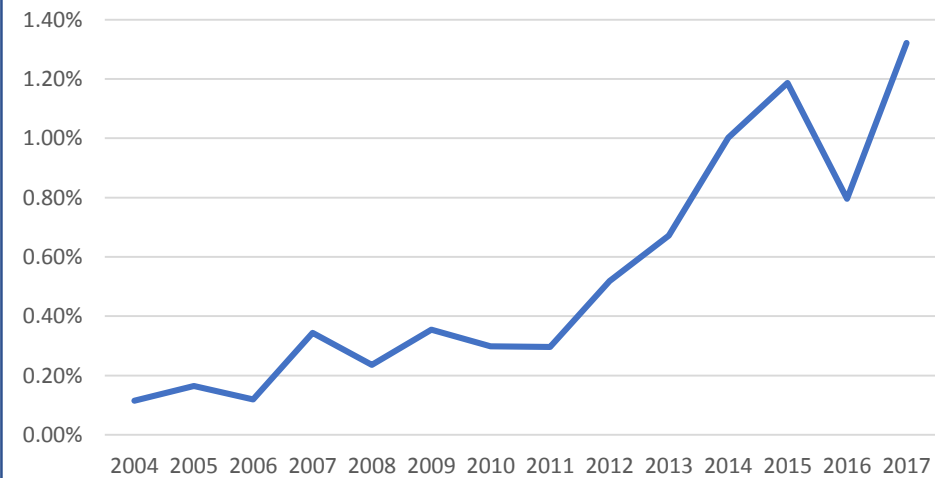
Apparel and Accessories Total % of \$ Invested



Food Products % of Cos Funded'

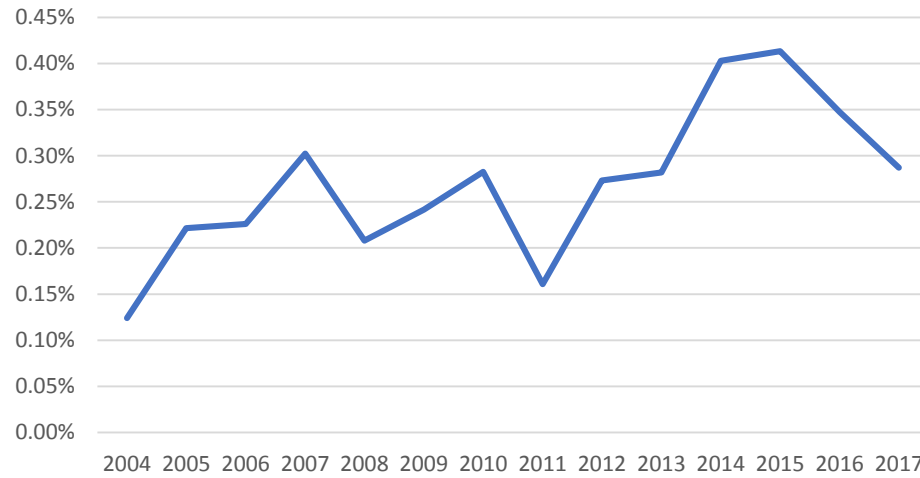


Food Products % of \$ Invested

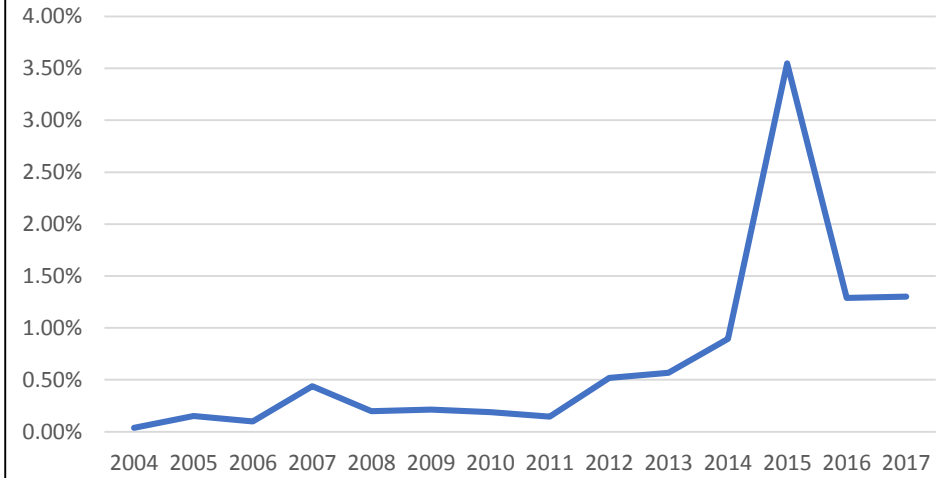


VC Investment Growth In US Finance

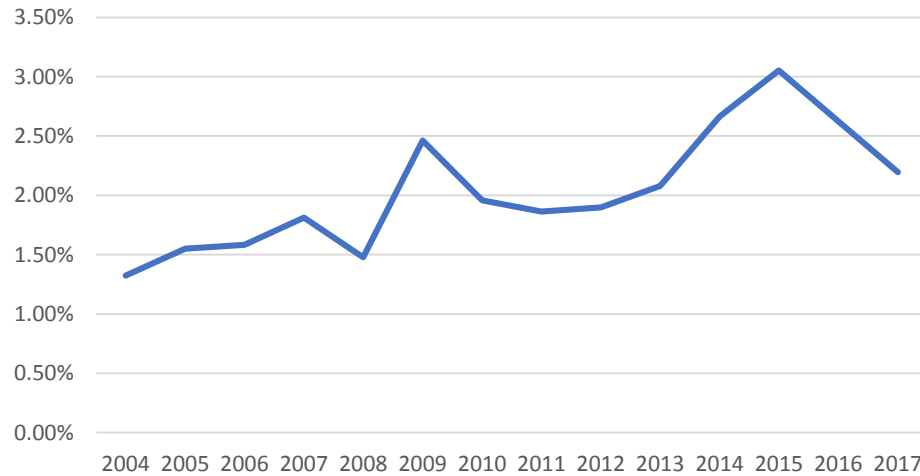
Consumer Finance % of Cos Funded



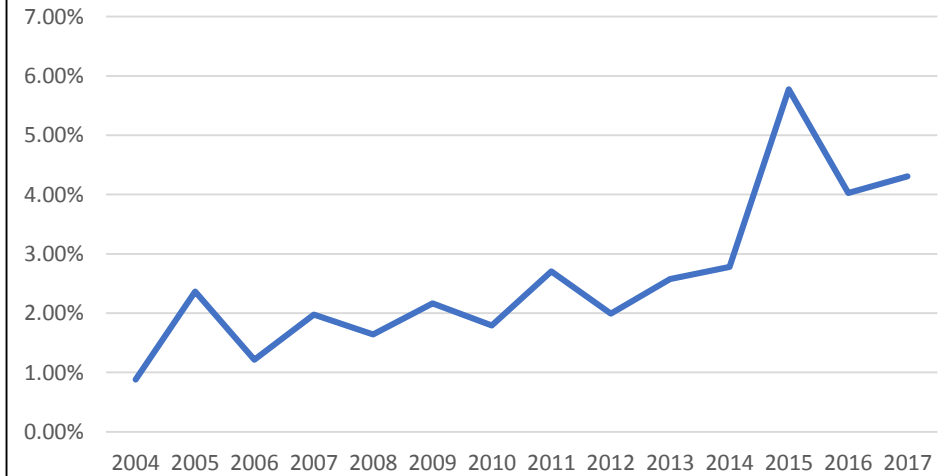
Consumer Finance % of \$ Invested



Financial Services Total % of Cos Funded

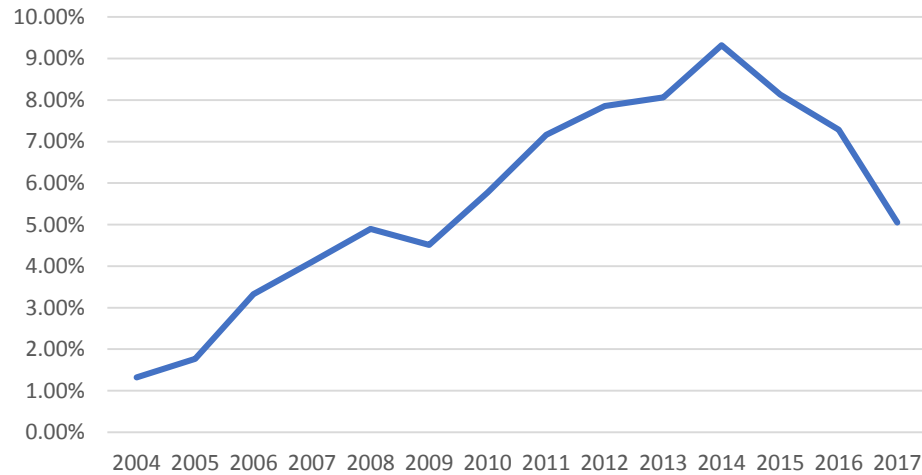


Financial Services Total % of \$ Invested

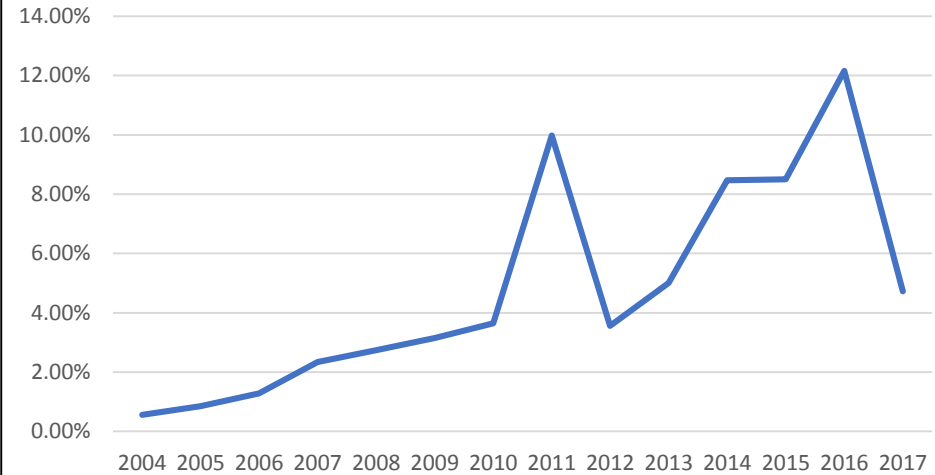


VC Investment Growth In U.S. Non-Strategic SW

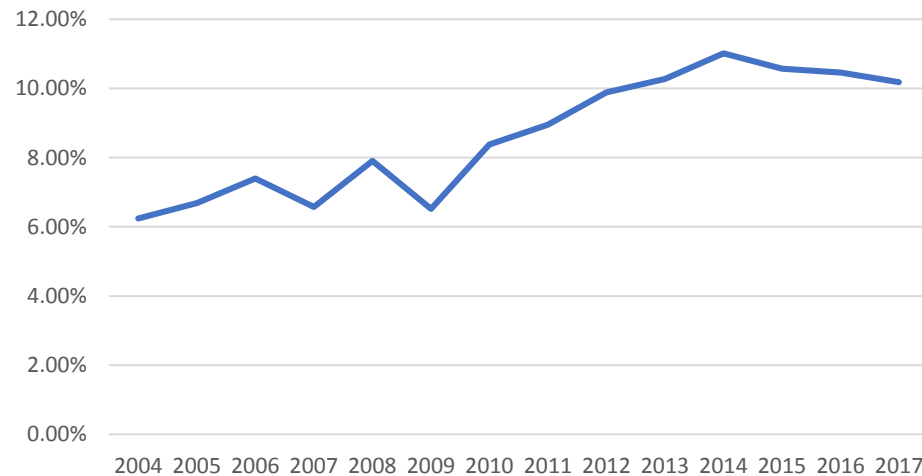
Social/Platform Software % of Cos Funded



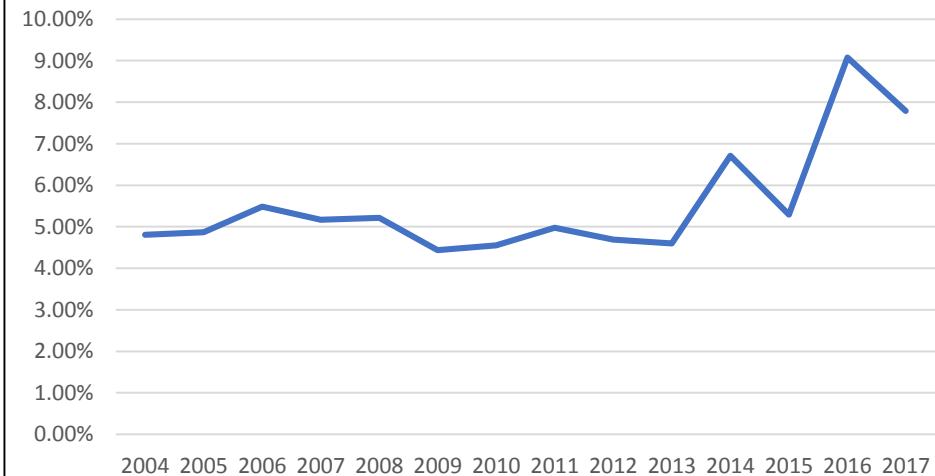
Social/Platform Software % of \$ Invested



App Software % of Cos Funded



App Software % of \$ Funded



Restoring Strategic Incentives

- Restoration of incentives for inventors, entrepreneurs and investors will take years
 - Current PTO Director has strongly emphasized need for reliability and predictability of U.S. Patents
 - Director has broad discretion to establish procedures and policies for examination and post-grant reviews
 - Congress and Supreme Court cannot and will not move quickly
 - Investor and entrepreneur communities have become skeptical and will require convincing
- Current Director has taken significant steps to restore reliability of issued patents
 - Rule reconciling BRI review standard with that used in district courts
 - Efforts to provide reasonable opportunity to amend claims during IPR proceeding
 - Efforts to require identification of surrogates and privies of IPR petitioners for estoppel purposes
 - Apply estoppel rules to eliminate multiple challenges to patent claims
 - Guidance to examiners as to statutory subject matter
 - Trial Practice Guide sets forth rational basis for determining obviousness in IPRs
 - Precedential Opinion Panel created to provide guidance to cadre of PTAB judges
- PTO Director should use his respected voice at Supreme Court and Federal Circuit
 - Amicus briefs in patent and antitrust cases are needed to guide Supreme Court and Federal Circuit
 - Make better use of the “teaching – suggestion – motivation” test for application of Section 103
 - Monitor and help courts in the determination of patent eligibility
- PTO Director can also have significant impact on Congressional views of patents
 - Legislation is pending in Congress that would make positive amendments to Section 101
 - Restoration of presumptive right to injunction is essential to a workable patent system
 - Royalty damages should reflect actual value of patents to the infringer
 - Patent and copyright exhaustion needs to be fixed