

Government activism in high tech leadership: the US case*

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The present and the future of Development Financial Institutions: a learning dialogue

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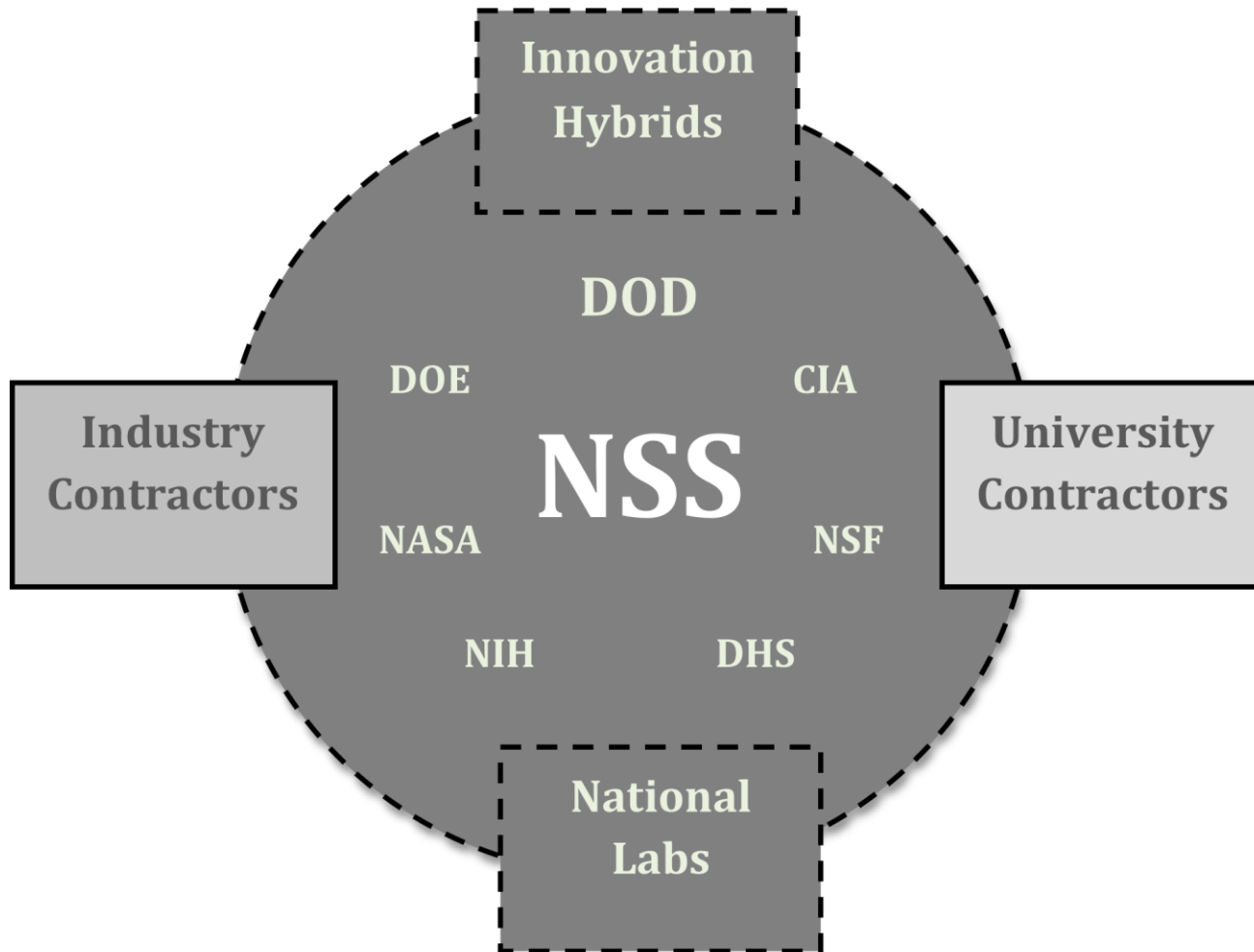
Rio de Janeiro, Brazil

***Presentation based on research findings from my book, *America Inc? Innovation and Enterprise in the National Security State*, Cornell University Press, 2014.**

Outline of argument

- Why does US lead in high tech?
- A risk-taking state: NSS; not just R&D
- Why commercial activism?:
 - the security imperative; private sector reluctance to collaborate
- Case of SBIC program (1958, Sputnik shock): kickstarts modern VC industry
- Financialization & future of US tech leadership: exit from manufacturing; disconnect between innovation & production – impacts
- Concluding points

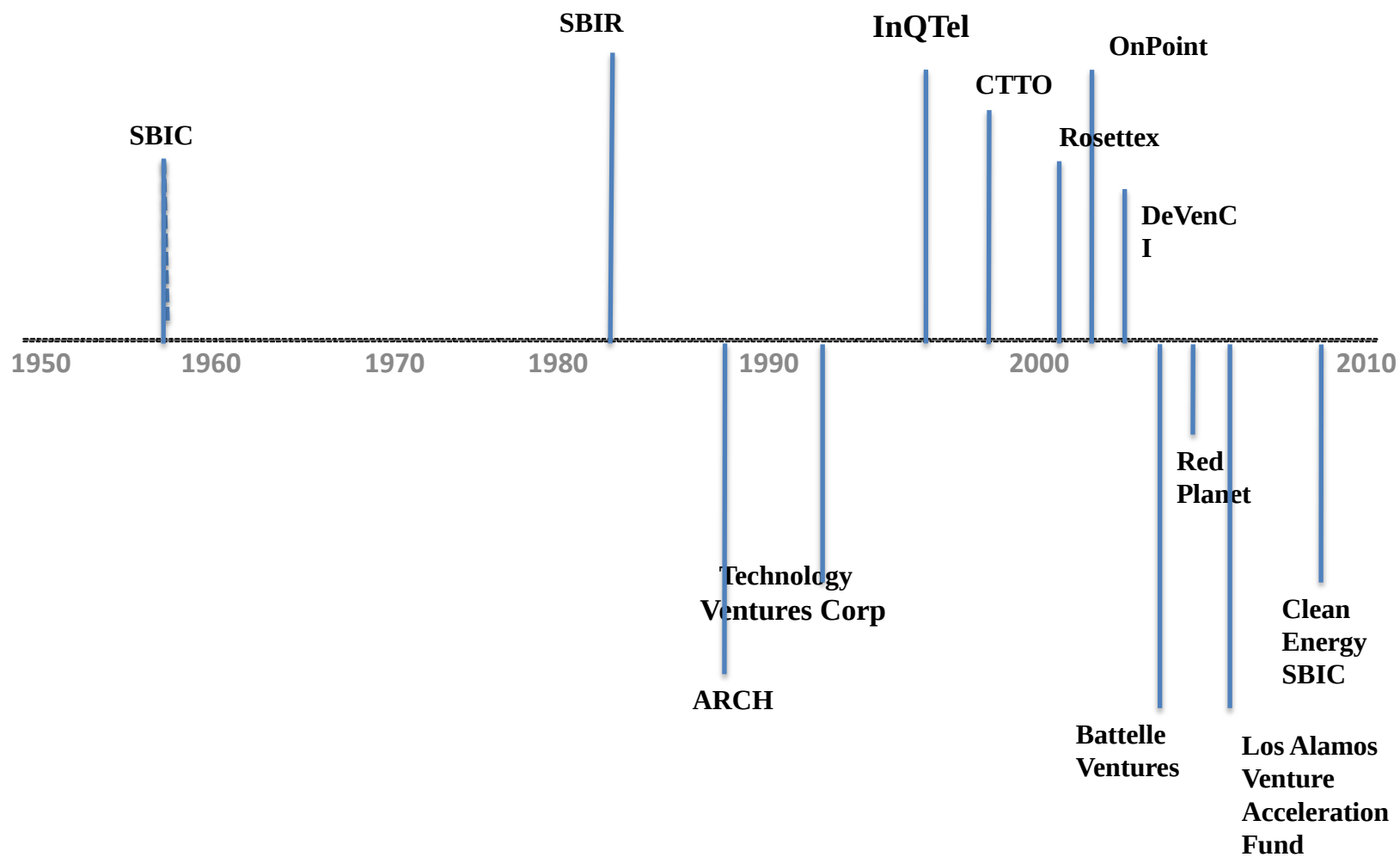
The NSS as Technology Enterprise



What does the NSS do?

- **Contracts with the private sector to *make and buy* things that do not yet exist** – that is, ‘technology procurement’ [DoD, NASA, DoE, CIA];
- **Provides ‘assured demand’** for the innovations through acquisition contracts [from semiconductors to renewable energy devices; e.g. DoD, NASA, DoE];
- **Devises the ‘problem-sets’** for technology developers in the private sector to work with, often yielding major breakthroughs that establish new industry sectors [Office of Naval Research (ONR), Defense Advanced Research Projects Agency (DARPA), DoE, NIH];
- **Finances development of inventions** in the national laboratories, universities, and private sector [NSF, DoD, DoE, NIH, NASA, CIA];
- **Catalyzes the formation of new companies** [all NSS components];
- **Licenses inventions created in the national labs** to U.S. industry; granting firms patents rights to publicly financed inventions [NIH; DoD; DoE];
- **Establishes the foundational infrastructure for the modern VC industry** to boost innovation;
- **Runs Venture Capital (VC) firms** that take equity positions in selected startups and innovative companies [CIA, US Army, DoE, DoD];
- **Creates new institutional forms** that bring NSS-funded inventions to market [numerous examples, ranging from VC funds to commercialization entities];
- **Plugs gaps in innovation networks** by providing a collaborative public space for matching up actors at different points in the innovation chain – researchers, program managers, venture capitalists, manufacturers, and buyers.

Fig. 3.1: Timeline of Government-Sponsored VC Funds

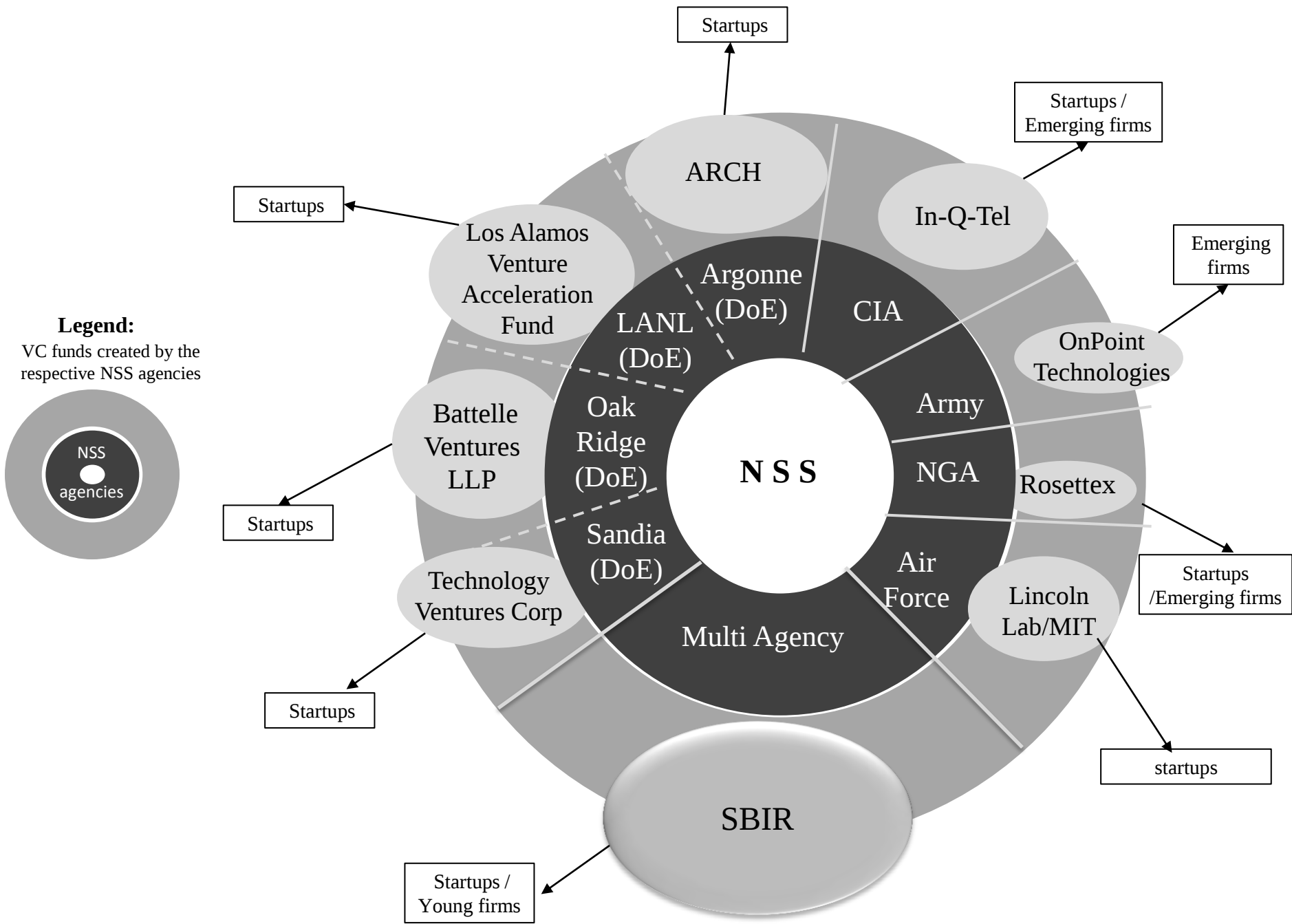


SBIC program (Small Business Investment Companies)

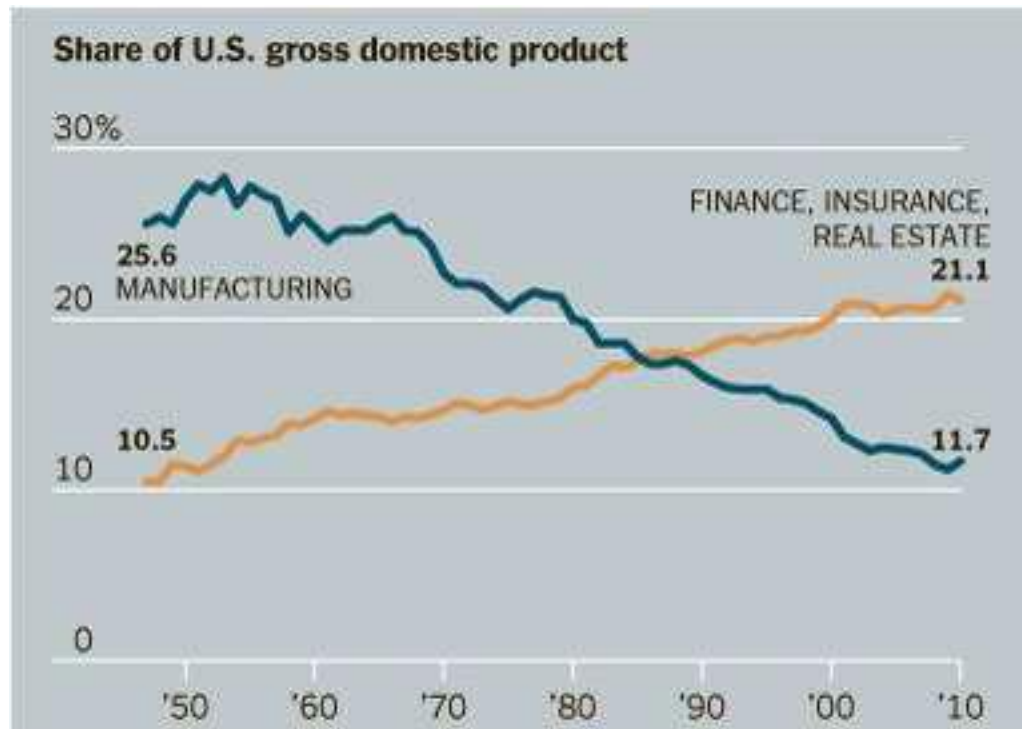
- Govt origins of modern VC industry; Sputnik shock to US innovation.
75 % of total U.S. VC investment (1983).
- **Foundation for modern VC industry** : capital + infrastructure + a cadre of venture capitalists.
- **Hybrids**: Independently owned, for-profit investment companies; merge private & public finance (soft/interest free loans', participating debentures, equity) ;
- **Govt as primary risk taker**:
 - Invests in more high-risk startups than average VC fund.
 - 64 % of early-stage financing - totaling \$14.4 bn (1994 -2002) .
 - Stable source of venture funding - post-fin crisis (2012): invested record \$1.92 bn;
- **Leverages** govt financial input with private capital: govt ratio between 4:1 and 2:1 for every \$1 invested by SBIC.
- Largest single investor in US private equity funds
- end of 2010, > \$8 bn in outstanding leverage , invested in c. 300 private equity partnerships with > \$17 bn in private capital (2010).

SBIR (small business innovation research) Program

- **World's largest source of early-stage funding**; famous beneficiaries: Amgen, Chiron, Compaq, Dell, Symantec, Titan, Qualcomm, Nanosys, & Genentech, & Intel
- **More than \$34 bn invested** in 130,000 early-stage tech dev projects
- **Origins** in domestic innovation crisis, threat to US techno security strategy
- **Multi-agency** program **anchored in NSS** (2.5% of agency R&D budget)
- **100% govt financed** : up to \$1.25 million in direct investment
- **performance standard** : show proof of concept within 6 months as condition of stage 2 funding.
- **preferred avenue** for early tech funding; certification mechanism for third party investors
- In aftermath of financial meltdown: **SBIR provides bulk of all US VC for high-risk technology** (60% of \$4.2 bn in total, in 2009).
- Small relative to private VC (\$2.5bn annual program) - **key difference is technology targetting** (100%).



The Declining Industrial Base: Manufacturing in the U.S. Economy



Source: Anthony H. Cordesman *The US Defense Budget and Changes in US Strategy* Pre FY2013 Budget Submission Report, Center for Strategic & International Studies, January 23, 2012, p. 55.

Manufacturing as percentage of GDP, 2008

