Antitrust and Industrial Policy: A Misunderstood Relationship

Tim Wu[1]

Antitrust and industrial policy have long been understood as separate areas of policy, handled by different officials with different priorities. Superficially they differ and are often presumed to be in conflict. As Daniel Sokol wrote in 2015: "sound antitrust law and policy is in tension with industrial policy. Antitrust promotes consumer welfare whereas industrial policy promotes government intervention for privileged groups or industries."[2]

This paper takes a different view. It urges policymakers to conceive of the antitrust regime as an important tool of industrial policy, particularly for dynamic, technological industries. Stated differently, it advances the view that promoting *competition* (through antitrust) can be an important means of enhancing national *competitiveness* (a goal of industrial policy). This is not to suggest that antitrust is a substitute for other forms of industrial policy, nor to deny that the policies can come into conflict. It is that antitrust can form part of a strategic economic policy and that one should not assume that the policies are necessarily in conflict, or that one must always choose between the two.[3]

In the course of the argument, this paper addresses a common policy argument: that enforcing the antitrust law will invariably disadvantage the country that does it. Such arguments have been around since at least the 1970s. Most recently, over the last decade it has been strenuously argued that subjecting the American tech industry

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[1] [Draft 1.0. Comments welcome and can be sent to twu@law.columbia.edu] Columbia University School of Law. For comments I thank Scott Hemphill, Heather Boushey, Ayse Gizem, Daniel Hanley, Audrey Stienon and the Columbia law faculty for helpful feedback and comments.

[2] D. Daniel Sokol, *Tensions between Antitrust and Industrial Policy*, 22 GEO. MASON L. REV. 1247, 1247 (2015).

[3] It joins other work reexamining the relationship between the two fields, including Stienon, Audrey and Hanley, Daniel, Coordinating Market Actors for the Public Good: Competition Policy as the Industrial Policy of Democratic Economic Governance (May 21, 2025). Available at SSRN: https://ssrn.com/abstract=5271542 or http://dx.doi.org/10.2139/ssrn.5271542. Relatedly the Council of Economic Advisors in the Biden Administration in October 2023 released "Guidance on Accounting for Competition Effects When Developing and Analyzing Regulatory Actions" available at https://bidenwhitehouse.archives.gov/wp-content/uploads/2023/10/RegulatoryCompetitionGuidance.pdf

to antitrust attention gave an advantage to Chinese firms.[4] Both theory and the case studies in the second part suggest the opposite conclusion: that a failure to enforce the laws can weaken an industry over the longer turn and make it vulnerable to disruption by overseas firms.[5]

To give a more concrete sense of what it means for antitrust to operate as industrial policy, consider the well-known AT&T monopoly lawsuit of the 1970s-80s. That well known case was initiated in 1974 and yielded the 1984 breakup of AT&T into eight firms and lasting restraints on the conduct of the divested firms.

Viewed in retrospect, the case represented the use of antitrust law to change industry structure — both to make the telecommunications more competitive and remove AT&T's bottlenecks on various technologies. Previously, the federal government had accepted, and indeed encouraged, an exclusionary, integrated monopoly of telecommunications.[6] With the lawsuit and remedy, the industry gained a vertically de-integrated structure and rules meant to prevent exclusionary behavior.

The stated goal of the litigation was to bring down long-distance rates. OBJ However, the action had much broader economic effects. It ended up serving as a major aid not just to long-distance providers, but also to a number of nascent industries, including the early online service provider industry and electronic [7]manufacturers.OBJ Those firms would later combine to offer internet services to consumers, creating an addressable internet market, which in time spanned the internet industry, Web 2.0, and so on. The U.S. internet industry itself later became a major exporter of services. While that future was not intentionally chosen, the AT&T case encouraged these developments, which have obviously stimulated much economic growth and helped the United States be a global leader.

What would have been the alternative? To achieve similar results using subsidies or other traditional industrial policy tools, Congress would have had to protect and subsidize nascent online services and equipment industries over the 1970s. Doing so would have required foresight so extraordinary as to make it implausible. Suffice to say that there was no such legislation proposed at the time with this kind of vision. Hence, limiting the exclusionary effects of AT&T's monopoly was the more effective approach.

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[4] *See, e.g.*, Salvador Rodriguez, *Facebook's Sheryl Sandberg: Chinese Tech Companies are Also Powerful, and Will Not Be Broken Up,* CNBC (May 17, 2019), https://www.cnbc.com/2019/05/17/facebooks-sheryl-sandberg-cnbc-interview.html.

[5] See infra Part II.

[6] TIM WU, THE MASTER SWITCH 159 (2010).

[7] TIM WU, THE MASTER SWITCH 195 (2010).

Claims Made

The intended audience of this paper is industrial policy practitioners and policymakers, and for this audience its claims can be stated clearly. First, the antitrust regime should be understood as one tool in a broader toolkit of industrial strategies. In the typology of industry-strengthening mechanisms developed below, it is a form of industry *discipline* -- intentionally subjecting an industry to rigor to improve its performance, which can also be understood as a form of *training.* Second, this paper claims that antitrust, as a tool, has mechanism of action that are distinctive from other, more traditional tools like subsidies and tariffs. Those, I argue, give it advantages for certain industries.

The first point can be overlooked because antitrust has much different mechanisms of action than the classic approaches to industrial policy. Much of industrial policy consists of aid; antitrust is, instead, the stick instead of the carrot. Yet it ultimately shares the goal of strengthening an industry and its broader ecosystem, through at least two mechanisms of action.

First, forcing firms to compete instead of colluding or combining forces domestic firms to constantly improve or risk losing market share.[8]. The need to compete, in the ordinary course, can be expected to yield stronger firms.[9] As George Romney, CEO of American Motors argued in 1958: "Where competition is shrinking below adequate minimum levels, even the most efficient company will ultimately lose its competitive drive. Like boxing champions who lack suitable opponents, companies will become soft and flabby."[10]

Second, antitrust can also strengthen an industry by reducing the exclusionary effects of a firm of firms that control an essential platform or bottleneck.[11] This mechanism may be less familiar to scholars and practitioners of industrial policy. Many industries, particularly tech industries, center on a platform and an ecosystem of related products and services. Market or monopoly power in one part of an industry can slow growth and innovation in adjacent industries for a variety of reasons, like the monopolist's defense of its market position. Antitrust law can deter or punish efforts by

[8] See *infra* Figure 1.

[9] There are exceptions to this, as discussed in Maurice E. Stucke & Ariel Ezrachi Competition Overdose: How Free Market Mythology Transformed Us from Citizen Kings to Market Servants (2020).

[10] TOM MAHONEY, THE STORY OF GEORGE ROMNEY 220 (1960).

[11] *See* Thurman Arnold, The Bottlenecks of Commerce 1940.

the monopolists to prevent growth and innovation that might be threatening to the monopolist.

The AT&T case described above gave an example: the well-known Microsoft case provides another illustration of this dynamic. Microsoft controlled the Windows operating system but felt threatened by the rise of the Internet browser and firms using the browser. The Justice Department's intervention deterred any suppression of co-opting of the ecosystem that later grew on top of the browser – that is, the rise of today's major tech firms (Google, Facebook, among others).[12]

Antitrust may, in a similar fashion, reduce barriers to market entry, facilitating growth or innovation in monopoly-adjacent industries in a larger ecosystem. In other words, by preventing or deterring vertical foreclosure, small firms in adjacent markets may have more room to grow or bring innovations to market. These mechanisms are very familiar to antitrust scholars[13] but rarely considered in the context of national competitiveness or strategic economic policy. But it clearly leads to the view, advanced here, that the antitrust system can act as an important complement to other industrial strategies.

Domestic competition is not the only means of discipline. It is also the case that competition from imports provided by foreign firms can also discipline the local industry. For example, as detailed below, the success of Japanese car manufacturers in the 1960s and 1970s forced American firms to improve their production efficiency and begin manufacturing smaller cars. However, from a national welfare perspective, there is a significant difference between promoting domestic competition and the competition coming from trade. The latter gives much of the producer surplus to another nation's firms; the former enhances national welfare. From industrial policy or national welfare perspective, it is clear which is preferable.

The second claim is that the mechanisms of antitrust may have certain advantages over more traditional tools of industrial policy, for two reasons. One set relates to the mechanisms of action. The classic tools of industrial policy do not include tools that reduce the exclusionary effects of monopoly. The second relates to the well-studied public choice challenges that accompany the successful use of subsidies and tariffs, as described here.

[12] For a fuller exposition of this point, see Tim Wu, The Curse of Bigness (2019).

[13] See, e.g., Steven C. Salop, Invigorating Vertical Merger Enforcement, 127 Yale L.J. 1962 (2018).

There are several typical and significant challenges inherent in the project of industry aid. There are informational problems (the difficulty of "picking winners" given imperfect information and various heuristic biases),[14] the potential for corruption (the capture of government by industry), and problems related to execution.[15] While nothing is free from the potential for human error and influence, there are several ways in which acting through antitrust may help minimize such problems.

First, investigations of exclusionary conduct, while imperfect, represent a focused effort to identify conduct that impedes competition or raises the costs of market entry. A successful antitrust investigation and trial requires proving to a factfinder that there are in fact costs imposed upon an industry or firms by a dominant firm. That is a higher barrier than, say, imposing a protective tariff.

Second, antitrust investigations and lawsuits are unwelcome and unpleasant. They are not something a target might seek out (unlike a subsidy or protective tariff.) Hence, the public choice dynamics are different and help avoid the concern that an entrenched or declining industry will attract government interest (the "loser's paradox.")[16] That said, no process is entirely pure, and it is true that rivals can and do lobby government to convince it to sue a rival. It is also true – as Daniel Sokol argued – that powerful firms may lobby for an immunity to antitrust.[17] But it remains the fact that the political economy is different, and arguably less prone to political distortion than the process of legislature-driven subsidization.

These are some of the reasons that antitrust is different, and in some contexts may be a better means of strengthening an industry than classic tools of industrial policy. The second part of the paper conducts case studies of four tech-centered industries to support the point.

A Tale of Four Tech Industries.

The second part of the paper conducts a qualitative and comparative study of four technology-centered industries: aerospace, computing, telecommunications and automotive, from the mid to early 20th century. Over that period these four industries had several things in common. All were relatively new, dependent on evolving technologies, and subject to significant economies of scale. All became industries

[14] F. A. Hayek, *The Use of Knowledge in Society*, 35 AM. ECON. REV. 519, 530 (1945).
[15] Ernesto Dal Bó, *Regulatory Capture*, 22 OXFORD REV. ECON. POL'Y 203, 203 (2006).
[16] *See infra* note 35 and accompanying text.
[17] *See* D. Daniel Sokol, *Limiting Anticompetitive Government Interventions That Benefit Special Interests,* 17 GEO. MASON L. REV. 119, 127-135.

concentrated in a small number of firms with significant market power, and in some cases, monopolies.

From the U.S. government's perspective, the desired outcomes were also similar: growth, innovation, development of auxiliary industries, and the development of export products. But a major difference between them has been the approach taken to them by the U.S. government. All four enjoyed research and innovation assistance, most often through the U.S. military. But one difference does stand out.

Two of the four, the computing and telecommunications industries became subject to intense antitrust interventions by the U.S. Department of Justice, including lawsuits meant to weaken or break up the major monopolists in both industries (suits against AT&T, IBM, Microsoft, and Intel). The telecommunications industry was also subject to various interventions by the FCC from the 1970s to 2010s generally meant to stimulate competition by lowering barriers to entry.

In contrast, the aerospace and automotive industries were given a weaker level of antitrust scrutiny. The United States prepared but did not file an antitrust case against General Motors in the 1960s.[18] Boeing was subject to limited antitrust attention and was permitted to buy its rival McDonnell Douglas in the 1990s despite the Clayton Act.[19] Relatedly, unlike the FCC, the Department of Transportation has not generally made efforts to lower barriers to entry in aerospace or the automotive industries.

This article suggests that the different treatment of these major tech industries has helped account for different structural outcomes and contributed to different rates of growth and innovation. The computing and telecommunications industries have a more decentralized structure, have seen the emergence of challenger firms and a process of industrial succession. They have also seen the birth of industries that developed adjacent to the original industry: including the software industry, which benefited from the IBM antitrust case,[20] and the internet industry, which developed "on top" of the telecommunications industry.[21] These two industries have also experienced far more growth, as detailed below.

The American aerospace and automotive industries, over the period studied, remain dominated by the same firms that were dominant in the 1950s (Boeing, GM and

[18] ED CRAY, CHROME COLOSSUS 445 (1980).

[19] Kathleen Luz, *The Boeing-McDonnell Douglas Merger: Competition Law, Parochialism, and the Need for a Globalized Antitrust System*, GEO. WASH. J. INT'L L. & ECON. 155, 162 (1999).

[20] *See* Burton Grad, *A Personal Recollection: IBM's Unbundling of Software and* Services, 24 INST. ELEC. & ELECS. ENG'RS ANNALS HIST. COMPUTING 64, 71-72 (2002).

[21] TIM WU, THE CURSE OF BIGNESS 96 (2018).

Ford). The growth of the industry has been far more limited. To be sure, firms and industries are complex, and there is no claim that the only reason for the differential outcomes is antitrust enforcement. The argument is that enforcement contributed to improved competition and growth.

Another difference between the four industries concerns trade: the automotive, computing and aerospace industries from the 1970s onward become subject to significant foreign competition, while telecommunications did not. Some might argue that this factor accounts for the different outcomes, or that relaxed antitrust enforcement was an appropriate reaction to the success of Japanese automakers in the U.S., and the rise of Airbus over the 1970s and 1980s. This paper disagrees for two reasons. First, there may be significant endogeneity at play: the lack of meaningful domestic competition in US automotive in the 1960s arguably made it much more vulnerable to external competition. Second, the computing industry, like automotive and aerospace, was also exposed to competition from European and Japanese firms, yet its development was different. The antitrust attention, while hard on IBM, did not weaken U.S. computing and ultimately helped the U.S. develop a lead in key technologies.

There, overall, is limited support in these studies for the proposition that antitrust attention hindered the growth of the industries subjected to it. In fact, while a limited sample, the studies suggest the opposite: that the computing and telecommunications industries, which have been subject to aggressive attention, have seen more innovation, industrial succession and grown faster than aerospace and automotive. These are obviously complex industries with many factors at play, but there is reason to think that antitrust enforcement played a role in the relative strength of these four U.S. tech industries.

If nothing else, there is a clear argument that *lack* of antitrust attention can yield industrial stagnation.

Part I: Conceptions of Industrial Policy, old and new.

State action meant to promote industry is at least as old as the nation-state itself. In the United States it dates to the founding era, when Alexander Hamilton in his 1791 *Report on the Subject of Manufacturers* urged government support for manufacturing through a mixture of tariffs, subsidies, and the building of infrastructure.[22]

[22] Alexander Hamilton, Report on the Subject of Manufactures (Dec. 5, 1791), *in* 10 THE PAPERS OF ALEXANDER HAMILTON 230 (Harold C. Syrett ed., 1966).

What is meant by the term "industrial policy" has shifted over the years, it is now subject to both a narrower and broader understanding The narrower — here described as "classic" conception of industrial policy -- is closely linked to trade policy and usually centered on the use of subsidies and tariffs to help or protect industries as they grow, usually with the intent of replacing imports or creating export products. The broader understanding, sometimes described as "strategic economic policy" is captured by this definition: "government policies that explicitly target the transformation of the structure of economic activity in pursuit of some public goal."[23]

"Classic" and New Understandings of Industrial Policy

Since at least the 19th century, industrial policy has been closely associated with trade policy. The classic form is usually associated with an effort to develop or an export industry or to reduce domestic reliance on imports, or both. The American aircraft industry, for example, was subsidized both to satisfy domestic demand from U.S. airlines, and also to support the export of American airplanes to foreign buyers.[24]

Some strategies, however, are more focused, or exclusively focused on exports or imports. An export strategy is one that lends support to products designed to appeal to foreign buyers. The efforts of East Asian countries to develop products for Western exports markets — but not domestic consumption — is an example. Many products produced by nations like Taiwan during its growth (say, western-style bathing suits) had very limited or no domestic market.[25]Some countries explicitly ban the sale of export products in domestic markets.[26]

Another approach is the so-called "import substitution" model, in which a country attempts to create domestic substitutes for what would otherwise be imported.[27] From the late 1940s through the 1970s many nations in the developing world attempted to build their own substitutes for foreign consumer goods. In India, which pursued such policies, that yielded companies that produced clones of English products, like Hindustan motors and "the Ambassador," an Indian version of the Morris Oxford Series

[23] Juhász et al., *New Economics*, *supra* note 24, at 216.

[24] JOHN NEWHOUSE, BOEING VERSUS AIRBUS 50-53 (2007).

[25] Tina Vinquist, *Trade in Domestically Prohibited Goods*, INT'L INST. SUSTAINABLE DEV (1999), https://www.iisd.org/system/files/publications/viet_dpg.pdf.

[26] *Import & Export in Taiwan (2023): Trade Policies & Regulation*, OOSGA, https://oosga.com/briefings/twn-trade-policies/ (last updated Oct. 31, 2023).

[27] Douglas A. Irwin, *The Rise and Fall of Import Substitution*, 139 WORLD DEV., Mar. 2021, at 1, 1.

III automobile.[28] Many of these import substitution models were unsuccessful, which has given import substitution a bad name. However, there are also well-known success stories: like the Chinese government's protection and buildup of its internet industries — yielding firms like Baidu, TikTok, Alibaba and other substitutes for American firms like Google, YouTube or Amazon.

To summarize, the traditional or classic sense of industrial policy has the following characteristics:

- Linked to trade policy with primary tools including subsidies, tariffs, quotas and informal barriers to trade. The goal is usually developing an industry capable of competing domestically and internationally.

- Associated with manufacturing capacity and scale industries.

- A track record of hits and misses, with strong examples of both. Classic industrial policy is highly dependent on government choosing the right industry to support at the right time and stage of development.

Over the last decade a group of economists led by Réka Juhász, Nathan J. Lane and Dani Rodrik have sought to define industrial policy more broadly over the last decade. The trio use the definition quoted above: "government policies that explicitly target the transformation of the structure of economic activity in pursuit of some public goal."[29]

Juhász, Lane and Rodrik are joined by others, including a number of IMF authors who have chronicled the rise of new and older forms of industrial policy, like tax credits, local-content rules, green subsidies, trade measures, and state-backed finance.[30] Commentator Richard Haussman stresses a focus on the "complementarity between public and private goods" and states that the question "is not whether industrial policies should exist, but how they should be managed."[31]

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[28] Graeme Roberts, *INDIA: Hindustan halts 'Morris Oxford' Ambassador production*, JUST AUTO (May 27, 2014), https://www.just-auto.com/news/india-hindustan-halts-morris-oxford-ambassador-production/?cf-view.

[29] Juhász et al., *New Economics*, *supra* note 24, at 216.

[30] Simon Evenett et al., *The Return of Industrial Policy in Data* 13 (Int'l Monetary Fund, Working Paper 24/1 2024).

[31] Ricardo Hausmann, *Why Industrial Policy is Back*, PROJECT SYNDICATE, (2023), https://www.project-syndicate.org/commentary/why-economists-have-rediscovered-industrial-policy-by-ricardo-hausmann-2023-01.

As we have said, the classic conception of industrial policy was centered on tariffs, manufacturing and dependent on decisions as to what might be promising sectors. The broader conception encompasses *any* government action that is pursuing a strategic vision of the economy's future.[32] As such, it would include what might also be considered innovation policies, like adopting a patent system or investing in research. It would include public investment or subsidies for infrastructure (like the 19th century railroad) in support of economic growth.

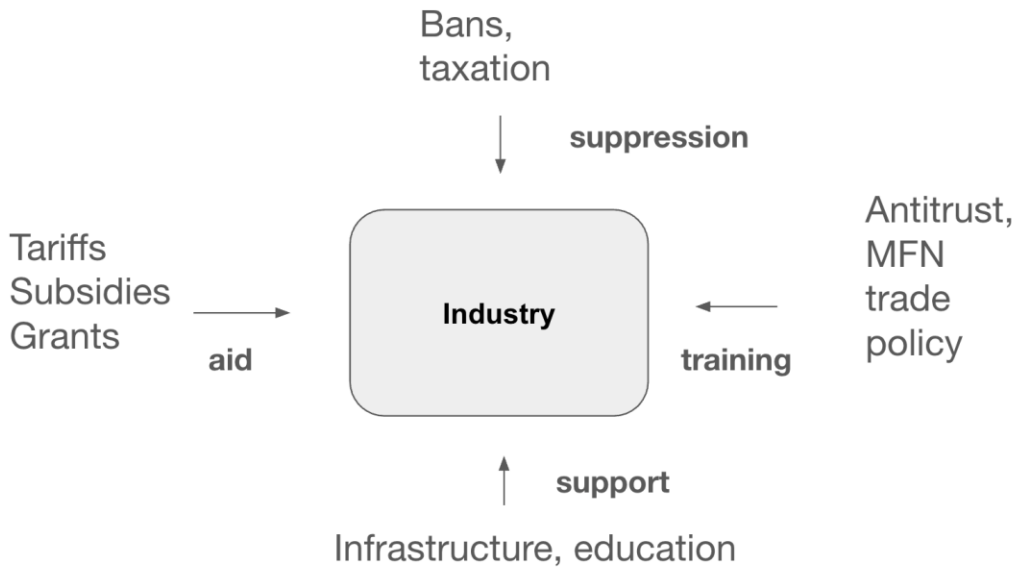
The newer definition is not so broad as to merely be synonymous with public economic policy. Even in the broader view, industrial policy remains that which is motivated by a long-run goal, driven by some vision, however general, for what the economy should look like. In the words of Chalmers Johnson, "[t]he very existence of industrial policy implies a strategic, or goal-oriented, approach to the economy."[33] It is therefore different, for example, than economic policies that are meant to handle adjustments to macroeconomic shocks, or aid the sick or disabled, or feed the hungry, even if these may have positive effects.

A Typology of Industry Strengthening Techniques

Without entering the debate over what should and should not count as industrial policy, this paper proposed a typology of mechanisms that government uses to strengthen industry or otherwise influence its development. It proposes grouping the mechanisms of such industry-shaping into four major categories: *aid*, *support*, *discipline* and *suppression*.

Fig 1: Four Forces of Structural Industry Intervention

[32] Rodrik, *supra* note 29, at 3.
[33] CHALMERS JOHNSON, MITI AND THE JAPANESE MIRACLE 19 (1982).



Aid. Aid as meant here is the direct assistance provided to firms in the form of money or protection from competition. What we have called the tools of classic industrial policy are in the categories of industry aid. They include subsidies, grants, loans and loan guarantees, government contracts, and any other mechanism by which government directly gives money, saves money or protects from competition an industry of firms within it. The mechanisms of action for the different forms of aid are, of course, different. A subsidized loan may merely give industry access to necessary credit but give no further disadvantage. A tariff puts foreign competitors at a disadvantage; an import ban eliminates them. Direct aid has been the subject of the most intensive study by economists and others and is sometimes taken as synonmous with industrial policy.

Support. Support for industry is best defined as indirect aid to an industry. It is the government's creation of public goods from which industry benefits. For example, the government might fund scientific research or an education system that trains engineers, which indirectly aids industry by freeing it from having to spend money on such inputs itself. Its investments in infrastructure like good roads or a fiber internet network save private firms from having to construct private versions.

Unlike direct aid, support as meant here is indirect; the government does not necessarily know who the beneficiary will be. When cities and towns commissioned electricity grids, for example, they did not necessarily realize who would be the beneficiaries, especially much later in time.

Discipline. Discipline measures are interventions meant to improve an industry by forcing firms to improve performance or face losing market share or otherwise suffering. A major mechanism of training is the antitrust law, discussed in detail below,

but there are others. Certain government contests (for a prize, including some patent awards) can also improve the quality of an industry. A trade policy that grants foreign firms access to domestic markets, and thereby exposes domestic firms to foreign competition, may also train the domestic industry (as was the case in the U.S. automotive industry, discussed *infra*).

Suppression. Suppressive interventions aim to depress or weaken an industry. They can be unintended, as when regulation with one goal suppresses another industry. Government may suppress industries for reasons having little to do with economic strategy -- some nations ban the sale of alcohol, for example.

While it may seem strange to think of suppression as a form of economic strategy, it can be. It can represent a strategic decision to move on from technology, or away from high negative-externality industries. For example, a country wishing to transition to newer forms of power generation might deliberately suppress an older industry, both for the sake of technological transition and growth, and also based on a judgment that the externalized environmental and health costs does not merit the benefits.

Some Challenges facing Classic Industrial Policy

The practice of classic industrial policy has been challenging and controversial for several reasons. While usually well-intentioned, government support for an industry or a specific firm can go wrong in several well-known ways. Most of these ways relate to the limits of government decision-making, itself linked to the information challenges, including the inherent difficulty of predicting the future.

1. *The "Loser's Paradox" — Aid to declining industries.* In the ideal case, government would subsidize the industries of the future who might otherwise lack capital or resources necessary to get a start (so called "infant industries"), or those that are in the process of expansion and might benefit from help. But governments may instead aid well-established firms and industries who are failing or in decline. The "loser's paradox" literature argues that such favoritism for industries in decline is likely, and in its stronger versions claims such bias is systematic and unavoidable.[34]

Economists of this bent have given more than one reason to suggest that governments subject to interest group influence might favor industries in decline. One

[34] *E.g.*, Richard E. Baldwin & Frédéric Robert-Nicoud, *Entry and Asymmetric Lobbying: Why Governments Pick Losers*, 5 J. EUR. ECON. ASS'N 1064 (2007); Gene M. Grossman & Elhanan Helpman, *Protection for Sale*, 84 AM. ECON. REV. 833 (1994).

set of theories, advanced by Patricia Tovar, focuses on "loss aversion."[35] It assumes that governments (like people) "place a larger welfare weight on the loss of a given amount of income than on a gain of the same amount."[36] Hence, the prevention of further losses from a declining industry may take on greater urgency than helping a new industry achieve gains. A similar argument based on "identity bias" suggests that governments prefer to help identifiable people (saving jobs) instead of aiding unknown workers of the future.[37]

Another theory, advanced by Richard E. Baldwin and Frédéric Robert-Nicoud, takes a public choice approach and focuses on the relative appropriability of the rents gains through lobbying.[38] According to this theory, declining industries are better able to seize the rents they gain from lobbying as compared with newer industries, characterized by ease of entry.[39] Hence, as they argue: "it is not government policy that picks losers but rather the losers who pick government policies."[40]

These points depend on an empirical question: that there is, in fact, a loser's paradox – that declining industries do in fact attract disproportionate government aid. The original evidence supporting the existence of a loser's paradox was based on a mixture of intuition and older U.S. studies suggesting that industries in decline receive a disproportionate share of protection. Some of the common US and European industries depicted include agriculture, clothing, footwear, steel, textiles, and certain extractive industries, like the West Virginia coal industry. However, the empirical basis of the loser's paradox literature has been challenged in recent years.[41]

2. *Imperfect information and difficulty predicting the future.* At the risk of stating the obvious, predicting the future is difficult. The success in which humans have had in forecasting is in data-rich repeat scenarios like weather or sports events.[42] Predicting the future of technological evolution is far harder. And successful industrial policy requires making a prediction about the growth prospects of a particular industry and, sometimes, individual firms. Even if not corrupted or influenced by cognitive bias,

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[35] Patricia Tovar, *The Effects of Loss Aversion on Trade Policy*, 78 J. INT'L ECON. 154, 156 (2009).

[36] *Id.* at 154.

[37] Anne Krueger, *Asymmetries in Policy Between Exportables and Import-Competing Goods*, *in* THE POLITICAL ECONOMY OF INTERNATIONAL TRADE 161, 169 (Ronald W. Jones & Anne O. Krueger eds., 1990)

[38] Baldwin & Robert-Nicoud, *supra* note 35, at 1065-66.

[39] *Id.* at 1066.

[40] *Id.*

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[42] See discussion of prediction in Tim Wu, the Age of Extraction ch. 8 (2025).

the practice of choosing winning industries remains a challenge, for even the most confident predictions as to what will matter for the future can often be completely wrong.

For example, in the early 1990s many in the United States government were convinced that American supremacy in flat screen display devices was vital to the future of the U.S. economy.[43] In retrospect, that was probably not the case. Instead, over the 90s, far more important in the long run was obviously the development of internet-related industries.[44] Similarly, in the late 1970s through 1980s many nations subsidized their supercomputing industries — presuming that larger, faster computers were the future.[45]. That assumption was incorrect: the tiny personal computer became ascendant over the 1980s, and the supercomputer industry floundered.[46]

3. *Capture and Corruption.* The previous point assumed a well-intentioned decision-maker with integrity. However, anyone in the business of handing out money has the inherent potential to become captured or corrupted. Capture refers to the case of an agency becoming partial to the views of those it is meant to regulate.[47] Capture can be subtle — the result, for example, of an informational environment that is biased so that an agency cannot help but give weight to certain costs or see things in a certain way.

Corruption, meanwhile, is the buying of government aid. Industrial policy can become a tool of patronage and reward, where subsidies are given in exchange for campaign donations or cash payments to the official. In Brazil over the 00s, for example, Brazilian National Economic Development Bank head Guido Mantega made aid loans contingent on the payment of large (multi-million dollar) bribes to his personal bank [48]. Decisions made on the basis of corruption or capture are at high risk of being suboptimal.

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[43] COUNCIL OF ECON. ADVISORS, ECONOMIC REPORT OF THE PRESIDENT 180 (1993).

[44] *See* James Manyika and Charles Roxburgh, *The great transformer: The impact of the Internet on economic growth and prosperity*, MCKINSEY & CO. (Oct. 2011), https://www.mckinsey.com/~/media/mckinsey/industries/technology%20media%20and%20telecommunications/high%20tech/our%20insights/the%20great%20transformer/mgi_impact_of_internet_on_economic_growth.pdf.

[45] *E.g.*, John Markoff, *Supercomputing's New Idea Is Old One,* N.Y. TIMES, Aug. 4, 2003, at C1. ("Up until the 1980's, the United States government viewed supercomputing as part of its technological competition with the Soviet Union and Japan, heavily subsidizing research and development.").

[46] Tim Wu, *Tech Dominance and the Policeman at the Elbow*, AFTER THE DIGITAL TORNADO 81, 91 (Kevin Werbach ed., 2020).

[47] Ernesto Dal Bó, *Regulatory Capture*, 22 OXFORD REV. ECON. POL'Y 203, 203 (2006).

[48] Cao Yin, *Former bank vice-president pleads guilty to bribery*, CHINA DAILY, https://www.chinadaily.com.cn/a/202502/14/WS67af352fa310c240449d55f2.html (last updated Feb. 14, 2025, 8:21 PM).

4. *Poor execution.* The practice of industrial policy is challenging and even well-intended efforts can be victims of poor execution. While China's late 20th century and 21st century industrial policy is considered highly successful by many, its early iterations were less well executed. China's "Great Leap Forward" provides a good example of poor execution.

The Great Leap Forward, conducted from 1958-1962, can be described as an industrial policy whose goal was achieving self-sufficiency (import substitution) and rapid increases in industrial output. As Mao Zedong said, speaking of steel production: "we may possibly catch up with Great Britain in seven years. Add another eight years and we will catch up with the US."[49] To Mao's credit, there was reason to think that industrialization would benefit the largely agricultural Chinese economy of the late 1950s.

The execution, however, was extremely poor. The program was strongly influenced by Maoist doctrine which mandated abolishing private property, collectivizing farming, and, in the name of self-sufficiency, an unwillingness to rely on foreign experts.[50] Most agree that the Great Leap Forward was highly unsuccessful. Steel production, to take one example, was unimpressive, and the collectivization of farming and divergence of farmers to heavy industry greatly diminished agricultural output [51] One result was a series that famines estimated to have killed over 20 million Chinese citizens.[52]

Antitrust as Industrial Policy: Mechanisms

Antitrust policy has not usually been included within even the recent broader conception of industrial policy for various reasons. Some are more superficial. As government action, antitrust enforcement does not take the form of a tariff or export subsidy, and is not explicitly trade-oriented, and therefore does not fit the classic model. It proceeds by litigation, often lengthy, which can be unfamiliar as a form of economic strategic. But probably the most important reason is that antitrust has a negative valence, being the prosecution of firms for anticompetitive acts. At a superficial level, therefore, antitrust law looks not like industry aid but something close to the opposite.

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[49] Mao Zedong, Chairman, Chinese Communist Party, Speech at the Conference of Heads of Delegations to the Second Session of the Eighth Party Congress (May 18, 1958), *in* 8 SELECTED WORKS OF MAO TSE-TUNG 101, 106 (2020).

[50] Clayton D. Brown, China's Great Leap Forward, 17 EDUC. ABOUT ASIA, Winter 2012, at 29, 30.

[51] Basil Ashton et al., *Famine in China, 1958-1961*, 10 POPULATION DEV. REV. 613, 625 (1984).

[52] *Id.* at 614.

This view helps explain why antitrust and industrial policy have a misunderstood relationship and are assumed to be in conflict. The leading paper making that claim is by D. Daniel Sokol, who asserted in 2015 that "industrial policy is fundamentally in tension with promoting consumer welfare and fostering long-term economic growth."[53] That claim, however, is based a very narrow definition: "industrial policy means political interference either within antitrust or from outside of antitrust … in which economic analysis that is not based on antitrust economics may shape antitrust enforcement."[54] Sokol's claim is really about the dangers of political interference with antitrust enforcement (a matter discussed below). It a point complementary to this paper, and not an examination of the role antitrust might play in promoting national competitiveness.[55]

Antitrust should instead be considered an alternative means of strengthening an industry. Subsization is one approach, but there is more than one way to strengthen an industry. By analogy, consider that the Olympic athlete training for an event. She or he will need both care and feeding but will also need to train by being challenged by suitable opponents. In fact, it is often the case that young athletes will relocate so as to train with sufficiently talented opponents. Lionel Messi moved to Barcelona as a teenager to train against more elite players.

In the economics literature, this point is made by theoretical and empirical work on the relative performance of competitive and monopolized industries.[56] On the theory side, most economists agree that innovation is strongly linked to economic growth, and that firms facing competition to produce a given new product tend to try harder to win (as in the case of several firms racing to product a patented product).[57] There is also broad agreement that firms already facing competition invest in efforts to reduce the costs of their products. While firms may be deterred by the prospect of competition by a

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[53] D. Daniel Sokol, *Tensions between Antitrust and Industrial Policy*, 22 GEO. MASON L. REV. 1247, 1247 (2015).

[54] *Id.* at 1248.

[55] More recent accounts are more balanced. More recent work is more balanced. Audrey Stienon and Daniel Hanley call antitrust "an essential component of industrial policy strategies" because it helps "ensure that market actors do not undermine the government's policy goals." Audrey Stienon & Daniel Hanley, *Coordinating Market Actors for the Public Good* 5 (May 21, 2025), https://ssrn.com/abstract=5271542.

[56] Jonathan Baker, *Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation*, 74 ANTITRUST L. J. 525 (2007); Peter Howitt, *Endogenous Growth, Productivity and Economic Policy: A Progress Report*, 8 INT'L PRODUCTIVITY MONITOR 3, 10 (2004).

[57] *E.g.*, Joseph F. Brodley, *The Economic Goals of Antitrust: Efficiency, Consumer Welfare, and Technological Progress*, 62 N.Y.U. L. REV. 1020, 1026 (1987); Herbert Hovenkamp, *Antitrust and Innovation: Where We Are and Where We Should Be Going*, 77 ANTITRUST L.J. 749, 751 (2011); Tim Wu, *Taking Innovation Seriously: Antitrust Enforcement If Innovation Mattered Most*, 78 ANTITRUST L. J. 313, 313 (2012).

wealthier rival, this can lead to other forms of competition, like the creation of differentiated products. The bottom line is an expectation that a competitive industry will perform better. It is in this sense that the training metaphor fits.

Antitrust Mechanisms of Action

When we speak of antitrust acting as a form of industrial policy, there are several mechanisms of actions that are of relevance to the potential strengthening of an industry. It may be useful to review some basics of antitrust law and its operation.

Antitrust, generally speaking, targets both conduct and structure. In terms of conduct, it targets collusion -- agreements not to compete -- and the abuse of monopoly power. As a matter of structure, it seeks to prevent mergers that would reduce competition or tend to create a monopoly.

Banning anticompetitive collusion. Preventing companies from agreeing not to compete is a central project for the law. Agreeing not to compete on metrics like price or quality is more profitable for most groups of companies. The easier path of collusion quite obviously yields reduced discipline or training for the relevant firms.

Control of Industry Structure. More complex yet no less important are antitrust's structural interventions. Merger policy is the obvious intervention – the blocking of mergers that would yield monopoly or a tight oligopoly. On the assumption that competition influences innovation and growth, inventions to determine market structure are one mechanism by which the antitrust may serve a state's interest in promoting growth in an industry.

Lowering exclusionary effects / reducing barriers to entry : Exclusionary conduct is a main target of Section 2 of the Sherman Act. As stated in *Microsoft,* a firm violates the Sherman act by "engaging in exclusionary conduct 'as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident.'"[58] What counts as "exclusionary" may be subject to debate; that same court defined it as conduct which is "anticompetitive" and "harm[s] the competitive process."[59]

If we take exclusionary conduct to be that which is designed to keep market entrants (without benefit), whether in new or in adjacent industries, another mechanism of antitrust action becomes clear. The blocking of such exclusionary effects is a means of promoting entry, which is a mechanism of promoting both innovation and competition.

[58] United States v. Microsoft Corp., 253 F.3d 34, 58 (D.C. Cir. 2001).
[59] *Id.*

By stripping the monopolist of its defense mechanisms, it provides room for entrants to introduce new products or services.

Compulsory Licensing of Intellectual Property. Among the various remedies imposed in antitrust actions is the compulsory licensing of intellectual property. Such remedies are not uncommon as a means of settling challenges to mergers. In addition, they have been used in anti-monopoly cases.[60] For example, in a 1956 consent decree, AT&T agreed to license nearly all of its existing patents on a royalty-free basis.[61] In a 1975 consent decree, Xerox was required to license its patents over the photocopier.[62] As described below, both remedies yielded well-studied innovations in a number of industries, including semiconductors and copiers. As against the argument that such licensing eliminates incentives to innovate, a range of studies suggest the opposite: that industry innovation either improved or was unaffected by the licensing.

Breaking Vertical Ties / Unbundling. Another remedy imposed in some antitrust cases or through antitrust rulemaking is the breaking of a vertical tie between two products.[63] An example is the 1977 eyeglass rule, which forced the unbundling of the eye examination services from the sale of glasses,[64] or the 2022 hearing aid rule, which sought to open the market for over-the-counter hearing aids.[65] Both rules are examples of an intervention to change the vertical as opposed to the horizontal structure of industry.

Effects of Intervention

If successful, antitrust interventions may yield the following effects for an industry, as relevant for industrial policy.

Improved production efficiency. An intervention that sustains horizontal competition can force industry members to improve their production efficiency. The

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[60] Colleen V. Chien, *Cheap Drugs at What Price to Innovation: Does the Compulsory Licensing of Pharmaceuticals Hurt Innovation?*, 18 BERKELEY TECH. L. J. 853, 862 (2003).

[61] Martin Watzinger et al., *How Antitrust Enforcement Can Spur Innovation: Bell Labs and the 1956 Consent Decree*, 12 AM. ECON. J.: ECON. POL'Y. 328, 329 (2020).

[62] Timothy F. Bresnahan, *Post-Entry Competition in the Plain Paper Copier Market*, 75 AM. ECON. REV. 15, 15 (1985).

[63] See Tim Wu, *Antitrust via Rulemaking: Competition Catalysts*, 16 COLO. TECH. L. J. 33, 49 (2017).

[64] Advertising of Ophthalmic Goods and Services, 43 Fed. Reg. 23,992 (June 2, 1978) (to be codified at 16 C.F.R. pt. 456).

[65] Establishing Over-the-Counter Hearing Aids, 87 Fed. Reg. 50,698 (Aug. 17, 2022) (to be codified at 21 C.F.R. pts. 800, 801, 808, & 874).

inability to escape competition through a merger, for example, may lead the members of an industry to compete on efficiency groups to improve their margins.

Product Differentiation. Forcing firms to compete may also yield product differentiation (or innovation to differentiate products) as a means of escaping the rigors of direct competition.

Incentivizing Market Entry or the formation of new firms. Some antitrust remedies, like the compulsory licensing of intellectual property, may incentivize either the formation of new firms or other forms of market entry. One example of this effect followed the 1956 AT&T consent decree which required AT&T to license nearly all of its patents for free, including its valuable transistor patent.[66] Another example, also involving AT&T, was the market entry of various firms in the "device" market after antitrust remedies paired with regulation created protection for firms who produced devices to be connected to phone lines.[67] One direct effect of that consent decree was the market entry of a large number of firms manufacturing devices that attached to phone lines, like fax machines, answering machines, and computer modems.[68]

Protection of nascent competitors. A related effect takes the form of aid or protection of nascent competitors who may be in adjacent markets. A monopolist may want to prevent the growth of firms in markets adjacent to its monopoly, on the risk that they come to compete with the monopoly, or for other reasons, like the desire to dominate an entire sector. An example was Microsoft's approach to the browser market in the 1990s, when it feared a possible, eventual challenge to its platform monopoly from browsers.[69] The antitrust case against Microsoft and the subsequent oversight over Microsoft provided protection to future browsers and also to firms that were innovating on top of the browser as a platform.[70]

Unsuccessful effects of antitrust interventions might include the following negative effects from an industrial policy perspective:

Denial of Necessary Scale. An antitrust remedy, such as the blocking of a horizontal merger, might deny a firm necessary scale to compete in international markets. Imagine, for example, that the production of steel at a competitive price in international markets requires a minimal scale, and that two smaller steel companies

[66] Watzinger et al., *supra* note 68, at 329.
[67] TIM WU, THE MASTER SWITCH 113 (2010).
[68] *Id.* at 190.
[69] TIM WU, THE CURSE OF BIGNESS 98-100 (2018).
[70] Richard Blumenthal & Tim Wu, Opinion, *What the Microsoft Antitrust Case Taught Us*, N.Y. TIMES (May 18, 2018), https://www.nytimes.com/2018/05/18/opinion/microsoft-antitrust-case.html.

seek to merge to reach that scale. An theoretical antitrust remedy that blocked a merger seeking scale in this manner might have a negative effect from an antitrust perspective, assuming the

Free Riding by Foreign Competitors. The effort to open a domestic market to competition might serve as a bounty to foreign competitors. For example, requiring the free licensing of intellectual property might give a company from another country an opportunity to develop a competitive product more quickly than in the absence of the remedy.

Public Choice Considerations

We have described several public-choice related challenges that traditional industrial policy can face. This is not to describe them as insurmountable, but to take seriously the informational and other challenges that face the successful deployment of government intervention. This section argues that antitrust, as a mechanism, has certain advantages from a public choice perspective.

Information-forcing Mechanisms. The blocking of a merger or a conviction for a violation of the Sherman Act requires presentation of significant evidence probative of anticompetitive effects, or their future likelihood (in the case of a merger).[71] That requires, in the usual case, an intensive and adversarial investigation whose goal is the finding of evidence that is probative of exclusionary effects or negative effects on competition. In a rule of reason case, the plaintiff must demonstrate competitive harm. The particular need to document effects (or predicted effects) before a court limits completely arbitrary or corrupted decisions.

Lobbying Dynamics. Unlike a subsidy or a tariff, becoming the target of an antitrust investigation is taken as unwanted and undesirable. Antitrust action therefore does not fit George Stigler's 1971 model as something for which an industry might effectively and collectively pay for, as in the case of favorable regulation.[72] It is true that one or more member of an industry might seek the investigation of a rival. Private efforts to influence government are not irrelevant in the antitrust space. But it is an adversarial contest, which differs from what one might expect in the seeking of, say, a subsidy for all members of the industry.

[71] United States v. Microsoft Corp., 253 F.3d 34, 58 (D.C. Cir. 2001).

[72] *See generally*, George. J. Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON. & MGMT. SCI. 3 (1971).

In the case of Section 2 investigations, it is often (not always) the case that monopoly investigations involve a large firm targeting a small firm, as in AT&T attack on MCI in the 1970s,[73] the IBM exclusion of Control Data,[74] or the Microsoft attack on Netscape.[75] In such a case, the adversarial process creates some equality of arms as between firms with very different levels of resources.

No Loser's Paradox. If traditional industrial policy tends to too often favor industries in decline, there is no particular reason to expect anti-competitive conduct or investigations to focus on such industries. Instead, there is a general tendency, in antitrust cases to focus on industries with higher levels of growth and profit. That follows because those are the industries able to have a monopoly profit to defend or maintain, or the industries with enough growth prospects to merit investments in acquisitions. This is by no means an absolute tendency, especially in the case of mergers. Two companies in decline may merge in hopes of taking on a rising competitor, as was the stated rationale for the Time-Warner - AT&T merger in the 2010s.[76] The point, however, is there is less reason to expect aid to industries in decline through the operation of the antitrust law.

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We have discussed how antitrust might serve as a tool of industrial policy. In what follows is a qualitative analysis of four U.S. tech industries who were differentially treated by the antitrust laws.

[73] MCI Commc'ns Corp. v. Am. Tel. & Tel. Co., 462 F. Supp. 1072 (N.D. Ill. 1978).
[74] Control Data Corp. v. Int'l Bus. Machs. Corp., 306 F. Supp. 839 (D. Minn. 1969).
[75] *Microsoft*, 253 F.3d at 34.
[76] United States v. AT&T Inc., 310 F. Supp. 3d 161, 164 (D.D.C. 2018).

Part II

Four U.S. Tech Industries: Aerospace, Automotive, Computing and Telecommunications

The second part of this paper compares four important tech industries that were new and developing industries in the 20th century: Aerospace, Automotive, Computing, and Telecommunications. It studies these industries from the 1960s through early 2000s. None of these industries could be said to exist in meaningful form in the 19th century. Each gained their feet and developed over the 20th century while remaining significant today.

The industries had many things in common. Each was dependent on major technologies invented during the 20th century, including the jet engine and airfoil, the transistor and silicon semiconductors, advanced signal transmissions and fiber-optic cables, to name a few. Each industry had some level of government support, whether in the form of research funding, U.S. defense contracting or infrastructure spending.[77] Each was understood to be a scale industry, and evolved into a monopoly, duopoly or trio-poly form by the 1960s — taking the form of the familiar firms like Boeing, McDonnell Douglas, GM, Ford, IBM, and AT&T.

One major difference in their histories, however, concerns antitrust treatment. The computing and telecommunications industries were subject to repeat and intensive enforcement by the U.S. Justice Department. There were aggressive campaigns to break up the main monopolies in both industries over the 1970s.[78] In the case of aerospace and automotive, the approach was the opposite. Automotive and aerospace were granted a *de facto* immunity to antitrust, at least in their core markets, and came to be seen as national champions.[79]

The industries' respective structural trajectories diverged strongly from the 1970s onward, both in terms of structure, industrial succession, innovation and growth. The telecommunications and computing industries became subdivided into multiple vertical industries. In computing, that would come to include the computers themselves, a separate software industry, a semiconductor industry, and various periphery industries

[77] *See infra* notes 102-104, 146, 212, 271 and accompanying text.

[78] THOMAS J. WATSON JR. & PETER PETRE, FATHER, SON, AND CO.: MY LIFE AT IBM AND BEYOND 376-89; TIM WU, THE CURSE OF BIGNESS 94-95 (2018).

[79] CRAY, *supra* note 11, at 445; Luz, *supra* note 12, at 162.

(hard drives, printers, modems, and so on). This situation was first described as "divided technological leadership" by economist Timothy Bresnahan in the 1990s.[80] In telecommunications, the main monopolist was divided into 8 firms but also divided into separate vertical industries.[81] By the 1990s there was a long-distance industry, a device industry, and then a "dial-up" and internet service provider industry, and mobile industry.[82] The firms that dominated industry in the 1960s (AT&T and IBM) remain in existence but can no longer be described as dominant, even by a partisan.

The structural story of the automotive and aerospace industries is different. The structure extant in the 1960s remains largely intact. There has been limited domestic industrial succession: the dominant U.S. firms of the 1950s (GM,[83] Ford,[84] and Boeing[85]) remain the major domestic firms by volume and revenue. The growth of adjacent industries has not been significant compared to computing and telecom. It is difficult to speak of a divided technological leadership in these industries.

Apart from telecommunications, each of these industries also faced significant foreign competition beginning in the 1970s. The automotive and aerospace industries witnessed the successful market entry of foreign competitors (firms like Toyota[86] and Airbus[87]) who captured large parts of the domestic market. Computing also witnessed the market entry of foreign firms (e.g., NEC, Sinclair, and Toshiba); but the domestic computing industries ultimately retained their dominance. The bottom line is that computing and telecommunications ended up with far more decentralized structures than the aerospace and automotive industries and managed to hold a larger domestic market share.

The telecommunications and computing industries also underwent far more growth and innovation from the 1960s onward, by a variety of standard measures. A study of economic growth over period 1960-2007 by Dale W. Jorgenson and co-authors finds that computing, telecommunications and related fields grew twice as fast as the

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[80] Timothy F. Bresnahan, Shane Greenstein, *Technological Competition and the Structure of the Computer Industry*, 47 J. INDUS. ECON. 1, 3 (1999).

[81] TIM WU, THE MASTER SWITCH 194 (2010).

[82] TIM WU, THE CURSE OF BIGNESS 97 (2018).

[83] *Automobile & Light Duty Motor Vehicle Manufacturing in the US*, IBISWORLD (July 2025), https://my.ibisworld.com/us/en/industry/33611/at-a-glance.

[84] *Id.*

[85] *Aircraft, Engine & Parts Manufacturing in the US*, IBISWORLD (Aug. 2025), https://my.ibisworld.com/us/en/industry/33641a/at-a-glance.

[86] Cox Automotive Forecast, COX AUTOMOTIVE (Dec. 17, 2024), https://www.coxautoinc.com/news/cox-automotive-forecast-dec-2024-u-s-auto-sales-forecast/.

[87] *Global Commercial Aircraft Manufacturing*, IBISWORLD (Apr. 2025), https://my.ibisworld.com/gl/en/industry/c2543-gl/at-a-glance.

entire economy over that period, while automotive grew more slowly and aerospace grew much more slowly.[88]

Fig 2. Economic Growth in Various Industries 1960-2007

Total economy: 3.45%/year

Computing & software: ~20–35%/year
Telecom/IT services: ~6–8%/year
Automotive: 2.4%/year
Aerospace & related: 1.2%/year

Historical causation is complex, and it certainly cannot be claimed that differential government attention was the single factor that made the difference. This paper is an invitation for further comparative and emipircal studies of different tech industries. Instead, we might well example several competing explanations for what made these tech- industries developed differently from the 1970s onward.

One explanation is that forceful antitrust interventions played a role by reducing the costs of market entrants, startups, and rivals. This, the theory goes, had effects on both principal and adjacent markets. For example, the unbundling of software and the neutrality rules imposed on the telephone system, the theory goes, created opportunities for software firms[89] and online services,[90] yielding decentralization.

A second explanation gives more credit to the underling technological reality and room for growth. It may have been that aerospace and automotive were inherently less likely to experience disruptive innovation and industrial succession, while there was there was something inherent to telecommunications and computing that made greater innovation and decentralization inevitable. There may also have been more room for growth in computing in telecommunications – more industries adjacent to the main industry receptive to expansion.

A final explanation of the divergence would posit that the superior management of AT&T and IBM accounts in part for the difference in outcomes. The theory is that the managers of those firms, unlike the executives of General Motors and Boeing, accepted that allowing more room for competitors or new firms in adjacent adjacent industries would be a wiser course.

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[88] Dale W. Jorgenson et al, Information technology and U.S. productivity growth: evidence from a prototype industry production account, J Prod Anal (2011) 36:159–175.
[89] Grad, *supra* note 13, at 70-71.
[90] TIM WU, THE MASTER SWITCH 191 (2010)

We shall return to an assessment of these explanations at the end of the case studies.

1. The U.S. Automobile Industry from 1960 – 2010

The US automobile industry, like the others, was a beneficiary of U.S. federal policy, including infrastructure spending (most notably, the 1956 Interstate Highway Act and subsequent spending on highways).[91] It was also, like the computing and telecommunications industry, the subject of antitrust investigation and attention. However, unlike those industries, it was never subject to a major antitrust lawsuit designed to restructure the industry. Compared with computing or telecommunications, there were fewer efforts to limit the control of the main car firms (especially GM) over adjacent industries, like the bus or consumer credit industries.

Early history

The U.S. automotive industry emerged as a cottage industry in the 1900s with dozens of small manufacturers. By the 1910s-1920s, Ford, a pioneer of mass production and the assembly line, had emerged as the leader, followed by General Motors and about dozen other manufacturers, including Studebaker, Hudson, Maxwell, [92] and others. By process of attrition and consolidation, a "big three" of automakers had emerged by the 1930s."[93] World War II, which halted civilian production of automobiles, increased the dominance of the industry by the three major manufacturers. Notably, in the immediate post-war period the automotive companies — especially General Motors — were thought by some to be models of American corporate efficiency. Peter Drucker, the management professor famously praised GM's management structure in his 1946 book *The Concept of the Corporation.*[94]

By the late 1950s the industry had tightened even further, and the U.S. Government grew concerned that General Motors was monopolizing the car industry. By the late 1950s the state of concentration in the US automative industry yielded a series of antitrust subcommittee hearings, run mainly by Estes Kefauver, a Senator with a longstanding interest in antimonopoly policy.[95]

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[91] Federal-Aid Highway Act of 1956, Pub. L. No. 84-627, 70 Stat. 374.

[92] THE AUTOMOBILE INDUSTRY, 1896-1920 at xxi (George S. May ed., 1990).

[93] Int'l Shoe Co. v. FTC, 280 U.S. 291, 302 (1930).

[94] PETER DRUCKER, THE CONCEPT OF THE CORPORATION (1946).

[95] *Administered Prices. Part 6: Automobiles: Hearings Before the Subcomm. on Antitrust and Monopoly of the S. Comm. on the Judiciary*, 85th Cong. (1958) [hereinafter *Automobile Hearings*].

At the hearings, the main members of the U.S. car industry were shown to have cabined and limited competition. A series of witnesses and documents established a loose price coordination arrangement led by General Motors that prevented significant price competition.[96] (Witnesses testified that Ford and Chrysler set their prices by waiting for GM to set its prices and then copying them).

Among the most prescient witnesses in the late 1950s hearings was George Romney, who had been the President of the Automobile Manufacturers Association and President of American Motors, a firm at the fringe. Romney argued that a lack of competition in US automotive was a long-term threat to the industry's competitiveness. As he put it: "There has not been enough competition in the automobile business in the United States," he testified, "to compel the Big Three to keep their products as modern in this country."[97]

Romney believed that the Big Three had become too heavily invested in the building large and luxurious cars, and were neglecting the market for smaller cars that cost less.[98] He singled out General Motors, the industry leader, for "perpetuat[ing] an archaic and old-fashioned product concept."[99] He believed that the U.S. needed room for smaller, innovative carmakers, as "the smaller companies historically have been the principal innovators."[100] He warned that foreign competitors were ahead in the development for small cars, despite the fact that, at the time, foreign cars made up just 1% of the U.S. domestic market.[101]

Influenced by these hearings, over the 1950s and 1960s the Justice Department brought a series of antitrust suits against General Motors. One suit, filed in 1956, accused GM of monopolizing the markets for transit and intercity buses.[102] Another, filed in 1959, sought to reverse GM's acquisition of a firm in the off-road earth-moving industry and a third, filed in 1961, accused GM of monopolizing the market for locomotives.[103]

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[96] *Id.* at 2408.
[97] *Id.* At 2849.

[98] *See Id.* at 2847.

[99] *Id.* at 2879.

[100] *Id.* at 2873.

[101] *Id.* at 2848.

[102] CRAY, *supra* note 11, at 445-46.
[103] *Id.* at 446-47.

But the big case — the automobile monopolization complaint — remained in preparation for a long time. It would have been a lawsuit seeking the breakup of General Motors' core business, the production of automobiles.[104] During the Eisenhower and Kennedy administrations the Justice Department assigned lawyers to draft the complaint against General Motors, which had grown to occupy 55% of the US market.[105] Robert Kennedy as Attorney General, was widely expected to file an antitrust suit developed by the Eisenhower Administration. According to the *Wall Street Journal*) the complaint was reached 104 pages and consisted of a serial monopolization case that addressed more than 40 of GM's mergers.[106] Its main remedy would have been the divestiture of Chevrolet from the rest of GM.[107]

The complaint, however, was never filed.[108] Agencies are not required to explain a non-enforcement decision, so the reason for the decision is unknown and necessarily a matter of speculation. One reason may have been the risk of losing in court. Given the fact that the car industry was comprised of three main players, any monopolization complaint would necessarily depend on either a shared-monopoly theory (under Section 2 of the Sherman Act) or a Section 7 serial monopolization theory.[109] Those were untested theories and may have explained the reluctance of Donald Turner, then the head of the antitrust bureau, to file the suit. Another possibility is that the politics of filing to break up GM were just seen by the Johnson Administration as unattractive. The *Wall Street Journal* reported that President Johnson had reserved for himself the decision of whether to file suit.[110] Turner, however, said to the *New York Times* that the case decision never reached the White House.[111]

It is also the case that, during this period, Congress passed the National Traffic and Motor Vehicle Safety Act, as championed by Ralph Nader and other prominent consumer advocates.[112] It seems plausible that the Johnson Administration considered safety regulation (as championed by public interest groups) to be a greater priority than antitrust enforcement. It may have decided that if the Administration was going to do one thing to the automotive industry this would be it. Whatever the reasons, unlike in

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[104] *Id.* at 445.

[105] *State of Business: The Profits Paradox*, TIME (May 4, 1962), https://time.com/archive/6623528/state-of-business-the-profits-paradox/.

[106] *Id.* at 444-45.

[107] *Id.* at 444.

[108] *Id.* at 445.

[109] *See id.*

[110] Louis M. Kohlmeier, *Antitrust Bombshell*, WALL ST. J., Oct. 31, 1967 at 1.

[111] NY Times

[112] National Traffic and Motor Vehicle Safety Act of 1966, Pub. L. No. 89–563, 80 Stat. 718.

the computing and telecommunications industries, no big monopolization case was ever filed against General Motors or any of the other main U.S. automotive firms.

The 1970s, decline of the U.S. industry and rise of the small car and foreign competitors.

As George Romney predicted in the 1950s, small cars proved to the Achilles heel of the American car industry. In the 1960s and early 1970s, European (Volkswagen) and then Japanese small cars began gaining traction in U.S. markets.[113] Meanwhile, the U.S automotive industry began a long decline, both in terms of its domestic and world market share as compared with its foreign competitors. In 1950 the US was producing some 80% of the world's automobiles; by 1981 that number had fallen below 30%.[114] The problem might best be described as a classic innovator's dilemma. The large cars pioneered by the U.S. industry had been a great success in the 1950s, and the major US carmakers proved unenthusiastic about adjusting to changing tastes over the next few decades.

From the many insider accounts several factors are obvious. First, that domestic competition during this era centered on "styling competition.[115] That phrase refers to a focus on annual changes in brand styling and external decoration, and the avoidance of more fundamental changes to the American automobile. Second, it is clear that the U.S. industry took smaller cars as unserious and unworthy of significant attention. As Vermont Royster wrote "the auto industry remained unruffled by the innovative imports from Volkswagen or Toyota until they became a flood. It simply sat by and let a good part of the market, at home and in the world, be taken away from it.[116] A certain ideological rigidity seemed to prevent U.S. automakers from taking small cars seriously. The U.S. car industry, according to Brock Yates, author of *The Decline and Fall of the American Automobile Industry* Brock, viewed customers for small cars as "anarchists, Wobblies, One-Worlders, crackpot intellectuals, counterculture revolutionaries, and consumerist zanies"[117]

It is true that both General Motors and Ford did produce cars in the early 1970s specifically meant to ward off the challenge of Japanese imports. However, neither of the cars meant to do so, the Chevrolet Vega and the Ford Pinto, were successful.[118]

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[113] BROCK YATES, THE DECLINE AND FALL OF THE AMERICAN AUTOMOBILE INDUSTRY 112-13 (1983).

[114] *Id.* at 15.

[115] *Id.* at 2450.

[116] CRAY, *supra* note 11, at 525.

[117] YATES, *supra* note 173, at 92.

[118] *Id.* at 113-15.

The Chevrolet Vega suffered in its design process from GM's creeping centralization of decision-making. GM had once been famous for its decentralized corporate design: it maintained Chevrolet, Pontiac, Oldsmobile, Buick and Cadillac as separate operations within a larger company.[119] That structure managed in certain ways to harness the advantages of competition within a larger company. But by the mid-1960s, a new generation of leaders at GM sought to centralize authority, and the approach to small cars ended up being a victim.[120]

Three GM units in the mid-60s had decided to develop a small, low-cost car to compete with foreign imports. Corporate leadership, to eliminate duplicate development efforts, killed two of the projects, and then ordered Chevrolet to develop a prototype known as the XP-88.[121] There was obviously some logic to focusing efforts on one project; yet it brought along the risk of betting on one horse. The horse in question, the Chevrolet Vega was "blighted by infuriating oil leaks, warped cylinder heads, rusted bodies and rattles as well as a harsh ride, problems with rust and engine fires.[122] It did not sell well.[123] The Ford Pinto was also unsuccessful, but for different reasons.[124] The Pinto was built on a rushed design schedule, and Ford also famously chose a more dangerous gasoline tank design to save $11 per car. The widely-reported tendency of the car to burst into flames after relatively low-speed collisions damaged Ford's reputation.[125]

Japanese automakers began the 1970s with fewer resources, lower sales and less advanced technologies than the American firms. But the major Japanese carmakers innovated strongly over the 1970s and captured increasing shares of the US market.[126] The Honda Civic, introduced in 1973, was reliable and extraordinarily fuel-efficient and sold well, as did the Toyota Corolla.[127]. Other successful models included the Datsun 510 and the Honda Accord.[128]

What accounts for these differing track records of innovation over the 1970s? A plausible explanation comes from economist Jon Baker who argues that the Japanese carmakers saw limited growth opportunities the large car market, and therefore invested

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[119] DRUCKER, *supra* note 150, at 41-42.
[120] *See* CRAY, *supra* note 11, at 448.
[121] *Id.* at 471-72.
[122] *130,000 Vegas Recalled By G.M. for Fire Hazard.*, N.Y. TIMES, Apr. 5, 1972, at 90.
[123] CRAY, *supra* note 11, at 474.
[124] Mark Dowie, *Pinto Madness*, MOTHER JONES, Sept.-Oct. 1977.
[125] YATES, *supra* note 173, at 115.
[126] THE AUTOMOBILE INDUSTRY, 1920-1980, 220-21 (George S. May ed., 1989).
[127] THE AUTOMOBILE INDUSTRY, 1920-1980, *supra* note 189, at 220.
[128] Nissan Heritage Collection spotlight: Datsun 510, NISSAN STORIES (Apr. 5, 2023), https://usa.nissanstories.com/en-US/releases/nissan-heritage-collection-spotlight-datsun-510.

heavily in small car innovation to escape competition from where U.S. manufacturers had the advantage.[129] The U.S. manufacturers, with most of their revenue and profits in large cars where competition remained weak (between the big three) saw little real need to escape competition by investing in small-car innovation, and therefore simply devoted less time and effort to it.[130]

Another explanation is more cognitive in nature. Author Brock Yates, in *The Decline and Fall of the American Automobile Industry* chronicles what he called "Detroit Mind."[131] Leadership, he argued, "placed a premium on cultural conformity."[132] He quotes a former manager on the innovation process over the 1960s: "each annual model change was evaluated against one major standard—last year's car. They never, ever considered the competition of foreign cars. The senior engineers and management would all go out to the Milford Proving Grounds and first they'd drive the previous year's Olds model. Then they'd try the upcoming model. If it was slightly better than the old one, they were satisfied."[133]

Hindsight is 20/20 but there is reason to believe, and some have argued, that forcing General Motors and/or Ford to break into smaller firms would have been a successful industrial policy for the U.S. automotive industry over the 1960s.[134] There is a number of reasons that a breakup might have served the United States. From an innovation theory perspective the divested firms would have, in theory, been in a similar position to the European and Japanese competitors: i.e., small fish in a big industry with an incentive to escape competition by investing in innovating in the small-car market.

Second, a breakup might have helped with the decision-making problems facing Detroit in the 1970s — best characterized by an insularity and a strong attachment to doing things as they'd always been done. The U.S. industry might have on an earlier timeframe, broken from model that called for making an easy profit with big cars and styling competition — or as author Brook Yates memorable put it, the "industry's divinely mandated role of building large cars for real Americans."[135]

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[129] Jonathan B. Baker, *Fringe Firms and the Incentive to Innovate*, 63 ANTITRUST L. J. 621, 625 (1995).

[130] *See id.* at 638-639.

[131] YATES, *supra* note 173, at 82.

[132] *Id.* at 88.

[133] *Id.* at 89.

[134] What if GM and Ford were broken up in the 1960s?, INDIE AUTO (Dec. 11, 2024), https://www.indieauto.org/2024/12/11/what-if-gm-and-ford-were-broken-up-in-the-1960s/.

[135] YATES, *supra* note 173, at 116.

Government policy: Shift to a National Champion Model

When, in the 1950s and early 1960s, the United States had the most successful car industry in the world, the federal government had significant interest in using antitrust to increase competition. However, as the industry began to face rising foreign competition in the 1970s, both industry and the federal government changed to a more defensive stance. Government began seeking to protect the industry from foreign competition to allow it to "retool" meet demand for smaller cars.

By the 1970s, General Motors began to argue that the concentration of the U.S. car industry was necessary to fight the challenge of foreign car makers. It pointed out that nations like France or Japan had their own "big 3" or "big four."[136] By the 1980s, as imports rose to take thirty percent of the US domestic market, federal policy became more firmly driven by an interest in protecting the industry as opposed to making it more competitive.[137] In reaction to a few disastrous years in the late 1970s — when the American neglect of the small-car market began to bear fruit — the economic leadership of the Carter Administration began to agree with unions and industry that American car manufacturers needed help.[138]

It was the Reagan administration, however, that moved more the United States most firmly to the national champion model. During the early years of the Reagan Administration, the Senate introduced quota legislation that would have imposed hard limit of 1.6 million units on imports of Japanese automobiles for at least three years.[139] While that rule would have violated the relevant trade treaty (the GATT), which banned quotas, the Administration found a work-around.[140] It convinced Japan to adopt a voluntary export restraint (VER) of 1.68 million units, and did so by relying on the imminent Congressional action as a threat.[141] That voluntary restraint lasted until 1994, when Japan abandoned it — many Japanese automakers having shifted their manufacturing to the U.S. during that time.[142]

While the US car industry had limited domestic competition, it is clear that the domestic industry ultimately faced market discipline from imported vehicles. From the

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[136] CRAY, *supra* note 11, at 447.

[137] Douglas Nelson, *The Political Economy of U.S. Automobile Protection*, *in* THE POLITICAL ECONOMY OF AMERICAN TRADE POLICY 133, 137-39.

[138] Stephen D. Cohen, *The Route to Japan's Voluntary Export restraints on Automobiles* (Am. U., Working Paper No. 20), https://nsarchive2.gwu.edu/japan/scohenwp.htm.

[139] *Id.*

[140] General Agreement on Tariffs and Trade art. XI, Oct. 30, 1947, 55 U.N.T.S. 314

[141] See Steven Berry et al., *Voluntary Export Restraints on Automobiles: Evaluating a Trade Policy*, 89 AM. ECON. REV. 400, 400.

[142] *See id.* at 417.

1970s onward the American car industry was forced to make improvements in its production processes and — in fits and starts — began making competitive small cars.[143] Nonetheless did continue a long decline. The domestic car manufacturers went from 94 percent of the total car and truck market in 1961 to less than half by 2008.[144] In that year, during the collapse of financial markets during the Great Recession (2008-10) General Motors and Chrysler declared bankruptcy, necessitating a government bailout for to recover.[145]

2. U.S. Aerospace

The American aerospace industry, while comprised of private firms, has long been the recipient of significant government assistance. As Kenneth Galbraith wrote in 1973, "firms such as Lockheed or General Dynamics, which do most of their business with the government, make extensive use of plants owned by government, have their working capital supplied by the government, have their cost overruns socialized by government... are anything but the purest manifestations of private enterprise…."[146]

In broad strokes, the U.S. aerospace industry has been subject to three forms of assistance. The first is the use of technologies originally developed for military purposes. As economist Philip Lawrence wrote in 2001: "America's historic dominance in commercial aerospace, and particularly the large commercial aircraft sector, arose on the back of defense technology paid for by the U.S. government."[147] Economists Mowery and Rosenberg argued in 1982 that "the history of technical development in commercial aircraft consists largely of the utilization for commercial purposes of technical knowledge developed for military programs at government expense."[148]

A second form of assistance was the cross-subsidization of commercial airplane manufacturers by defense contracts. Defense contracts are often lucrative, and in fact one of the US's leading passenger airplane manufacturers (Lockheed) left the

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[143] YATES, *supra* note 173, at 113-15.

[144] Joel Cutcher-Gershenfeld et al., The Decline and Resurgence of the U.S. Auto Industry, ECON. POL'Y INST. (May 6, 2015), https://www.epi.org/publication/the-decline-and-resurgence-of-the-u-s-auto-industry/ (click "data" on Figure B).

[145] Thomas H. Klier & James Rubenstein, *Detroit Back from the Brink? Auto Industry Crisis and Restructuring, 2008–11*, 36 ECON. PERSPS. 35, 38.

[146] JOHN KENNETH GALBRAITH, ECONOMICS AND THE PUBLIC PURPOSE 139 (1973).

[147] PHILIP K. LAWRENCE & DEREK BRADDON, AEROSPACE STRATEGIC TRADE at vi (2001).

[148] David C. Mowery & Nathan Rosenberg, *The Commercial Aircraft Industry*, *in* GOVERNMENT AND TECHNICAL PROGRESS 101, 140 (Richard R. Nelson ed., 1982).

passenger market in the early 1980s after assessing that military contracting was a better line of business.[149]

In benefiting government research work and government spending, aerospace has not been different than other industries described here, specifically computing or telecommunications. The big difference is a third form of aid: tepid enforcement of the antitrust laws, based on a policy of seeking to aid the American firm (Boeing) against its European competitor (Airbus).

These three practices combined yielded what Andrea Tyson called "a makeshift but nonetheless effective industrial policy." Since the late 1990s, the policies have settled into support for a single American firm: Boeing. This section explores the advantages and disadvantages of these policies.

Pre-History

In the 1920s and 1930s, US airline manufacturers began significant operations as government contractors, providing air mail and military services for the federal government.[150] The airmail market itself was new and relatively decentralized; some of the airlines providing services included Ford-Air (a division of the automotive company[151]), and vertically integrated Boeing (then known as the United Aircraft and Transport which included Boeing Air Transport).[152]

A 1934 statute barred airplane manufacturers from owning airlines, following an airmail price-fixing scandal.[153] By the late 1940s, the decentralized American industry had settled down to three main [154], Boeing, Douglas, and Lockheed. After major technological development of the aerospace industry during World War II, the United States took the lead in jet-engine passenger aircraft with the DC-9 and the Boeing 707, beginning the "jet age." By the 1970s the domestic market for passenger aircraft in the United States was a three-way competition between Boeing (737 and 747), McDonnell Douglas (DC-9 and DC-10) and Lockheed's L1011 Tristar.[155] If viewed as a global industry, by the 1970s the industry included approximately seven significant

[149] Alexander Mitchell, *Why Lockheed Stopped Making Commercial Aircraft*, SIMPLE FLYING (Feb. 27, 2025), https://simpleflying.com/lockheed-stop-making-commerical-aircraft/.

[150] F. ROBERT VAN DER LINDEN, AIRLINES AND AIR MAIL: THE POST OFFICE AND THE BIRTH OF THE COMMERCIAL AVIATION INDUSTRY 10 (2002).

[151] *Id.* at 20.

[152] *Id.* at 50-51.

[153] VAN DER LINDEN, *supra* note 106 at 277.

[154] MODERN AIR TRANSPORT: WORLDWIDE AIR TRANSPORT FROM 1945 TO THE PRESENT 11-17 (Phillip Jarrett ed., 2000) [hereinafter MODERN AIR TRANSPORT].

[155] MODERN AIR TRANSPORT, *supra* note 111 at 188.

competitors. [156]Other manufacturers over the 1970s included Franco-German Airbus (which debuted the A300 in 1970), and the BAC 1-11 (British),[157] XY (British).

Approach to Aerospace Industry Structure

Through its programs and specific actions, the United States federal government has tended to favor reduced domestic competition in the passenger aerospace industry. As stated above, in the early 1930s, the Roosevelt administration briefly experimented with nationalization of airline service (then airmail) in the Army Air Force.[158] The lucrative returns from military contracting provided another, unintended disincentive to stay in the passenger business. In the 1980s, Lockheed, the producer of a popular line of commercial airplanes (the Tristar) elected to leave the market, telling shareholders that its margins were higher in military contracting.[159]

From the late 1970s onward — after the formation of Airbus by France, Germany, Spain and Britain, and its release of the A300 — the United States federal government began to approach the airline industry as a classic case of international competition with Europe. The U.S. Export-Import bank subsidized the exports of US airlines to foreign buyers by offering favorable financing to those wishing to buy American airplanes.[160] U.S. officials pressured U.S. allies (like Japan) to buy American instead of European planes.[161]

In 1997, Boeing and McDonnell-Douglas proposed a merger to create a single domestic firm.[162] Under the standards in place at the time, given the large market shares of the firm, the merger was presumptively illegal.[163] It is notable that during time period, a structurally similar [164] merger between Staples and Office Depot in 1996 was challenged and blocked by the FTC.[165]

The White House made it clear through various fora that the Administration favored a consummation of the merger between Boeing and McDonnell Douglas, as did

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[157] *Id.* at 175-77.

[158] VAN DER LINDEN, *supra* note 106 at 277.

[159] Mitchell, *supra* note 104.

[160] Rosemary E. Minyard, *The Export-Import Bank: Implications for the Federal Budget and the Credit Market* at X (Cong. Budget Off., Staff Working Paper, 1976).

[161] *See* NEWHOUSE, *supra* note 30, at 191.

[162] Luz, *supra* at note 12, at 158.

[163] Richard A. Melcher & Catherine Yang, *Boeing and McDonnell: Will It Fly?*, BUSINESS WEEK, Apr. 12, 1995, at 36.

[165] F.T.C. v. Staples, 970 F. Supp. 1066, 1093 (D.D.C. 1997)

the Defense Department. It is not clear from the historic record whether the White House, behind the scenes, directly informed FTC officials of its views, or perhaps quietly directed the FTC not to stop the merger. But the White House certainly made its views clear through other channels, most notably through its public communications to the European Union.[166] And despite the statute, the divided Federal Trade Commission, after review, declined to take any action to block or condition the merger.[167]

In a separate statement, Chairman Robert Pitofsky preemptively denied that the Commission was adopting any form of industrial policy or trying to create a national champion.[168] Instead, the FTC relied on a version of the "failing firm" theory, suggesting that McDonnell Douglas was no longer an effective competitor.[169] It is however unlikely that McDonnell Douglas would have qualified for actual failing firm defense, which applies only if a firm would face “dim prospects” of emerging from bankruptcy.”[170] It is hard to believe that the FTC’s actions were entirely unaffected by the views of the White House and the Administration.

The European Commission, in contrast, initially blocked the merger, leading the White House to threaten trade sanctions for doing so.[171] Ultimately, after negotiations, the Commission agreed to clear the merger in exchange for conditions designed to favor Airbus's market position in the United States.[172]

Two final developments relate to ongoing protection of the U.S. market. In 2004, the United States brought suit in the WTO accusing the Europeans of illegally subsidizing Airbus.[173] The case eventually resolved in favor of the United States and led to a (WTO-licensed) tariff on Airbus.[174] Another was the planned entry of Canadian firm Bombardier into the large passenger jet market over the 2010s. That effort was

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[166] Alison Mitchell, *Clinton Warns Europeans of Trade Complaint on Boeing Deal*, N.Y. TIMES, July 18, 1997, at D2.

[167] Luz, *supra* at note 12, at 158.

[168] Press Release, Federal Trade Commission, Statement of Chairman Robert Pitofsky and Commissioners Janet D. Steiger, Roscoe B. Starek III and Christine A. Varney in the Matter of The Boeing Company/McDonnell Douglas Corporation (July 1, 1997) (on file with Federal Trade Commission).

[169] *Id*.

[170] Int'l Shoe Co. v. FTC, 280 U.S. 291, 302 (1930).

[171] Luz, *supra* at note 12, at 158.

[172] *Id.*

[173] Press Release, United States Trade Representative, WTO Appellate Body Confirms U.S. Win in Airbus Case: $18 Billion in Illegal European Subsidies to Airbus (May 11, 2011) (on file with the Office of the United States Trade Representative).

[174] Press Release, United States Trade Representative, U.S. Wins $7.5 Billion Award in Airbus Subsidies Case (Oct. 2, 2019) (on file with the Office of the United States Trade Representative).

slowed by anti-dumping proceedings instituted in 2016 [175]. In 2017, the Commerce Department instituted a 79% tariff and a 220% countervailing duty on Bombardier's existing aircraft. Facing a nearly 300% tariff the Canadian firm abandoned its effort to enter the large jet market.[176]

The clear result of these policies was to protect and support Boeing as the champion of American airplane manufacturing. In certain respects, the policy has succeeded — Boeing remains in existence and is among the world's two major sellers of aircraft.[177] However, at least compared with other technology sectors, it is harder to describe the story of Boeing as a great success. Boeing currently has a market capitalization of about $156 billion, which pales in comparison to computing firms like Apple ($3 trillion). Its stock, since the 1970s, has grown at a slower rate than the S&P 500 as a whole, despite the government aid. In recent years Boeing has shown dis-efficiencies of scale— the so-called "Curse of Bigness -- including the manufacturing defects that led to the grounding of its 737Max product.[178]

While innovation is hard to measure, it is hard to argue that U.S. airplane manufacturing has been as innovative as other technology sectors. If, as Schumpeter argued, innovation occurs through a process of industrial succession, it is notable that there has been no displacement of the dominant firm in the U.S. manufacturing of airplanes. Boeing was the dominant firm in the 1920s, and it remains the dominant firm in the 2020s.[179] In very few other technological industries is that the case.

Along similar lines, if innovation is measured along the lines popularized by Clay Christendom terms by paradigm shifts or disruptive change, since the rise of the jet airliner (which displaced the propeller) there have been few disruptive changes -- with the possible exception of the smaller airplane championed by Bombardier.[180] The major

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[175] *Decision was expected, tariff is a shocker in Boeing-Bombardier case*, LEEHAM NEWS AND ANALYSIS (Sep. 26, 2017), https://leehamnews.com/2017/09/26/decision-expected-tariff-shocker-boeing-bombardier-case/.

https://2017-2021.commerce.gov/news/press-releases/2017/09/us-department-commerce-issues-affirmative-preliminary-countervailing-1.html

[176] Allison Lampert & Rama Venkat Raman, *Airbus nails down Bombardier CSeries deal in boost to jet*, REUTERS (June 8, 2018), https://www.reuters.com/article/idUSKCN1J40QL/.

[177] Sylvia Pfeifer et al., *How Boeing's troubles are upsetting the balance of power in aviation*, FIN. TIMES (Jan. 28, 2024), https://www.ft.com/content/ddc28f31-e1af-4a81-8295-cbccf3141f49.

[178] Press Release, Fed. Aviation Admin., Statement from the FAA on Ethiopian Airlines (Mar. 13, 2019) (on file with Federal Aviation Administration).

[179] *Aircraft, Engine & Parts Manufacturing in the US*, IBISWORLD (Aug. 2025), https://my.ibisworld.com/us/en/industry/33641a/at-a-glance.

[180] CLAYTON CHRISTESEN & MICHAEL RAYNOR, THE INNOVATOR'S SOLUTION: CREATING AND SUSTAINING SUCCESSFUL GROWTH 32 (2003).

innovations have been related to the efficiency of operations and engines, which are classic examples of ”sustaining” innovations .[181]

We might put things this way. A time traveler from the 1960s would be shocked and amazed by the advances in today's computers and communications technologies, which have experienced multiple paradigm shifts and changes in technological leadership. Boarding a passenger airliner, however, would be a familiar experience. The time traveler might also be surprised to learn that supersonic passenger airplanes had been abandoned and that some travel times had increased, not decreased.[182]

To be sure, this apparent difference in innovation trajectory is surely in part a reflection of the underlying physics. The various difficulties of flying faster than the speed of sound as experienced by the Concorde jet may be an insurmountable obstacle, along with the development of other forms of jet engine. In other words, the basics of airplane technology may have matured by the 1960s, leaving little room to grow.

What is hard to know is whether this result is endogenous — i.e., the byproduct of industry structure and government policies. Technologies like electric or hydrogen-power planes have been perpetually “around the corner” for decades, as have blended-wing aircraft (airplanes that resemble a giant wing), not to mention a return to the supersonic flights available in the 1960s. None of these technologies have reached commercial deployment; whether for reasons inherent to the technology or inherent to the industry is hard to say. There is also a record of failure among U.S. aerospace startups that have attempted to enter the market either for smaller aircraft (e.g., Wright Electric) or higher-speed, supersonic planes.[183] None have achieved notable success and there have been no direct domestic challengers to Boeing itself.

In defense of U.S. policy, it is possible that failing to aid Boeing from the 80s onward would have effectively surrendered the world airline market to a subsidized Airbus. In other words, Airbus was arguably selling below cost (thanks to government support) in pursuit of a world monopoly, making American aid necessary to counter Airbus's cost advantages. That defense, however, is not a strong defense of allowing

[181] *Id.* at 34.

[182] Ben Blatt, *Airlines Are Padding Flight Times. It's Not Your Imagination.*, N.Y. TIMES (Nov. 27, 2024), https://www.nytimes.com/2024/11/27/upshot/airlines-flight-times-padding.html.

[183] *See, e.g.,* Dominic Gates, *Collapsed hybrid-electric planemaker Zunum sues former partner Boeing, alleging misuse of trade secrets*, SEATTLE TIMES, https://www.seattletimes.com/business/boeing-aerospace/collapsed-hybrid-electric-planemaker-zunum-sues-former-partner-boeing-alleging-misuse-of-trade-secrets/ (updated Nov. 24, 2020, 1:20 PM).

the Boeing - McDonnell-Douglas merger decision, nor of generally creating an environment that does not favor market entry. While

Overall, the approach of discouraging competition in the domestic U.S. aerospace industry is hard to describe as a rousing success. It has kept Boeing active in the global market — but arguably at the expense of other policy goals, like promoting auxillary industries or technological innovation which might also have contributed to American success in international markets.

3. Telecommunications

There are significant similarities and differences between the story of American telecommunications and the other industries described. All were once the domain of a dominant firm of firms with a particularly strong and insular culture. In the case of telecommunications, this came in the form of AT&T, the great American telephone monopolist.

The United States federal government, from the 1920s onward, accepted and promoted a model of regulated monopoly for the telecommunications industry, based on the adoption of the common carriage laws to the new industry of wire communications.[184] However the fact of monopoly itself attracted repeated attention from antitrust enforcers, who repeatedly took measures designed to keep AT&T in its lane -- that is, to prevent AT&T's monopoly in wire-communications from spreading to adjacent industries.[185]

The vision, while not always fully articulated, took the national telecommunications network as a form of infrastructure upon which other information-related businesses depended.[186] In the midcentury it was sometimes articulated as the policy that a common carrier should not own content.[187] Here are some of the major examples of the policy in action over the 20th century.

First, in 1913, to settle an antitrust action, AT&T agreed to stay out of the telegraph market by selling its controlling interest in Western Union (an old nemesis that AT&T had purchased).[188]

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[184] TIM WU, THE MASTER SWITCH 59 (2010).
[185] Watzinger et al., *supra* note 68, at 329.
[186] *See* TIM WU, THE MASTER SWITCH 59 (2010).
[187] Watzinger et al., *supra* note 68, at 329.
[188] MILTON MUELLER, UNIVERSAL SERVICE 130 (1997).

In 1922 AT&T began operating its own radio network, which it later named the Broadcasting Company of America (BCA)).[189] AT&T set up the nation's first network of radio stations carrying the same content to multiple cities.[190] AT&T used its telephone network to distribute the broadcast content of its flagship station WEAF to about 20 stations, reaching as far West as Kansas City and Minnesota.[191] By the mid-1920s AT&T's BCA was clearly the nation's dominant radio network.[192] It refused to transmit the content of its rival, the Radio Corporation of America (RCA), which was seeking to build its own network, and was forced for a while to use highly inferior telegraph lines.[193]

Following complaints from other firms and Congressional hearings, the FTC began an investigation of AT&T and the radio broadcasting industry in the 1920s and threatened to file a monopoly complaint.[194] The controversy was settled by the sale of AT&T's BCA to RCA, which renamed it National Broadcasting Company (NBC), in a deal brokered by then Secretary of Commerce Herbert Hoover.

AT&T also expanded into the nascent film industry in the 1920s.[195] In the 1930s, the FTC filed a series of lawsuits against AT&T'[196]. The complaint was based on allegations that AT&T was using its patents over film sound technology to tie[197].[198] After a lengthy process, AT&T decided to exit the film industry as well.[199]

In 1956, the Justice Department sued AT&T for monopolization, in a suit that was focused on the handset[200]. Justice did not end up seeking AT&T's exit from the handset industry. Instead, with greater long-term consequence, the government forced AT&T to agree to broadly stay out of computing and semi-conductors (more technically to stay out of any industry other than communications.) [201] The 1956 decree, as others have

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[189] WILLIAM PECK BANNING, COMMERCIAL BROADCASTING PIONEER; THE WEAF EXPERIMENT 288 (1946).

[190] U.S. FED. COMMC'NS. COMM'N., REPORT ON CHAIN BROADCASTING 6 (1941).

[191] *Id.*

[192] *See id.* at 6-7.

[193] *Id.* at 7.

[194] TIM WU, THE MASTER SWITCH 80 (2010).

[195] JOHN BROOKS, TELEPHONE 181 (1975)

U.S. FED. COMMC'NS. COMM'N., PROPOSED REPORT: TELEPHONE INVESTIGATION 473-80 (1938).

[197] *Id.*

[199] BROOKS, *supra* note 225, at 183.

[200] Watzinger et al., *supra* note 68, at 329.

[201] *Id.*

documented, left much room for computing industry (IBM) and the nascent semi-conductor industry(Shockley, Fairchild and Intel) to grow and expand.[202]

Finally, in the 1970s, pursuant to the FCC's *Computer Inquiries,* AT&T was kept at a distance from nascent online services and data processing industries.[203] Those rules later morphed into the FCC's Net Neutrality principles, which kept AT&T at a distance from the various firms, including telephony firms like Skype or the streaming pioneer Netflix, that were launching over the 1990s-10ss on top of the newly popular Internet.

These interventions were extensive and went far beyond those found in the computing, automotive, or aerospace industries. They represented a full-fledged industrial policy that continued to allow AT&T its monopoly, and somewhat elevated profits (albeit through regulated prices) but kept it out of other industries.

In the 1970s the federal government became even more aggressive. The well-known big antitrust case against AT&T, commenced in 1974, stemmed from an effort to enforce the same policy.[204] The FCC had come to believe that the telephone equipment markets (i.e., telephones and other devices, like modems and answering machines), data-processing and long-distance markets should also be understood as adjacent industries, as opposed to core to telecommunications.[205] AT&T disagreed, and continued to do what it could to maintain control over those industries, using methods including sabotages, refusals to interconnect and others.[206]

The final result of the 1974 AT&T antitrust suit was the breakup of AT&T, (technically agreement to divest of the Bell operating companies by the larger AT&T holding company).[207] While intended to foster competition generally, and important for long-distance firms like MCI, over the longer term, it is clear that the most important consequences of the AT&T breakup were for adjacent industries — most notably, the online services firms like Compuserve, Prodigy and AOL, which eventually became what we now call the Internet industries.[208]

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[202] U.S. OFF. TECH. ASSESSMENT, OTA-CIT-268, INFORMATION TECHNOLOGY AND R&D: CRITICAL TRENDS AND ISSUES 115 (1985).

[203] See Robert Cannon, *The Legacy of the Federal Communications Commission's Computer Inquiries*, 55 FED. COMMC'NS. L. J. 167, 178 (2003).

[204] *See* TIM WU, THE CURSE OF BIGNESS 94-95 (2018).

[205] *Id.* at 94.

[206] TIM WU, THE MASTER SWITCH 191-92 (2010).

[207] TIM WU, THE CURSE OF BIGNESS 96 (2018).

[208] *Id.* at 97.

Viewed in its entirety , the industrial policy employed in telecommunications had some role in the promotion of a large number of US firms and industries. They include the broadcasting industry (NBC in particular), the computing industry (IBM in particular), semiconductors (Intel), networking equipment (Hayes and US Robotics), the online services industry (AOL) and eventually the Internet industry itself (Google, Amazon, etc). Each of these were at some point businesses that were adjacent to, dependent on or formerly owned by AT&T. That these were significant firms cannot be disputed.

What if, in an alternative history, AT&T had been permitted to expand freely into or control the various adjacent businesses? It seems possible, but highly doubtful, that if AT&T had dominated not just telephony but also broadcasting, film, computing and online services that it would have been just as innovative and driven as rapid growth as the newer firms in those industries. Instead, there is better reason to think that the result would have been a slower pace of innovation and growth. A few data points support that conclusion. First, the services that did remain under AT&T's control, like end-user equipment (i.e., handsets and other attachments to the network), innovated slowly and pursuant to strong limits. It was only in the 1970s, after federal intervention, that the markets for answering machines, modems, and similar technologies exploded. AT&T pointedly refused to sell or allow connection of answering machines to its network, despite having a working prototype by the 1930s.[209] Second, we know that AT&T, which subscribed strongly to a centralized "one network" model of communications, was ideologically resistant to the ideas that were central to the Internet suite of protocols and, left to its devices, would have been unlikely to deploy the technologies that led to the modern internet technologies.[210] We also, finally, have a natural experiment in those nations which allowed their telecom monopolists to expand more freely — like Japan and Germany. There is little question that those nations saw much more limited development of industries adjacent to the telecommunications monopoly.[211]

American Computing

U.S. computing, like telecommunications, was the recipient of significant government support (mainly through contracts and the subsidization of research) and also intense antitrust pressure. During the critical decade of the 1970s, the key source

[209] Mark Clark, *Suppressing Innovation: Bell Laboratories and Magnetic Recording*, 34 TECH. & CULTURE 516, 529 (1993).

[210] *See* TIM WU, THE MASTER SWITCH 51 (2010).

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of pressure was the *United States v. IBM* monopolization case, but there were earlier interventions as well.[212]

In 193[3], in the first case relevant to computing, the Justice Department brought the first *United v. IBM* case to prevent IBM from forcing its customers to only use IBM's data cards with IBM accounting machines.[213] The government itself had manufactured its own, cheaper, cards;[214] IBM told customers that using foreign cards would violate IBM's patent and leasing terms.[215] The Supreme Court found that IBM must allow their customers to use any tabulating cards that met non-discriminatory technical specifications that IBM was required to promulgate (what we now call an interoperability rule.)[216]

In 1952, in an echo of the 1936 case, Justice alleged that IBM had tied its punch cards to sale of its accounting machines[217] and also anticompetitively refused to sell (as opposed to lease) its equipment.[218] IBM settled that case by agreeing to license its patents to competitors on reasonable terms, which accelerated the development of many rival computing companies – General Electric (GE), Control Data Corporation (CDC), and Unisys. IBM also agreed to sell its equipment to customers.[219]

These cases proved a prelude to the main event: the 1969 Justice Department monopolization case, which yielded a 15-year investigation and trial that strongly influenced the conditions in the computing industry in the 1970s and onward.[220] The IBM case is well known in antitrust circles and many aspects of the investigation and trial have been criticized. IBM was forced to produce over 30 million pages of documents; the trial itself dragged on for six years.[221] Despite these shortcomings, the Justice Department's actions can be credited with causing or influencing at least three developments of long term structural significance for the industry.

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[212] JAMES W. CORTADA, IBM: THE RISE AND FALL AND REINVENTION OF A GLOBAL ICON 325 (2019).

[213] United States v Int'l Bus. Machs. Corp., 13 F. Supp. 11, 15 (S.D.N.Y. 1935), *aff'd*, 298 U.S. 131 (1936).

[214] *Id.* at 13.

[215] *Id.* at 15.

[216] Int'l Bus. Machs. Corp. v. United States, 298 U.S. 131, 140 (1936).

[217] EMERSON W. PUGH, BUILDING IBM 252-253 (1995)

[218] EMERSON W. PUGH, BUILDING IBM 252-253 (1995)

[219] *Id.* at 254-55.

[220] CORTADA, *supra* note 242, at 325.

[221] Liliane Kerjan, *Antitrust Laws: the IBM and AT&T Cases*, 35 REVUE FRANÇAISE D'ÉTUDES AMÉRICAINES 89, 96 (1988). *Id.* at 95.

First, in 1969, IBM unbundled software from hardware.[222] It did so during the early phase of the antitrust investigation hoping to avoiding the filing of a complaint by the Justice Department. IBM's general counsel identified "bundling as a glaring violation of antitrust law" and suggested that, if forced to defend the tie, IBM "would lose," as confirmed in Thomas Watson Jr.'s biography.[223]

The unbundling of software changed the structure of the computing industry. While it was slow to start, after a decade software, freed from hardware, had become among the fastest growing industries in the United States, and had a significant impact of the economies of California, Texas and Washington, among other places. This growth of adjacent or auxiliary markets is one of the main hallmarks of the industries subject to antitrust attention. The birth of software also began the age of "Divided Technological Leadership," the phrase coined by Timothy Bresnahan.[224] By that he meant an era in which no single monopoly controlled the computing industry, but rather a variety or interoperating firms at different levels exercised significant power.

Second, the IBM lawsuit influenced the personal computer (micro-computer) market that began growing in the late 1970s. The personal computer market, once established as an important market by Apple and others, became a natural target for IBM entry. Yet the mode of IBM entry has hallmarks of antitrust-driven caution. For one thing, IBM declined to try and buy Apple or another firm — fearing antitrust scrutiny. It instead entered the market through a joint-venture approach closed-system like the mainframe, but was instead a revolutionarily modular computer. It had a [225]ard drive manufactured by Seagate, printer from Epson, a processor from Intel, and most importantly an operating system provided by a small startup named "Micro-Soft." Importantly, the IBM-PC was not only modular, but made without the requirement for its supplier companies to maintain exclusive sales relationships with IBM. That non-exclusivity was a crucial factor facilitating competition in the market for IBM-compatible PCs (like Compaq, or Dell).[226] While the IBM-PC wasn't developed until the 1980s, anti-trust phobia likely played a key role in preventing IBM from monopolizing the personal computer market via exclusive contracts. The other reading of history is that IBM was too stupid to recognize the value that could be extracted from the best-selling computer of all time.

Third, IBM in the 1970s and 1980 declined to acquire obvious targets who would later grow into rivals or firms that took markets away from it. For example IBM

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[222] WATSON JR. & PETRE, *supra* note 86, at 380.
[223] *Id.* at 381.
[224] Bresnahan & Greenstein, *supra* note 88, at 3.
[225] CORTADA, *supra* note 242, at 388.
[226] *Id.*

considered the acquisition of Microsoft and hard drive manufacturer Seagate when both firms were still small businesses.[227] However, the acquisitions were discouraged by the company's attorneys, who feared doing so would lead to a return of antitrust attention..

Taken together, these decisions did much to open up the computing market and allow for companies like Microsoft, Apple, Dell, Seagate, Lotus, Oracle and many others to develop in a market where IBM had been dominant. Decades later it is clear that antitrust intervention most certainly did not crush innovation in U.S. computing and very well may have been the key policy decision that enabled the startup revolution in computing. It is hard to deny that the pressure on IBM had some role in transforming computing into an ecosystem, as opposed to an industry dominated by one firm.

It can be argued that low barriers to entry were inherent to high-technology markets of the mid-twentieth century, and that an ecosystem of super-star firms would have emerged regardless of or even despite antitrust policy. Yet is also true that many comparative nations with sophisticated investment and property rights regimes failed to develop their own decentralized and innovative computing ecosystems.

Considered the contrasting examples of Japan, Britain, and the United States. Each nation subsidized the development of “national champion” computing giants – IBM, Fujitsu, NEC, and ICL.[228] Unlike the United States though, Britain and Japan chose an antitrust strategy that generally protected their national champion from domestic competition so as to increase their competitiveness with international rivals. This policy failed to foster a competitive computing industry, and at best created plausible international rivals to IBM or its successors.[229]. But the strategy failed badly in allowing room for adjacent industries -- notably software -- to grow.

The United States was the only country to actively force competition in computing through significant and ongoing antitrust interventions. It was also the only country that was home to a dynamic, boundary-pushing computing industry. There is no way to determine the degree to which the antitrust regime was necessary for the development

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[228] Kazutoshi Koshiro, *Japan's Industrial Policy for New Technologies*, 142 J. INSTITUTIONAL & THEORETICAL ECON. 163, 171 (1986); Martin Campbell-Kelly, *ICL and the American Challenge*, *in* TECHNOLOGICAL COMPETITIVENESS 105, 114 (William Aspray ed., 1993).; S. Linn Willams, *Japanese Industrial Policy: What Is It, and Has It Worked*, 19 CAN.-U.S. L.J. 79, 87 (1993).

[229] Campbell-Kelly, *supra* note 265, at 116-17.

of U.S. computing, but it is clear that the costs of under-enforcing the antitrust laws in computing can be great indeed.

Part IV: What the case studies suggest

The Relative Roles of Technological Destiny and Intervention

The history of any industry is complex and the outcomes are always the byproduct of multiple factors. Assessing causation is challenging and perhaps impossible. Nonetheless it is worth discussing the competing explanations for the differential outcomes of the four technology industries: (1) antitrust intervention, (2) technological destiny, and (3) management decisions.

The third explanation is most easily dismissed. None of the firms embraced their own loss of markets with any real enthusiasm – even if doing so might, in retrospect, been better for the broader ecosystem and the economy. Firms are not charities, and the companies in question fought decentralization with all of their power and resources but failed to prevent it (not withstanding a few expressions of enthusiasm by AT&T officials at the very end).[230] That stands to reason, given that CEOs are tasked with the leadership of a firm, not a sector, and it would take an unusual leader indeed to accept their firm's own sacrifice for the greater good.

The real debate lies between antitrust pressure and technological destiny. And the predictable answer is "both." As a technological matter, both telecommunications and computing proved amenable to the modular platform model which has come to dominate contemporary tech industries. That model, which envisions a platform that then accepts and supports many modular applications and runs across many types of physical infrastructure, is at the center of most of the high-growth industries of the last 60 years.

That said, the industry's acceptance of platformization was hardly preordained. In both industries, it was pushed by the government and its antitrust lawsuits (as detailed above). It is notable jurisdictions where government avoided intervention, like Japan, the results are different. Japan had centralized computing and telecommunications industries, like the U.S., but did not intervene forcibly.

[230] TIM WU, THE MASTER SWITCH 159 (2010); WATSON JR. & PETRE, *supra* note 86 at 377-78.

Consequently, those industries remained centralized and did not experience either the growth of innovation seen in the United States in the 80s – 00s.[231]

Room for Coexistence of Aid and Antitrust. Government is often described as "in favor of" or "against" one industry or another. And in this formulation, "against" is taken to mean that the industry is subject to antitrust attention. But the case studies reveal that this is a false dichotomy. The federal government can simultaneously seek to improve internal competition while also aiding the industry using other channels, like the subsidization of basic research.

We see this pattern in this four tech industries of the 20th century. Telecommunications provides the most striking and probably the most successful example. Over the 1960s - 1980s, the federal government was engaged in intense antitrust and FCC actions against the Bell company. But at the same time, particularly through its subsidization of Internet research, the federal government was providing aid to the communications industry as a whole.[232] Ultimately it was other firms, and not AT&T, that deployed new Internet technologies. Similarly, in computing, the government both funded computer research and served as a major buyer of computers from IBM and other firms, at the same time that the antitrust division sought the breakup of IBM.[233]

The apparent inconsistency of government both funding an industry and intervening to force it to compete is no inconsistency at all. It just calls for a less two-dimensional view of industrial policy that suggests a binary choice between aiding an industry, or not doing so. Like the proverbial athlete, the industry can be both fed and forced to spar with significant opponents, in the interests of greater strength.

The Antitrust version of the Loser's Paradox. Just as there may be some tendency to come to the aid of industries in distress, there is a corresponding tendency to grant a *de facto* antitrust immunity to industries that are either in decline or facing significant foreign competitor. This is Daniel Sokol's concern that industrial policy might weaken antitrust enforcement.[234] A striking example comes from the automotive industry, which went from a target of antitrust attention in the 1960s, and to some

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[231] Shohei Kurita, *The PC Market in Japan: Where's IBM?*, 14 ELEC. BUS. 56, 56 (1988).

It is interesting to ask whether the automotive industry might have platformized — become centered on a basic platform to which dependent businesses reached consumers. *See* TIM WU, THE AGE OF EXTRACTION, Ch. 3 (2025). The equivalent might have been the growth of an independent engine or transmission business.

[232] Robert E. Kahn, *The Role of the Government in the Evolution of the Internet*, *in* REVOLUTION IN THE U.S. INFORMATION INFRASTRUCTURE 13, 15 (1995).

[233] David M. Hart, *IBM in American Politics, 1970-1999*, 28 BUS. & ECON. HIST. 49, 50 (1999).

[234] *See generally* D. Daniel Sokol, *Limiting Anticompetitive Government Interventions That Benefit Special Interests*, 17 GEO. MASON L. REV. 119 (2009).

degree the 1970s, to an industry decidedly outside of antitrust scrutiny. Similarly, once Boeing came under serious challenge from Airbus and later, antitrust policy clearly shifted as evidenced by the soft merger review in 1997.

The tendency to grant government aid to industries in distress has some justification. But the antitrust version of the leniency is harder to justify, for any exclusionary effects may only slow the recovery of the industry. In the United States, for example, most of the technology to create effective electric vehicles was in existence by the 1990s.[235]

Arbitrary Nature of Antitrust Standards from an Industrial Policy Perspective. Antitrust, from an industrial policy perspective, can be capricious in unnecessary ways. An example comes from the strict "monopoly power" requirement in Section 2 case law. The relevant jurisprudence has generally limited monopolization cases to defendants with a 70% or greater market share.[236] That cut-off point may make some sense for antitrust purposes, but may seem arbitrary when the concern is that an uncompetitive industry that damages national competitiveness.

Returning to the 1960s, the 70% mark led to IBM's being subject to to a long-running lawsuit with numerous consequences, while GM, with its 55% market share, was left alone.[237] In terms of size (not market share) GM was the larger and more significant firm.[238] It is true that Ford was a more significant competitor than any IBM faced, but also true that Ford avoided undue competition with GM during that period even with respect to setting prices.[239] The point is that the relatively small distinction in dominance between the two firms yielded very different antitrust treatment, and consequently very different industrial policies.

Industrial policy — at least in its training aspect, cares less about the existence of monopoly and more about the absence of effective competition. That might sound like a semantic difference but it is not. For a policy-maker who wants to strengthen an industry it is the absence of competition that is a problem, not the existence or non-existence of monopoly.

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[235] As evidenced, by example, by the GM EV1, an early electric car that was discountinued. Jack Mitchell, *This little electric car made history. 25 years ago, GM stopped making it*, NAT'L PUB. RADIO (Dec. 6, 2024), https://www.npr.org/2024/12/06/nx-s1-5116270/ev1-general-motors-electric-vehicle.

[236] *See, e.g.*, Exxon Corp. v. Berwick Bay Real Estates Partners, 748 F.2d 937, 940 (5th Cir. 1984) (per curiam) ("...monopolization is rarely found when the defendant's share of the relevant market is below 70%.")

[237] *State of Business: The Profits Paradox*, TIME (May 4, 1962), https://time.com/archive/6623528/state-of-business-the-profits-paradox/.

[238] GENERAL MOTORS CORPORATION, GM ANNUAL REPORT 1961 4 (1961); *IBM Sets Mark for Sales, Profit*, N.Y. TIMES, July 13, 1961, at 41.

[239] *Automobile Hearings*, *supra* note 151, at 2408.

Innovation in Adjacent Markets. One of the greatest differences in outcome as between the industries subject to antitrust those left alone is the growth and innovation in adjacent industries in the former. The computing and telecommunications industries saw the growth of software, peripherals, online services, and the internet more generally. In automotive and aerospace while there has been significant outsourcing, the same pattern of explosive growth in adjacent industries is hard to see, unless one defines the electric car as a form of adjacent industry.

Why this difference in outcome? One possibility is that the automotive and aerospace industries were technologically less likely be able to become platforms or springboards for other industries of significance. The other possibility is that the restriction of exclusionary effects created incentives to invest, and for talented individuals to quit and start firms in such industries. Innovation patterns in monopoly-adjacent industries is a ripe subject for further research and empirical work.

Industry Succession. Joseph Schumpeter famously described the process of innovation as akin to a biological process: an "industrial mutation … that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one."[240] This process, which he called creative destruction would seem likely to yield new firms in technologically-dependent industries.

In the industries we have described it is a striking fact that those subject to antitrust attention have undergone multiple forms of industrial succession. The leading computer firms of the 2020s are unrecognizable to someone from the 1960s. In contrast the dominant American automotive and aerospace company remain the same.

Conclusion

Within the White House there are usually separate groups working on "competition" and "competitiveness." The relationship between the two groups might seem fraught. But the answer suggested by this paper is that competition creates competitiveness. The underlying idea is relatively simple: forcing an industry to compete internally can make it more competitive in the world.

[240] JOSEPH SCHUMPETER, CAPITALISM, SOCIALISM, AND DEMOCRACY 82-83 (1942).