

# The Politics of the American Knowledge Economy

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## **Abstract**

The American knowledge economy (AKE) is not a foreordained transition in the organization of economic production, nor is it a form of political economy shaped predominately by the political demands of highly educated workers. It is a politically generated consensus for producing economic prosperity and economic advantage over other nations in which intellectual property (IP), and the businesses that produce it, play a leading role. The history of AKE development reveals as much. In the AKE's formative period, from 1980 to 1994, IP producers and a faction of neoliberal Democrats (the Atari Democrats), not decisive middle-class voters, played a pivotal role in reconfiguring institutions of American political economy to hasten the AKE transition. Their vision of AKE development inherently complicated the Democratic Party's attitude towards rising market power and continues to shape contemporary disputes within the Party over antitrust enforcement and the validity of the AKE project itself.

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# 1 Introduction

Though many scholars now accept that, at some point in the last forty years, the United States transitioned from a Fordist economy rooted in mass production to a post-Fordist “knowledge economy,” there is surprisingly little consensus about how we should define or characterize the knowledge economy we now inhabit. One view, popular among economists since the emergence of new growth theory in the 1990s, suggests that the knowledge economy is rooted in rapid technological change and the prospect that firms and nations can generate competitive advantages by focusing on the generation of ideas rather than the manufacturing of products.<sup>1</sup> In this perspective, though many forms of state action can promote technological change, the most important policies are those pertaining to intellectual property (IP), as these policies surmount a free-rider problem endemic to the innovation environment: firms and nations that invest in developing new technologies often struggle to appropriate the economic benefits of those investments in the absence of some form of legal protection because subsequent actors can simply copy the first mover.<sup>2</sup> Because certain forms of IP, especially patents and trade secrets, resolve this problem and enhance the incentive to invest in technological development, “Economists have long seen the patent system as a crucial lever through which policymakers affect the speed and nature of innovation in the economy.”<sup>3</sup> From this perspective, one would accordingly expect the knowledge economy transition to intensify the degree to which business managers and government actors come to view intangible IP, rather than labor and machines, as the “key economic asset that drives long-run economic performance.”<sup>4</sup>

Despite its prevalence in economic thinking, the view that the knowledge economy is organized

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1. Elhanan Helpman, *The Mystery of Economic Growth* (The Belknap Press of Harvard University Press: Cambridge and London, 2004), 43–46.

2. Suzanne Scotchmer, *Innovation and Incentives* (The MIT Press: Cambridge and London, 2004), 34–39.

3. Josh Lerner, “The Empirical Impact of Intellectual Property Rights on Innovation: Puzzles and Clues,” *American Economic Review* 99, no. 2 (2009): 343–48.

4. Adam B. Jaffe and Manuel Trajtenberg, *Patents, Citations, and Innovations: A Window on the Knowledge Economy* (The MIT Press: Cambridge and London, 2002), 1; Jonathan Haskel and Stian Westlake, *Capitalism Without Capital: The Rise of the Intangible Economy* (Princeton University Press: Princeton and Oxford, 2018).

around the production and utilization of IP has gained only marginal acceptance among political scholars.<sup>5</sup> Rather, the knowledge economy is more often conceptualized as a byproduct of technologically-based shifts in the occupational structure and the increasing economic and political power of educated workers, an idea that dates back at least to Daniel Bell's theory of the post-industrial society.<sup>6</sup> Accordingly, some follow Bell in relating the knowledge economy to the "service transition," the long gradual shift in the share of national income flowing from the provision of services rather than the production of goods, and to post-industrialism more broadly.<sup>7</sup> Others contend that IP plays only a marginal role in the knowledge economy because technology is more firmly rooted in the skills of educated workers.<sup>8</sup> Though also rooted in economic thinking, these perspectives borrow less from new growth theory and more from the theory of skill-biased technological change, in which technological advances in computing asymmetrically reward those middle-class, better educated workers who can use computers to become more productive.<sup>9</sup> To the extent such theories identify an economic asset at the root of the knowledge economy, they generally point to human capital or "skills" and downplay the role of IP.<sup>10</sup>

If there is disagreement about whether the institutions of the American knowledge economy are geared towards IP production or human capital formation, there is also disagreement about the political forces shaping American knowledge economy development. Two prominent theories, those associated with Iversen and Soskice (2019) and Hacker et al. (2022), agree that knowledge

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5. The strongest voices against this trend have been Susan Sell and Mark Schwartz. Susan K. Sell, *Private Power, Public Law: The Globalization of Intellectual Property Rights* (Cambridge University Press: New York, 2003); Herman Mark Schwartz, "Corporate Profit Strategies and U.S. Economic Stagnation," *American Affairs* IV, no. 3 (2020).

6. Daniel Bell, *The Coming of Post-Industrial Society: A Venture in Social Forecasting* (Harper Colophon Books: New York, 1974).

7. Ben Ansell and Jane Gingrich, "Concentration and Commodification: The Political Economy of Postindustrialism in America and Beyond," chap. 13 in *The American Political Economy: Politics, Markets, and Power*, ed. Jacob S. Hacker et al. (Cambridge University Press: New York, 2022).

8. Torben Iversen and David Soskice, *Democracy and Prosperity: Reinventing Capitalism Through a Turbulent Century* (Princeton University Press: Princeton and Oxford, 2019).

9. Iversen and Soskice, *Democracy and Prosperity: Reinventing Capitalism Through a Turbulent Century*, 12–13, 39–41; Claudia Goldin and Lawrence F. Katz, *The Race Between Education and Technology* (The Belknap Press of Harvard University Press: Cambridge / London, 2008).

10. Iversen and Soskice, *Democracy and Prosperity: Reinventing Capitalism Through a Turbulent Century*, 2–3, 12–13, 31.

economies are politically constructed and that the state plays a major role in shaping knowledge economy development.<sup>11</sup> But the theories have starkly different views on which actors have political power in relation to the state and the ways in which those actors have shaped the institutions of the American knowledge economy. Iversen and Soskice (2019) contend that knowledge economy policies are produced at the behest of decisive middle-class voters who strongly demand policies that promote human capital formation. They write, for example, that because the “advanced sectors” of the knowledge economy are “skill intensive,” education is “by far the most important path” to inclusion in the knowledge economy, and so decisive aspirational voters who are invested in the knowledge economy or want their children to participate in it support policies that favor these sectors, “notably through investment in education and research and development, coupled with strong competition rules.”<sup>12</sup> The authors also contend that, when combined with the geographic immobility of knowledge economy workers on which the advanced sectors depend, this intense electoral connection means that capital does not have structural power and that business interests are therefore politically weak.<sup>13</sup>

In contrast, a group of scholars working to establish a new field of American political economy suggests that American political institutions are unique in ways that give a strong advantage to organized business interests.<sup>14</sup> For this group of scholars, American political institutions are exceptional in the extent to which they divide political power among multiple venues, both horizontally between branches of government and vertically between the national and sub-national levels of government. In this perspective, separation of powers, bicameralism, federalism, the representation of geographic entities in the national legislature, super-majoritarian requirements

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11. Iversen and Soskice, *Democracy and Prosperity: Reinventing Capitalism Through a Turbulent Century*; Jacob S. Hacker et al., “Introduction: The American Political Economy: A Framework and Agenda for Research,” chap. 1 in *The American Political Economy: Politics, Markets, and Power*, ed. Jacob S. Hacker et al. (Cambridge University Press: New York, 2022).

12. Iversen and Soskice, *Democracy and Prosperity: Reinventing Capitalism Through a Turbulent Century*, 20–21.

13. *Ibid.*, 11–12, 19, 39.

14. Hacker et al., “Introduction: The American Political Economy: A Framework and Agenda for Research.”

like the filibuster, an entrenched two-party system, extreme decentralization in the bureaucracy, and a uniquely strong and independent judiciary—these and other characteristics of American political institutions converge to make policy change extremely difficult in the United States, especially when it comes to national policies that shape the macroeconomic order. These factors also give a decisive advantage to organized interests over ordinary voters by opening multiple venues to contest proposed policy changes and defend the status quo, especially for those organized *business* interests that have the resources and patience to navigate the nation’s complex institutional landscape and repeatedly defend their interests over long time frames. Accordingly, “despite frequent elections and the valorization of representative government, voter influence in American politics is highly mediated and conditional.”<sup>15</sup> These scholars also contend that these forces explain why the United States has lost its dominant position in providing key public goods that promote knowledge economy development, like higher education and the public financing of research and development.<sup>16</sup>

The key claim advanced in this article is that, when we focus on the policy outputs and institutional changes that facilitated the knowledge economy transition, the theory advanced by the American political economy group better fits the historical data. During the crucial years of knowledge economy formation, from 1980-1994, many of the policies demanded by aspirational middle-class voters, from increased spending on research and development or higher education to more robust forms of industrial policy, failed to materialize while the policies demanded by technology firms and their business managers, chiefly patent reform and decreased antitrust scrutiny, enjoyed easy bi-partisan support. Iversen and Soskice’s theory of advanced capitalist democracies does describe some of what happened within the Democratic Party in the United States, as some within the

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15. Hacker et al., “Introduction: The American Political Economy: A Framework and Agenda for Research,” 3.

16. Hacker et al., “Introduction: The American Political Economy: A Framework and Agenda for Research,” 41-42; Lucy Barnes, “Public Investment in the Knowledge Economy,” chap. 12 in *The American Political Economy: Politics, Markets, and Power*, ed. Jacob S. Hacker et al. (Cambridge University Press: New York, 2022).

Party tried to advance policies that had broad appeal to highly educated, increasingly suburban, middle-class constituents. But from 1980 to 1994, the Democratic Party enjoyed unified control over government in only two years and faced significant obstacles to policymaking even then. Accordingly, in a setting of divided government and an increasing partisan divide over the proper role of the state in managing the macroeconomic order, Democratic aspirations were effectively narrowed to a subset of market-oriented reforms that would strengthen and expand the global reach of IP rights and reduce antitrust scrutiny of high-tech businesses. It is in this sense that the American knowledge economy (AKE) is organized around the production and private sector utilization of IP and not human capital formation.

The argument can be summarized pictorially with the four graphs displayed in Figure 1, each of which shows the time series evolution of an important knowledge economy policy indicator for the sixty year period between 1960 and 2020. Panel A shows that per capita tax appropriations for higher education (spending per adult aged 18-24) grew dramatically during the prior Fordist period, but grew much more slowly between 1980 and 1994 and ultimately plateaued around the year 2000. Similarly, Panel B shows that the average cost of tuition and fees at four-year colleges relative to the median family income declined during the prior Fordist period but then increased dramatically after 1980. Together, these two graphs suggest that, to the extent there was a period in which decisive voters succeeded in demanding increased public financing to make higher education more affordable for the median family, it was the prior Fordist period. When Ronald Reagan took office in 1981, a majority of adults in nationally representative surveys believed that the nation was spending too little on improving the nation's education system (a margin that grew to 67 percent during his tenure) and much larger majorities of registered voters (78 percent) opposed seeking a balanced budget if it meant spending less on education.<sup>17</sup> And yet these demands failed

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17. The Roper Organization, Roper Reports 1981-01: Politics/Media/Environment/Business, Question 9, USROPER.81-1.R03G (Cornell University, Ithaca, NY: Roper Center for Public Opinion Research, 1980); National Opinion Re-

to materialize into policy changes that would make a college education more affordable for the median family. Similarly, Panel C shows that federal outlays as a share of the total budget (the trends are similar when shown as a share of GDP) declined substantially after the mid-1960s and that trend has continued to the present day. In these and other ways, as the knowledge economy transition accelerated, the U.S. government failed to meaningfully respond to the demands of aspirational middle-class voters in the way predicted by Iversen and Soskice.<sup>18</sup> But elected officials were capable of generating bi-partisan consensus in favor of patent reform, as described herein, and the outpouring of new legislation and policy they passed dramatically reversed the long slow decline in domestic per capita patent applications that characterized the prior Fordist period, as shown in Panel D.

In the argument that follows, I adhere to a long tradition in comparative political economy by assuming that modes of economic production (or growth regimes) are politically negotiated, and I turn to the historical record to understand the political moment in which the idea of a knowledge economy took hold in American politics and to analyze the ways in which that political movement altered central institutions of American political economy.<sup>19</sup> The analysis reveals, first and foremost, that the AKE is not about the production of knowledge per se—which was equally important during the Fordist era and the Cold War—nor is it a growth regime geared towards increasing economic opportunities for the electorate through education and training. It is instead a growth regime organized around the production and private sector utilization of IP. Political

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search Center General Social Survey 1989, with funding from the National Science Foundation, Question 2161, USNORC.GSS89.R069G, (Cornell University, Ithaca, NY: Roper Center for Public Opinion Research, 1989); Time Magazine, Yankelovich/Time Magazine Poll: Time Soundings—Economy/Reagan/Foreign Affairs, Question 48, USYANK.818609.Q09EG, Yankelovich, Skelly & White, (Cornell University, Ithaca, NY: Roper Center for Public Opinion Research, 1981).

18. Iversen and Soskice, *Democracy and Prosperity: Reinventing Capitalism Through a Turbulent Century*.

19. Peter A. Hall and David Soskice, “An Introduction to Varieties of Capitalism,” in *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, ed. Peter A. Hall and David Soskice (Oxford University Press: Oxford, 2001), 1–68; Peter A. Hall, “From Keynesianism to the Knowledge Economy: The Rise and Fall of Growth Regimes,” *Business Economics*, no. 54 (2019): 122–26.

representatives remained committed to producing technological knowledge to maintain military supremacy and produce economic prosperity in both periods. Where the AKE differed was in the political consensus about who would own and control the dissemination of that knowledge. Accordingly, I define the AKE as a politically negotiated plan for generating economic prosperity wherein the production of *commodified* technological knowledge, or IP, is the primary means for achieving economic development.

Beyond identifying the relationship between the AKE and IP, an analysis of AKE development produces other important insights for political scholars. I will emphasize three such contentions in the argument that follows. The first is that, while the AKE ultimately generated strong bi-partisan support, the Democratic Party was always its most forceful advocate. In the crucible of the 1970s and early 1980s, a neoliberal faction within the Democratic Party—the “Atari Democrats”—successfully pushed the Party to embrace the knowledge economy as an alternative to Keynesianism that was distinct from the Republican alternative, which was oriented around market fundamentalism. Their initial visions were relatively ambitious as they saw technology not only as a means to provide hope for communities experiencing deindustrialization but also as a means to address social problems like environmental degradation and resource depletion. But those more capacious visions of the AKE foundered in a divided government led by a President who believed the state had a limited role to play in a capitalist society. The consensus that emerged therefore centered on a much more limited set of market-oriented reforms to strengthen and expand IP rights. The “lost alternative” of this formative period, from 1980-1994, is one where the state could have played a much stronger role in facilitating and harnessing technological development to produce desirable social outcomes.<sup>20</sup> Some of the most politicized moments of AKE development involve Democratic attempts to recapture this lost alternative, as President Clinton discovered with the Advanced

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20. Karen Orren and Stephen Skowronek, *The Search for American Political Development* (Cambridge University Press: New York, 2004), 66.

Technology Project and President Obama discovered with Solyndra.<sup>21</sup>

The second contention is that, in addition to Democratic Party leaders, IP producers and the subset of professionals that service IP producers, like IP attorneys and venture capitalists, are the key political actors in the story of AKE development, not decisive middle-class voters. Though knowledge economy rhetoric naturally offers much to those who value education as a source of status and a vehicle for economic mobility, and though this made the knowledge economy more attractive to Democratic rather than Republican Party officials in the 1980s, political discourse about the AKE in its formative years was fundamentally about identifying the decisive businesses, not the decisive voters, that would restore the nation's military and economic supremacy. Accordingly, organizations representing IP producers, not middle-class voters, played a pivotal role in altering central institutions of American political economy—from the courts, to universities, to institutions for negotiating multilateral trade agreements—to hasten AKE development.

The lobbying successes that IP producers enjoyed from 1980 to 1994 are somewhat striking and counter-intuitive because IP producers are an extremely heterogeneous bunch. Private sector IP producers hail from many different industries and sectors of the economy and include brand name (Pfizer and Merck) rather than generic drug companies, the designers of genetically modified plants and seeds (Monsanto and DuPont) rather than farmers, and a host of well-known internet search (Google), software (Microsoft), and computer technology (IBM and Apple) companies. But universities and the consortia in which they partner with private firms are also IP producers.

Despite their diversity, IP producers are united by a common interest in maximizing the rents they

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21. Marian Negoita, "To Hide or Not to Hide? The Advanced Technology Program and Future of U.S. Civilian Technology Policy," in *State of Innovation: The U.S. Government's Role in Technology Development*, ed. Fred Block and Matthew R. Keller (Paradigm Publishers: Boulder and London, 2011); Joe Stephens and Carol D. Leonnig, "Solyndra: Politics Infused Obama Energy Programs," *The Washington Post*, 2011, accessed April 9, 2021, [https://www.washingtonpost.com/solyndra-politics-infused-obama-energy-programs/2011/12/14/gIQA4HIIHP\\_story.html](https://www.washingtonpost.com/solyndra-politics-infused-obama-energy-programs/2011/12/14/gIQA4HIIHP_story.html); Ashe Schow, "President Obama's Taxpayer-Backed Green Energy Failures," *The Daily Signal*, 2012, accessed August 6, 2021, <https://www.dailysignal.com/2012/10/18/president-obamas-taxpayer-backed-green-energy-failures/>.

can generate from their most important capital asset, their IP.<sup>22</sup> Bound by this common interest, and backed by political leaders who believed the nation's economic and military supremacy depended on that same outcome, IP producers successfully negotiated dramatic changes in the institutions of American political economy.<sup>23</sup> And these institutional changes, in turn, dramatically reversed the slow reduction in domestic IP production that unfolded throughout the 1960s and early 1970s (see Figure 1 Panel D) and which symbolized, for many, American technological decline.

A third insight is that, by making AKE development depend so intensely on IP, Democratic Party leaders all but had to abandon their Party's historical animosity towards rising industrial concentration and market power. The ideological pressures on the Party to jettison its historical commitments to robust antitrust enforcement came from several quarters, including a broader neoliberal critique that global integration, rather than government oversight through antitrust agencies, would better secure the conditions needed to keep American businesses engaged in intense competition.<sup>24</sup> But the Party's newly developed commitments to the AKE also motivated this shift. When President Reagan took office, the two biggest antitrust suits that remained on the books were those against technological leaders AT&T and IBM, and Reagan's top antitrust

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22. Patents on new technologies have value because they provide, for a limited time, a legal monopoly within a technological domain. The monopoly power inherent in each patent therefore provides its owner or producer with a temporary opportunity to generate rents or substantial economic returns beyond what would otherwise be observed in a more competitive economic environment. Joseph E. Stiglitz, *The Price of Inequality: How Today's Divided Society Endangers Our Future* (W.W. Norton and Company: New York and London, 2013), 54. Though a single blockbuster patent can confer tremendous economic power to its owner, a more conventional source of power lies in the ability of corporations to aggregate many patents into large portfolios, either through sustained in-house research and development or by purchasing or licensing patents developed by other firms. While a startup firm may develop one or a handful of patents, the IP producers that dominate the AKE today hold tens of thousands of patents.

23. Frank R. Baumgartner et al., *Lobbying and Policy Change: Who Wins, Who Loses, and Why* (The University of Chicago Press: Chicago and London, 2009), The state's participation makes it difficult to raise causal claims about business influence, but the story of IP producer lobbying from 1980-1994 potentially contravenes those studies which find that business interests have limited influence on government policy, that business power depends on economic crisis, or that business' lobbying successes in the 1980s were mostly defensive. See, e.g., David Vogel, *Fluctuating Fortunes: The Political Power of Business in America* (Basic Books, Inc., Publishers: New York, 1989); Benjamin C. Waterhouse, *Lobbying America: The Politics of Business from Nixon to NAFTA* (Princeton University Press: Princeton and Oxford, 2014); On the importance of the counterfactual perspective, see Daniel Carpenter and David A. Moss, eds., *Preventing Regulatory Capture: Special Interest Influence and How to Limit It* (Cambridge University Press: New York, 2014), 1-22.

24. Alan Greenspan, "Antitrust," chap. 4 in *Capitalism: The Unknown Ideal* (Penguin Publishing Group: New York, 1986); Lester Thurow, *The Zero-Sum Society: Distribution and the Possibilities for Change* (Basic Books: New York, 1980), 145-53.

official quickly dispatched with both.<sup>25</sup> When Democrats regained the presidency in 1992 and had the opportunity to enhance antitrust enforcement, the political consensus behind the AKE had gathered substantial momentum and companies like AT&T and IBM had become the U.S. equivalent of national champions. After going to such great lengths to broaden and strengthen IP rights to increase the global market power of the nation's technology titans, the Party could not reasonably restore a system of more interventionist antitrust oversight that might halt the titans' progress. The ideological tension created by this aspect of AKE development continues to generate intra-party conflict today, as progressive reformers call for breaking up some of the nation's biggest technology firms.

Many popular accounts of the Democratic Party's turn towards the knowledge economy emphasize the work of the New Democrats, led by Bill Clinton, after his victory in the presidential election of 1992. Admittedly, the Democratic Party's relationship to Silicon Valley was fully evident by the late 1990s when John Doerr, one of the nation's most prominent venture capitalists, had the Vice President's personal phone number on his speed dial and routinely organized teams of high-tech business managers to lobby the Clinton administration on everything from securities litigation reform and stock-option accounting to H1-B visas and charter schools.<sup>26</sup> But in this article, I view Clinton's victory in 1992 as the logical culmination of political forces that came into being roughly 20 years earlier when George McGovern won the Democratic Party's nomination in the presidential race of 1972. Those forces produced substantial institutional change hastening AKE formation during the Reagan and H.W. Bush administrations, but had mostly played out by the time Bill Clinton took office.

The argument is organized as follows. In Section 2, I characterize the "historical site of change"

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25. Matt Stoller, *Goliath: The 100-Year War Between Monopoly Power and Democracy* (Simon and Schuster: New York, 2019), 386–89.

26. Sara Miles, *The Democrats and Silicon Valley: How to Hack a Party Line* (Farrar, Straus & Giroux: New York, 2001).

encapsulated by the post-war consensus on macroeconomic policy and technological development, emphasizing the network of inter-related institutions that this consensus produced.<sup>27</sup> To emphasize that technological innovation was extremely important during this period, I will refer to this institutional matrix collectively as the American knowledge society (AKS). In Section 3, I show how Atari Democrats and IP producers substantially altered this institutional matrix to hasten AKE development focusing on three different geographies of political activism. Though the AKE is mostly a product of national politics, it is situated within a global knowledge economy from above and is abutted by entrepreneurial states from below. The history of AKE development conveyed in this section supports the claim that the AKE is fundamentally about IP, that Democratic Party officials and IP producers played a pivotal role in designing the institutions that continue to shape AKE development today, and that the Democratic Party's turn towards the AKE forced it to abandon its past concerns about market power. In lieu of analyzing a single component of AKE development or offering a single in-depth case study, I survey multiple important institutional changes to provide an overarching framework for understanding AKE development that might motivate future studies in greater historical depth. In Section 4, I conclude by summarizing the argument and suggesting ways in which contemporary politics is still shaped by the difficult political choices and outcomes generated in the AKE's formative years.

## **2 Political Institutions of the American Knowledge Society**

The post-war political consensus on economic policy and technological development, and the institutional matrix that this consensus produced, has nine major components, which are summarized in Table 1. First, in terms of macroeconomic management, both parties relied primarily on Keynesian tools for increasing aggregate demand, like robust social welfare policies that would

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<sup>27</sup>. Orren and Skowronek, *The Search for American Political Development*, 21.

increase consumption. In doing so, both parties were guided by the belief that these tools would create an economic environment conducive to maximizing aggregate private sector investments in research and development.<sup>28</sup> In contrast, the United States did not engage in the kinds of targeted, microeconomic, investment policies, or industrial policies, that—when paired with more orthodox fiscal policies for running budget surpluses—lay at the heart of post-war economic management in Germany and Japan. At the same time, international economic policy remained subservient to a foreign policy that prioritized the security benefits attained from rebuilding the economies of formerly fascist powers over the economic interests of domestic manufacturing firms. Accordingly, domestic manufacturers found themselves competing not with foreign firms, but with foreign governments, in an increasingly global marketplace.<sup>29</sup>

The political consensus underneath this form of diplomatic Keynesianism slowly evolved to recognize two domains in which the federal government would take a more pro-active role in facilitating technological development. In 1950, Congress created the National Science Foundation (NSF) to invest federal money in the kinds of pre-commercial scientific research usually conducted in universities, and to distribute those monies according to a meritocratic system of peer review. In articulating the NSF's role, Congress sided mostly with MIT engineer and Raytheon founder, Vannevar Bush, over alternatives advocated by progressive Senator Harley Kilgore. Kilgore had hoped to create a robust central agency for coordinating a science policy developed not just by elite scientists but by a broader range of interests, including labor. Kilgore also believed the NSF should promote competition rather than IP-based monopolies by investing in applied research and using non-exclusive licenses to disseminate the fruits of publicly funded research. Bush proved more politically adept. Congress ultimately created an agency that would be somewhat insulated

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28. David M. Hart, *Forged Consensus: Science, Technology, and Economic Policy in the United States, 1921-1953* (Princeton University Press: Princeton, 1998), Ch. 6.

29. Judith Stein, *Pivotal Decade: How the United States Traded Factories for Finance in the Seventies* (Yale University Press: New Haven and London, 2010).

from politics and would not interfere with corporate prerogatives on technological development or practice industrial policy.<sup>30</sup>

At the same time, ownership of patents on publicly funded technologies remained with the federal government and federal institutions developed a practice of broadly distributing IP through non-exclusive licensing, consistent with Kilgore's preferences. These norms of sharing and openness, held by government and university officials alike, are the AKS's second major feature. Some universities did petition federal agencies for the power to manage their own patents, but in their licensing agreements with private firms, those same universities often followed the federal government's practice of using IP to promote competition. For example, Stanford University licensed the Cohen-Boyer patents on recombinant DNA technology, the patents that launched the biotechnology revolution, on a non-exclusive basis to hundreds of organizations, despite private opposition from firms like Genentech and Cetus, because that approach was believed to be more consistent with the public-service ideals of the university.<sup>31</sup> As this example reveals, IP producers in the AKS were often divided because they had different institutional motivations, with public IP producers like government agencies and universities expressing norms of openness and sharing over norms of appropriation.

Slowly, a political consensus also emerged that existing financial institutions did not sufficiently invest in the small businesses, or startup companies, that could create new technological products to compete with those offered by more established firms. Accordingly, President Eisenhower first agreed to create a modestly funded Small Business Administration (SBA) if Congress would

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30. Daniel Lee Kleinman, *Politics on the Endless Frontier: Postwar Research Policy in the United States* (Duke University Press: Durham and London, 1995); Hart, *Forged Consensus: Science, Technology, and Economic Policy in the United States, 1921-1953*.

31. Maryann P. Feldman, Alessandra Colaianni, and Connie Kang Liu, "Lessons from the Commercialization of the Cohen-Boyer Patents: The Stanford University Licensing Program," in *Intellectual Property Management in Health and Agricultural Innovation: A Handbook of Best Practices* (Centre for the Management of Intellectual Property in Health Research and Development: Oxford, 2007), accessed August 6, 2021, <http://www.iphandbook.org/handbook/chPDFs/ch17/ipHandbook-Ch%2017%2022%20Feldman-Colaianni0Liu%20Cohen-Boyer%20Patents%20and%20Licenses.pdf>.

eliminate the Reconstruction Finance Corporation in 1952. And in 1958, Congress gave the agency the power to support and oversee privately operated Small Business Investment Companies (SBIC) that would lend to and purchase stock in promising small businesses. The Kennedy administration aggressively promoted SBICs and while, in the early years, only 10 percent of SBIC funds accrued to technology startups, the SBICs would ultimately lay the groundwork for the modern venture capital industry.<sup>32</sup>

The way in which these early political debates unfolded ultimately committed the United States to a heavily decentralized and unplanned form of science and technology policy, which is the third component of the AKS's institutional matrix.<sup>33</sup> Part of the reason the NSF could not obtain a broader mandate is that, in the eight years (from 1942 to 1950) that it took to achieve consensus over its founding, Congress created other agencies—the Atomic Energy Commission, the Office of Naval Research, the Joint Research and Development Board, and the National Institutes of Health—that had jurisdictional claims in the nation's technological development. These institutions then opposed the political effort to consolidate and centralize power under the umbrella of the NSF. The AKS achieved some coordinating power with the creation of the Office of Science and Technology (the predecessor of the modern Office of Science and Technology Policy) within the White House in 1962, but having no power over the aggregate research budget, it would play a more limited role by wrangling the pluralist system of agencies with scientific priorities.<sup>34</sup>

As the Cold War unfolded, the basic Keynesian consensus that produced the AKS merged much more deeply with the national interest in developing technologies to meet national security imperatives, the fourth component of the AKS's institutional setting. In 1950 the Korean War began and in 1957, the Soviet Union placed the first artificial satellite into orbit. Though national security impera-

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32. Hart, *Forged Consensus: Science, Technology, and Economic Policy in the United States, 1921-1953*, 171-2.

33. Fred Block, "Swimming Against the Current: The Rise of a Hidden Developmental State in the United States," *Politics and Society* 36, no. 2 (2008): 169-206.

34. Kleinman, *Politics on the Endless Frontier: Postwar Research Policy in the United States*, 152,176-77.

tives influenced most if not all federal institutions of scientific and technological development,<sup>35</sup> those imperatives found their most influential expression in the nascent venture capital industry with the creation of the Defense Advanced Research Projects Agency, or DARPA, in 1958. The federal government always had the power to shape the technological prerogatives of its defense contractors through the procurement process, but this required massive amounts of investment and the government's flexibility virtually dissolved upon entering into a contract. DARPA proved that the government could use much smaller amounts of money to generate intense competition for the development of new technologies on ambitious time frames, especially since its legislative authorization removed the elaborate grant writing and refereeing procedures utilized by the NSF and gave the agency the discretion to start and *stop* funding as it deemed necessary.<sup>36</sup> But even outside of DARPA, the AKS nurtured deep ties with the national security state in both civilian venture capital and academic research.<sup>37</sup>

In the AKS of the post-war period, patents were an established but contentious policy tool for promoting technological development. In 1938, President Roosevelt appointed patent reformer, Thurman Arnold, to lead the antitrust division of the Department of Justice (DOJ). Arnold viewed patents as a monopolistic device that enabled corporate managers to inhibit technological development, create cartels, raise prices, and stifle economic growth. Arnold and his successor, Wendell Berge, could not convince Congress to reform the nation's patent laws, so they instead deployed the full force and power of the DOJ against established corporations with large patent holdings. During Arnold's five-year tenure, the DOJ instituted 213 investigations and 93 lawsuits, almost as many as had been filed over the prior 48 years, and Arnold and Berge together succeeded in

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35. Shelley L. Hurt, "The Military's Hidden Hand: Examining the Dual-Use Origins of Biotechnology in the American Context, 1969-1972," chap. 2 in *State of Innovation: The U.S. Government's Role in Technology Development*, ed. Fred Block and Matthew R. Keller (Paradigm Publishers: Boulder and London, 2011); Linda Weiss, *America Inc.? Innovation and Enterprise in the National Security State* (Cornell University Press: Ithaca and London, 2014).

36. Fred Block, "Innovation and the Invisible Hand of Government," chap. 1 in *State of Innovation: The U.S. Government's Role in Technology Development*, ed. Fred Block and Matthew R. Keller (Paradigm Publishers: Boulder and London, 2011).

37. Hart, *Forged Consensus: Science, Technology, and Economic Policy in the United States, 1921-1953*, 172.

forcing corporations to license their patents more broadly (compulsory licensing) in at least 107 cases involving about 40,000 patents. Aggressive levels of antitrust enforcement in turn influenced business strategy, as established firms turned away from the practice of acquiring the technology of emerging competitors to focus instead on promoting in-house research and development.<sup>38</sup> Patents remained a constitutionally sanctioned tool to protect upside investments in new technologies, but antitrust officials heavily policed the downside anti-competitive risks. The DOJ's commitment to policing patent abuse constitutes the fifth feature of the AKS.

A sixth feature of the AKS was that patent lawsuits were treated just like any other case involving federal law: the case was first tried in a local district court and then, if either of the parties appealed the case, the appeal went to the regional circuit court. This institutional structure created opportunities for circuit splits on important legal questions as the circuit courts adopted conflicting perspectives that only the Supreme Court could reconcile. Patent cases were no exception and most of the circuit courts viewed patents with skepticism (consistent with prevailing attitudes at the DOJ) though at least three circuits developed a more pro-patent reputation. Members of Congress accepted the conflict that this structure created because it tended to sharpen legal arguments before the Supreme Court was asked to intervene. But they also believed that distributing power among several circuit courts helps to avoid the problems of regulatory capture that can arise with courts of specialized jurisdiction. In 1975, for example, a special Commission rejected a proposal to create a special court that would hear all appeals in patent cases nationwide, warning that the judges would suffer from "tunnel vision" and be susceptible to the influence of special interests.<sup>39</sup>

Seventh, the anti-patent skepticism protected by the judiciary's structure inspired the development

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38. Hart, *Forged Consensus: Science, Technology, and Economic Policy in the United States, 1921-1953*; David M. Hart, "Antitrust and Technological Innovation in the US: Ideas, Institutions, Decisions, and Impacts, 1890-2000," *Research Policy* 30 (2001): 923-936.

39. F.M. Scherer, "The Political Economy of Patent Policy Reform in the United States," *Journal on Telecommunications and High Technology Law* 7 (2009): 167.

of a body of federal case law that imposed restraints on the use of patents. For example, though exploratory research and development could technically cause a firm to be liable for patent infringement, a common law “research exemption” protected those who made or used a patented invention for purposes of testing the patent’s written disclosure and determining whether the invention works as claimed.<sup>40</sup> Similarly, the doctrine of sovereign immunity shielded state universities and agencies from patent infringement liability.<sup>41</sup> The defense of “patent misuse” allowed those accused of infringement to avoid liability by showing that the patent holder acted in derogation of federal patent policy.<sup>42</sup> When the Supreme Court intervened in patent disputes it would often emphasize the limits of patent law. In 1969, for example, the Court argued that the Sherman Act “made it clear that the grant of monopoly power to a patent owner constituted a limited exception to the general federal policy favoring free competition.”<sup>43</sup> Legal doctrines like these created uncertainty in the legal framework governing IP rights which in turn made it difficult for IP producers to leverage their patents to extract rents.

Eighth, the AKS remained situated in a global economy that prioritized democratic procedures for determining how nations across the globe would leverage IP. The Paris Convention for the Protection of Industrial Property of 1883 remained the dominant legal framework at the global level, but the World Intellectual Property Organization (WIPO) within the United Nations took over its administration after 1974. IP issues that did not fall within WIPO’s jurisdiction were generally handled by the United Nations Conference on Trade and Development (UNCTAD) which sought to maximize trade, investment, and economic development but also to integrate developing countries into the world economy on an equitable basis, a goal that, according to some, could not be achieved under the General Agreement on Trade and Tariffs. As agencies of the United Nations with broad

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40. *Whittemore v. Cutter*, 29 F. Cas. 1120 (Cir. Ct. Mass 1813).

41. *Atascadero State Hosp. v. Scanlon*, 473 U.S. 234, 242 (1985).

42. Robin C. Feldman, “The Insufficiency of Antitrust Analysis for Patent Misuse,” *Hastings Law Journal* 55 (2003): 399.

43. *Lear, Inc. v. Adkins*, 395 U.S. 653, 663 (1969).

membership, both WIPO and UNCTAD gave developing nations, including many former colonies, substantial political power in shaping negotiations over global IP rights through its one country, one vote procedures.

As has been true throughout American history, much of the initiative for engaging in more activist policies to promote economic development in the AKS resided within the states. At the same time, the dominant policy tools that state governments used to promote economic development were zero-sum devices like promising tax benefits or anti-labor policies to lure established businesses away from one region and into another. This dominant approach to regional economic development is the AKS's ninth major feature. The Southern states largely pioneered the use of the devices, and they may have been effective in luring manufacturing into the region, but they also had limitations. State governments often granted these incentives with no strings attached, leaving many in the position of the cuckold after choosing a partner with a history of being unfaithful. Firms that are willing to leave New England for South Carolina might, after all, be just as willing to leave South Carolina for Mexico or China. The zero-sum nature of the incentives also created inter-jurisdictional conflict and as more states came to offer the same set of incentives, the devices lost some of their ability to significantly influence managerial decision-making. These limitations would become more troubling in the 1970s. Throughout most of the post-war period, these devices remained the primary tool for shaping economic development at the state level, and state leaders used them not to promote technological development but to relocate jobs from one state to another.<sup>44</sup>

In sum, the AKS was rooted in a diplomatic form of Keynesian economic management that subsidized the reconstruction of formerly fascist powers and that used broad, untargeted tools like R&D tax credits to spur investment in new technologies paired with a decentralized matrix of new

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44. Peter K. Eisinger, *The Rise of the Entrepreneurial State: State and Local Development Policy in the United States* (The University of Wisconsin Press: Madison, 1988); Otis L. Graham, *Losing Time: The Industrial Policy Debate* (Harvard University Press: Cambridge and London, 1992).

institutions, like DARPA and the NSF, committed to ensuring the nation's technological supremacy during the Cold War. Firms could and did patent their inventions, but Keynesian tools, not IP, were the preferred mechanism for incentivizing technological investment in the private sector. On the contrary, antitrust officials aggressively policed anti-competitive abuses by the largest private IP producers while public IP producers, for their part, remained committed to norms of openness and sharing rather than appropriation. The politics of the AKS was inherently federal as state officials pursued economic prosperity through zero-sum devices that lacked any coherent vision for promoting local innovation, and the skepticism developing nations had towards IP kept global institutions focused on other objectives. Both the institutional structure for adjudicating patent cases and the substance of federal patent law perpetuated a skepticism as to whether IP played a valuable role in the American political economy.

In all but two of these characteristics, the AKS is distinct from the AKE. When it comes to these nine institutions, the only ways in which the AKE resembles the AKS is in its continued reliance on a heavily decentralized mode of investing in technological development at the federal level and in its deep ties to the national security state. As the Democratic Party turned towards the AKE, and as IP producers became the heroes in the nation's story of economic salvation, the seven remaining components of the AKS would either be abandoned or experience substantial reform.

### **3 Political Alternatives to Keynesian Decline and the Atari Democrats**

The 1970s unraveled the Keynesian consensus that lay at the foundation of the AKS. The post-war project of rebuilding the Japanese and German economies by giving their firms preferential access to American consumers succeeded on a much quicker timescale than anyone had anticipated. As the United States found its dominant position in global technology and commodity markets

threatened, its elected officials struggled to develop post-Keynesian alternatives for producing economic prosperity. Traditional tools like tax cuts and government spending could still be used to increase consumption, but as domestic markets became more exposed to foreign imports, more and more of that consumption would accrue to the benefit of foreign producers. Financing more spending through deficits brought additional challenges, as foreign governments could purchase the dollar-denominated assets that underwrote deficits (government bonds) which would prevent the dollar from naturally adjusting against foreign currencies and would allow trade imbalances to persist. The Federal Reserve could lower interest rates to try and stimulate investment, but at a risk of exacerbating inflation and, with no capital controls, that investment could simply move overseas. Food shortages, rising mortgage rates, and America's dependence on foreign oil cartels produced exceptionally high levels of inflation that elected officials from both parties tried to manage on the backs of American workers, freezing wages and advocating for yet more global competition to reduce prices.<sup>45</sup> And that inflation accelerated in the midst of economic stagnation, not expansion as Keynes had predicted, creating a pervasive anxiety that the old order was broken and that the nation had found itself in a new and unforeseen state of "stagflation."<sup>46</sup>

The political failures at the heart of this economic calamity produced, in turn, dramatic changes within both political parties. The Republican Party somewhat quickly settled on an alternative based on the market fundamentalism associated with economists like Friedrich von Hayek and his followers at the Chicago School of Economics. President Reagan interpreted his victory in 1980 as an absolute mandate against Keynesian economics and pursued a radically different vision rooted in tax cuts financed by foreign borrowing, expansive deregulation, and greater global economic and financial integration.<sup>47</sup>

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45. Stein, *Pivotal Decade: How the United States Traded Factories for Finance in the Seventies*.

46. Walter S. Salant, "The Spread of Keynesian Doctrines and Practices in the United States," chap. 2 in *The Political Power of Economic Ideas: Keynesianism Across Nations*, ed. Peter A. Hall (Princeton University Press: Princeton, 1989).

47. Stein, *Pivotal Decade: How the United States Traded Factories for Finance in the Seventies*; Binyamin Appelbaum, *The*

The Democratic Party's response emerged only gradually over the course of the 1970s. In some ways, the Democratic turn towards the knowledge economy began in 1972. In the presidential election of that year, George McGovern became the first Democratic candidate to overtly court suburban knowledge economy workers in places like Boston's Route 128 corridor and Southern California with an economic message of patent reform and technological innovation. McGovern's target audience worked primarily in the defense and aerospace industries and faced increasing unemployment from severe cuts in military spending during President Nixon's first term; they connected with McGovern's message of igniting an economic conversion in which federal science and technology policy would be deployed to achieve peacetime objectives, like energy independence and environmental protection, rather than military preparedness. As political activists, these same workers played a crucial role in propelling McGovern to victory in the Democratic primary.<sup>48</sup>

The evolution of Democratic Party platforms in this period similarly suggests that, in 1972, McGovern attempted to change the Party's conception of the relationship between technology and the economy. The Party's 1964 platform, for example, argues that conventional macroeconomic policy will be used to continue the "42 months of uninterrupted [economic] expansion" that began with President Kennedy's tenure in 1961. The document mentions "technology" 14 times, but mostly in relation to the space program. It acknowledges a link between technological change and increasing productivity and higher living standards but conceived of such a relationship as flowing mostly from automation.<sup>49</sup> The Party's 1968 platform displays similar notions. It is the first to contain that all important buzzword of the AKE—innovation—but the Party's pledge, in this context, was to "[a]ssist small business in taking advantage of technological innovations," not to

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*Economists' Hour: False Prophets, Free Markets, and the Fracture of Society* (Little Brown and Company: New York, 2019).

48. Lily Geismer, *Don't Blame Us: Suburban Liberals and the Transformation of the Democratic Party* (Princeton University Press: Princeton, 2015), Ch. 6.

49. "One Nation, One People (The 1964 Democratic Party Platform)," *The American Presidency Project*, 1964, accessed August 6, 2021, <https://www.presidency.ucsb.edu/documents/1964-democratic-party-platform>.

promote small business (or startups) as engines of innovation. Many of the remaining references to technology indicate the Party's commitment to ameliorating the social and environmental "hazards" and "complexities" that the "march of technology" had wrought. The document asserts that the United States was supreme in its technological capacity and that the Party's challenge was to deal with the social and environmental costs of that supremacy, consistent with escalating regulatory demands of the third-wave consumer movement.<sup>50</sup>

But the Party's 1972 platform begins with an entirely different proposition: that the nation's technology supremacy was in decline because the Nixon administration had let defense and aerospace programs languish. The Party therefore pledged to substantially increase public and private sector investment in research and development, to rethink the relationship between government and industry when it comes to technological development, and to apply the fruits of technological experimentation in aerospace and defense "to the city, the environment, education, energy, transportation, health care and other urgent domestic needs."<sup>51</sup> McGovern's early effort to redefine the Party's relationship to technological change was famously unsuccessful, however. In the general election against Richard Nixon, McGovern lost in every state except Massachusetts leading to one of the most lopsided electoral college victories (520-17) in the nation's history. Unsurprisingly, technological development was a marginal concern in the Party's 1976 platform, which focuses much more heavily on dealing with unemployment and inflation.<sup>52</sup>

But as the economic crisis of the 1970s accelerated during the Carter Administration, it became clear that the Democratic Party, in the throes of the New Left, had no vision for producing economic

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50. Lizabeth Cohen, *A Consumer's Republic: The Politics of Mass Consumption in Postwar America* (Vintage Books: New York, 2003); "The Terms of Our Duty (The 1968 Democratic Party Platform)," *The American Presidency Project*, 1968, accessed August 6, 2016, <https://www.presidency.ucsb.edu/documents/1968-democratic-party-platform>.

51. "New Directions: 1972-76 (The 1972 Democratic Party Platform)," *The American Presidency Project*, 1972, accessed August 6, 2016, <https://www.presidency.ucsb.edu/documents/1972-democratic-party-platform>.

52. "No Title (The 1976 Democratic Party Platform)," *The American Presidency Project*, 1976, accessed August 6, 2016, <https://www.presidency.ucsb.edu/documents/1976-democratic-party-platform>.

prosperity. In tilting so hard against the corruption of the Watergate era and challenging the legitimacy of the entire system of democratic capitalism, activist voices within the Democratic Party failed to produce any meaningful alternative to Keynesianism. In fact, their acerbic attack on capitalism ignited a dramatic response by the managers of manufacturing firms who bridled at the accusation that they were responsible for all of the nation's social and economic turmoil.<sup>53</sup> Many business managers became active in politics in the middle of the decade to halt what they accurately perceived to be the decline in domestic manufacturing and its roots in poor economic management, with persistent budget deficits that crowded out private borrowing, reduced capital formation, and structurally disadvantaged exports. The New Left remained aloof to their plight. The pejorative many Democratic officials used to refer to American manufacturers—"smokestack industries"—succinctly captured their indifference to American industrial decline and the havoc it was wreaking across the nation. That indifference extended not just to corporate employers but also to blue collar employees as organized labor found itself on the outside looking in at the Party's 1976 convention.<sup>54</sup>

Ultimately, if slowly, the Democratic Party found its alternative to Keynesianism at the very end of the decade in the idea of the AKE, as domestic economic malaise juxtaposed with the miraculous ascendance of Japanese and German industry became politically intolerable. To restore global competitiveness and increase productivity, the nation would try to leverage its advantage in producing not knowledge, per se, but IP—a commodified form of knowledge embodied in patents that would allow IP producers to extract substantial economic rents in global marketplaces. The Party's rhetoric about innovation and entrepreneurship found easy support among those liberals for whom an economy that conferred yet more wealth and status on the highly educated sounded

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53. Leonard Silk and David Vogel, *Ethics and Profits: The Crisis of Confidence in American Business* (Simon and Schuster: New York, 1976); Vogel, *Fluctuating Fortunes: The Political Power of Business in America*.

54. Stein, *Pivotal Decade: How the United States Traded Factories for Finance in the Seventies*; Waterhouse, *Lobbying America: The Politics of Business from Nixon to NAFTA*.

ideal. But the Party's vision for the AKE was primarily shaped by other actors and constraints. As indicated below, it was profoundly shaped by the IP producers that rewrote global trade agreements and advised presidential administrations on industrial innovation policy and economic competitiveness. And it was shaped by the unique nature of American political institutions, as the imperatives of divided government forced a significant narrowing of Democratic aspirations. But it was also substantially shaped by the political entrepreneurship of a faction within the Democratic Party who came to be known (sometimes derisively) as the Atari Democrats.

The Atari Democrats were a group of neoliberal Democrats, many of them "Watergate babies" from the class of 1974, who grew increasingly indifferent in the late 1970s to the social welfare programs of the prior decade that mostly defined the Party's legacy. The most prominent Atari Democrats in Congress included Colorado Senator Gary Hart (George McGovern's former campaign manager), his successor Tim Wirth, Massachusetts Congressman (and later Senator) Paul Tsongas, and Tennessee Senator Al Gore. But they also included some newly elected Democratic governors with aspirations for federal office, like California's Jerry Brown, Massachusetts' Michael Dukakis, and (later) Arkansas' Bill Clinton. As a subset of the Party's emerging neoliberal faction, the Atari Democrats were bound together by the tenets of the neoliberal perspective: that the Party's primary role was to promote economic growth not implement economic redistribution, that doing so required proactively thinking about the future rather than reactively fighting against injustices of the past, and that the government had to accept hard constraints on what it could accomplish and look for ways of collaborating with the private sector to achieve its goals. But the Atari Democrats additionally believed that technological innovation and small-business entrepreneurship were the key to generating economic prosperity and remedying a host of social and environmental problems.<sup>55</sup>

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55. Randall Rothenberg, *The Neoliberals: Creating the New American Politics* (Simon and Schuster: New York, 1984), 15-25,79-91; Geismer, *Don't Blame Us: Suburban Liberals and the Transformation of the Democratic Party*, 268-71.

The Atari Democratic vision for the AKE was shaped by economic thinking, especially the theory of Joseph Schumpeter and the empirical findings of David Birch, but also by their individual experiences in dealing with American industrial decline and the challenge of producing economic growth in a world of limited resources.<sup>56</sup> As a Senator, Paul Tsongas helped negotiate an agreement in the early 1980s to convince computer company, Wang Laboratories, to locate in his hometown of Lowell, Massachusetts, a longstanding hub of textile manufacturing that was, at the time, being torn asunder from deindustrialization. Jerry Brown spoke of similar motivations based on an epiphany he had while touring New England during his 1980 presidential bid. Cognizant of the resource constraints at the heart of “no growth” liberalism and observing first-hand what no growth meant to communities experiencing deindustrialization, Brown came to see the successes of the Silicon Valley (already evident in 1980) as a path forward. As Brown’s chief economic advisor described Brown’s transformation, “When he came home from the campaign all of a sudden it was crystal clear. His concerns had been fused: One, industrial decay; two, the resource trap; and three, high-tech.”<sup>57</sup>

The intra-party debates over the Party’s future were fractious, and the Atari Democrats did not succeed in realigning the Party towards the AKE overnight. When President Reagan decisively defeated incumbent, Jimmy Carter, in 1980, their movement gained momentum, but they still faced resistance from other parts of the Party membership. In 1982, Tim Wirth worked with Dick Gephardt of Missouri and Gillis Long of Louisiana to develop and publish the House Democrats’ new vision for economic growth rooted in technological development, partnerships with private industry, and adjustment assistance for displaced workers. Only nine months later, a rival faction of 148 House members produced a contrary statement, one which failed to win the Speaker’s

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56. Joseph A. Schumpeter, *The Theory of Economic Development*, 16th ed. (Transaction Publishers: New Brunswick and London, 2012); David Birch, *The Job Generation Process* (M.I.T. Program on Neighborhood and Regional Change, 1979); Rothenberg, *The Neoliberals: Creating the New American Politics*, Chs. 6-7.

57. Rothenberg, *The Neoliberals: Creating the New American Politics*, 64-67,81-83.

endorsement but nevertheless revealed the growing schism within the Party.<sup>58</sup>

In the physical world, Newton's third law suggests every action is met with an equal and opposite reaction; in the social world, similar laws suggest that most attempts to create new forms of political or economic power are often met with forceful counter-mobilizations or, to use an economic term, the creation of countervailing power.<sup>59</sup> Predictably, then, as the Atari Democrats pushed the Democratic Party to speak more forcefully on behalf of the suburban, middle-class professionals invested in the knowledge economy, they encountered forceful resistance from the Republican opposition. The Republican Party's alternative to Keynesianism, rooted in market fundamentalism, sought to promote economic growth by minimizing the role of the state in the economy and party leaders could not support policies that sought to enhance the state's role, even if for the sake of stoking technological development. Political conservatives therefore began portraying deindustrialization as a myth and, with the support of organized business interests, argued that new industrial policies would devolve into an exercise where the state was "picking industrial winners" or protecting industrial losers.<sup>60</sup> As early as 1975, Irving Kristol, the godfather of neoconservatism, blamed "mass education" for creating a "New Class" of liberals who were "sent to college in order to help manage its affluent, highly technological, mildly paternalistic, 'post-industrial society'" and warned that this New Class was an elitist and vehemently anti-capitalist group.<sup>61</sup> In later years, sensing that the Democratic Party's emphasis on college education might allow liberals to build a durable multi-racial and worker-inclusive political coalition, political conservatives initiated a long-lasting culture war to discredit public universities and undermine the political status of the

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58. Edward Cowan, "Democrats Offer New Policy to Sustain National Growth," *The New York Times*, Sept. 19, 1982, Section 1, Page 28; Edward Cowan, "Washington Watch; A Democratic Rift," *The New York Times*, May 30, 1983, Section 1, Page 36.

59. Robert A. Dahl, *Who Governs? Democracy and Power in an American City* (Yale University Press: New Haven and London, 2005); John Kenneth Galbraith, *American Capitalism: The Concept of Countervailing Power* (Martino Fine Books: Eastford, 2012).

60. Graham, *Losing Time: The Industrial Policy Debate*, Ch. 7.

61. Irving Kristol, "On Corporate Capitalism in America," *The Public Interest* 41 (1975): 134-35; Waterhouse, *Lobbying America: The Politics of Business from Nixon to NAFTA*, 42.

knowledge economy workers that they produced.<sup>62</sup>

In a setting of divided government, these developments significantly narrowed the set of potential institutional reforms that were available to hasten knowledge economy formation. In a sense, as the Democratic Party turned towards Schumpeter and the Republican Party turned towards Hayek, the fragmented power of American political institutions all but guaranteed that new laws and institutions promoting the AKE would have to occupy the small space where Schumpeter and Hayek agreed. And that small space was defined by new policies, like patent reform, that sought to rectify what economists referred to as “market failures” in the innovation environment while minimizing the state’s role in shaping economic outcomes.

The archival records and legislative record of one Atari Democrat, Paul Tsongas, illustrates this narrowing of Democratic aspirations. First and foremost, those records suggest that Tsongas went to great lengths to ensure his policy proposals aligned with the demands of high-tech business managers. For example, the records show Tsongas surveying business leaders, like J.A. Marshall of DataCon, to better understand high-tech’s position on U.S.-Japanese trade relations.<sup>63</sup> They show him advertising his legislative “record in high technology” to business managers like John Moriarty of Data General.<sup>64</sup> And they show him soliciting feedback on new policy proposals from business managers like Fred Garry of General Electric.<sup>65</sup> In these and other ways, Tsongas worked to keep his new policy proposals consistent with high-tech business demands and those demands tended to focus on policies that shunned any meaningful new role for state action. In providing

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62. Christopher Newfield, *Unmaking the Public University: The Forty-Year Assault on the Middle Class* (Harvard University Press: Cambridge and London, 2008), Ch. 1.

63. Paul E. Tsongas, “Letter to J. S. Marshall from Senator Paul E. Tsongas requesting help on a matter of great importance to the high technology industry of Massachusetts,” Paul Tsongas Digital Archives, accessed October 21, 2021, <https://ptsongasuml.omeka.net/items/show/3725>.

64. Mitchell G. Tyson, “Tsongas record in High Technology,” Paul Tsongas Digital Archives, accessed October 21, 2021, <https://ptsongasuml.omeka.net/items/show/1244>.

65. Fred W. Garry, “Letter to Paul E. Tsongas from Fred W. Garry: Improving federal policies affecting technological innovation and industrial competitiveness,” Paul Tsongas Digital Archives, accessed October 21, 2021, <https://ptsongasuml.omeka.net/items/show/3299>.

comments for Tsongas' proposal to create a new Agency for Technological Innovation, for example, Fred Garry of General Electric rejected the idea of creating new agencies to match Japan's MITI as these agencies would substitute "government judgment for that of business managements in the allocation of industrial resources. . .," but he favored proposals that would strengthen patent rights, give industry exclusive rights to IP develop with federal funds, and increase the tax write-offs for "acquired technology, including unpatented know-how."<sup>66</sup>

Tsongas also tried to advance new policies that arguably would have met middle-class demands, but when he did so, he was generally unsuccessful. He introduced the High Technology Morrill Act (98 S.631), which would have sequestered a tax on resource extraction from federal lands to create a \$2.5 billion trust fund to improve the quality of science and technology education in the United States. But the bill was ultimately whittled down to a much smaller experimental effort with \$90 million appropriated in two fiscal years, and it was incorporated into a much larger bill disbursing conventional block grants consistent with conservative demands (98 S.1285). Even here, on an issue promoting middle-class demands to improve educational access and quality, Tsongas designed his proposal in a way that would only disburse funds to universities that partnered with industry. Tellingly, when he took to the floor of the Senate to support the proposal, he did so not on grounds that the bill had broad popular support, but that it was firmly supported by the members of the Massachusetts High Technology Council, a lobbying consortium of over 100 high-tech business managers. In the same Congress, Tsongas also introduced bills that would have promoted skills training and education for U.S. workers (98 S.2111), required the National Academies to form panels with industry representation to advise Congress on economically strategic technologies (98 S.248), and created a new Agency for Technological Innovation with the power to coordinate the government's role in promoting technological development (98 S.3071). None of these proposals

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66. Ibid.

advanced beyond introduction.

In contrast, Tsongas generally succeeded in promoting new policies that either reduced the role of the state in the economy or sought to rectify market failures in the innovation environment. In advertising his legislative record on high-tech issues, he claimed to be “one of the first to introduce and advocate legislation in 1982 to relax antitrust laws to encourage the formation of joint R&D ventures” and he “supported the industry position which provides for ... full immunity...”<sup>67</sup> This proposal was again advanced in the 98th Congress by Strom Thurmond (R-SC) and ultimately became law (PL98-462). Tsongas also held himself out as a major supporter and co-sponsor of legislation that ultimately became the Small Business Innovation Research Act (PL97-219).<sup>68</sup> That Act effectively created a federal venture capital fund within the Small Business Administration to remediate the market failure flowing from the concentration of technological investment within large firms and established universities despite evidence that small businesses were the principal source of technological innovation in the United States. The bill that created these funds (97 S.881) also generated significant bi-partisan support and was co-sponsored by three Republicans, including Orrin Hatch (R-UT).

In short, Tsongas succeeded when he advanced bills that met business demands and that aligned with conservative thinking about macroeconomic management, but he generally failed when he attempted to advance bills that met much broader middle-class demands to improve the quality of the nation’s educational system, increase opportunities for job training and “up-skilling,” or to align the full force of the national government behind a set of concretely defined technological objectives. Tsongas even seems to have been aware of the power imbalance between organized business interests and the middle-class voters committed to the project of building a knowledge

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67. Mitchell G. Tyson, “Tsongas record in High Technology,” Paul Tsongas Digital Archives, accessed October 21, 2021, <https://ptsongasuml.omeka.net/items/show/1244>.

68. Ibid.

economy. For example, Tsongas joined an organization called the National Coalition for Science and Technology and signed a letter urging other members of the “science and technology community” to join on grounds that their interests were “near the very bottom of the list” when it comes to special interest representation in Washington and that, if this situation continued, “we risk seeing this country fall behind other nations that do give appropriate emphasis to science education and research.”<sup>69</sup> Paul Tsongas was only one Atari Democrat, though his position as the head of the Innovation Working Group of the Senate Democratic Policy Committee made him an important representative of the group’s demands. And yet, the struggles he faced in advancing his own legislative agenda largely explain, at a granular level, why policies that would have promoted AKE formation through human capital formation and public investment largely failed, while those that focused on IP and rectifying market failures largely succeeded, as documented in Figure 1.

In many ways, the Democratic Party’s relationship with the AKE would not become settled until 1992, when Bill Clinton’s victory in that year’s presidential race demonstrated that the neoliberal vision of an AKE had electoral viability. And yet ironically, by 1994, only two years into Clinton’s first term, the AKE’s formative period came to a close as most of the policy reforms that define the institutional complex of the AKE had already become law. Against the background of severe electoral losses in presidential elections throughout the 1980s—Jimmy Carter in 1980, Walter Mondale in 1984, and Michael Dukakis in 1988—IP producers and Atari Democrats worked within the constraints of divided government to produce major policy reforms in the one market-oriented domain of technology policy on which they could garner substantial bi-partisan support: intellectual property law. The last major such reform came at the end of 1994, when President Clinton signed the Uruguay Round Agreements Act which converted the General Agreement on Trade and Tariffs (GATT) into the World Trade Organization (WTO) and bound member nations to

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69. Paul E. Tsongas, “Letter urging support for National Coalition for Science and Technology,” Paul Tsongas Digital Archives, accessed October 21, 2021, <https://ptsongasuml.omeka.net/items/show/3248>.

the Agreement on the Trade-Related Aspect of Intellectual Property Rights, or TRIPS.

## 4 Three Geographies of American Knowledge Economy Development

### 4.1 The Global Knowledge Economy

The story of how IP producers in the United States changed institutions for negotiating multilateral trade agreements to create the global knowledge economy (GKE) is a story of surprising corporate influence over global economic policy, though it has failed to elicit much interest in international political economy or the lobbying sub-discipline of American politics. The story culminates with the adoption of TRIPS in 1994. In essence, TRIPS required member nations, including many developing nations, to draft and enforce IP laws that met certain basic criteria. The leaders of many developing nations viewed the agreement as a new form of colonialism. They begrudgingly assented because they needed access to U.S. markets in agricultural products and textiles, and IP producers succeeded in making that access contingent upon accepting TRIPS.

Two business managers—the chief executive of Pfizer, Edmund Pratt, and of IBM, John Opel—played a central role in the passage of TRIPS, but in doing so, they represented a much broader coalition of domestic IP producers that relied intensely on patents to compete in the global economy. In 1986, Pratt and Opel organized an interest group known as the Intellectual Property Committee (IPC) to push global patent reform onto the agenda for the next round of trade negotiations under the GATT. The IPC consisted of the executives of Pfizer, IBM, Merck, General Electric, Du Pont, Warner Communications, Hewlett-Packard, Bristol-Myers, FMC Corporation, General Motors, Johnson & Johnson, Monsanto, and Rockwell International.<sup>70</sup> General Motors was the only firm that could be characterized as a domestic manufacturer and its motives for participating are

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70. Michael P. Ryan, *Knowledge Diplomacy: Global Competition and the Politics of Intellectual Property* (Brookings Institution Press: Washington D.C., 1998), 11,67-68; Scherer, "The Political Economy of Patent Policy Reform in the United States," 204.

unknown. The remaining companies were all multinational IP producers in aerospace and defense, pharmaceuticals and chemicals, computer hardware and telecommunications, and agritech.

The IPC's main political achievement was to create an international coalition of IP producers that shifted the forum for negotiations over global patent reform from the UN to GATT. IP producers had first pushed for global patent standards in 1981 and 1982 by way of a revision to the Paris Convention before the UN agency, WIPO. Developing nations opposed these efforts on grounds that turning American patent law into a global standard would undermine their ability to do things like manage public health crises. For example, in the 1980s, South Africa could import patented HIV drugs at low prices to deal with its AIDS crisis because manufacturers could legally locate in places that either had no patent law or had a patent law that did not allow for drug patents or used compulsory licenses to force drug manufacturers to take much smaller royalties on sales in developing nations. Purging this heterogeneity in national patent laws would therefore hobble the South African government in its ability to fight an epidemic. For the leaders of many developing nations, IP producers could already enforce patents and charge supra-competitive prices to affluent consumers in developed countries which provided sufficient rents to encourage innovation. For IP producers, substantial rents were lost on what they perceived as IP theft. Standardizing patent laws would expand the geographic scope of their IP so that each new piece of IP they produced could potentially earn a market position approaching global monopoly.

The political problem that IP producers encountered was that the UN's democratic one country, one vote procedures—an institutional legacy of the AKS—allowed developing nations to form a coalition that opposed global patent standards. Accordingly, IP producers pursued the same reforms under GATT where developed nations had more influence and where global patent standards could be linked to other issues that developing nations cared about like agricultural tariffs. Such a strategy might have failed if the IPC had pursued it alone, but they built a global coalition of IP producers

from within the Japanese Keidanren and the Union of Industrial and Employers' Confederations of Europe (UNICE). Together with some Canadian companies, "the Quad" successfully lobbied their respective governments to add IP standards to the Ministerial Declaration that defined the basis for the Uruguay Round of trade negotiations in 1986. Subsequently, during negotiations, U.S. officials refused to grant any concessions on textile or agricultural subsidies to developing nations in the absence of an agreement over patent reform.<sup>71</sup>

To procure passage of TRIPS, IP producers settled on a political strategy of unilaterally punishing nations that would not adopt American patent standards to obtain bilateral resolutions that would then provide leverage against other developing nations in multilateral negotiations over TRIPS. In the pursuit of that strategy, they took advantage of some existing institutional mechanisms. The Trade Act of 1974 (Pub. L. 93-618), for example, is best known in scholarly literature for creating "fast track" authority which empowers the President to negotiate international trade agreements that Congress must consider without amendments or filibuster. But another provision, Section 301, required greater executive monitoring of and response to unfair trade practices and also gave American businesses the power to petition the office of the USTR to investigate such practices. Another provision created a new institution—the Advisory Committee for Trade Policy and Negotiation (ACTPN)—so that IP producers could have more direct and systematic input into the substance of U.S. trade policy.<sup>72</sup> President Carter appointed Pratt to the ACTPN in 1979, and Pratt became the Chairman in 1981.

IP producers also successfully lobbied for new laws and institutions that would increase their negotiating leverage. The first set of policy victories came with the International Trade and Investment Act (Title III of the Trade and Tariff Act of 1984, P.L. 98-573), which revised the Trade

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71. Ryan, *Knowledge Diplomacy: Global Competition and the Politics of Intellectual Property*, 106-11; Scherer, "The Political Economy of Patent Policy Reform in the United States," 204-06.

72. Ryan, *Knowledge Diplomacy: Global Competition and the Politics of Intellectual Property*, 68.

Act of 1974 to make the act of denying adequate patent protection a form of unfair trade practice against which the President had the authority to unilaterally retaliate.<sup>73</sup> Other provisions in the bill removed obstacles that the IP producers faced in asserting their patent rights abroad. The bill empowered the USTR to initiate its own investigations of inadequate foreign patent protection so that domestic firms did not have to formally file a petition and risk retaliation abroad. Another provision required the USTR to identify the most significant barriers to foreign investment, estimate the trade-distorting impact, and annually report the results of its investigations to Congress. The bill also gave the President the authority to enter into bilateral or multilateral trade agreements that would “obtain and preserve the maximum openness with respect to international trade and investment in high technology products and related services” (Section 305), and to consider the extent of patent protection when deciding whether to designate a country as a “beneficiary developing country” under the Generalized System of Preferences (Section 503).

Scrutiny of the provision linking patents to the Generalized System of Preferences (GSP) reveals the political tensions inherent in the emerging GKE. Starting in 1976, many developing countries came to rely on the GSP as it provided a non-reciprocal reduction in tariffs that made agricultural and manufactured goods produced abroad competitive in domestic markets. American financial interests supported the system because the foreign companies in which American banks had invested might struggle to repay their debts without preferential treatment.<sup>74</sup> IP producers realized that linking GSP access to global patent standards would provide leverage over developing nations as they could now make progress on tariff reductions in agricultural goods and textiles contingent upon the adoption of global patent standards. Section 503 did just that, and the United States began exercising its bilateral power under Section 503 almost immediately, moving first against Korea and

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73. Scherer, “The Political Economy of Patent Policy Reform in the United States.”

74. Stein, *Pivotal Decade: How the United States Traded Factories for Finance in the Seventies*, 95.

Brazil in 1985.<sup>75</sup> Far from being the stylized economy in which firms and nations freely develop comparative advantages based on factor prices, the GKE appeared to some as an economy in which wealthy nations dictated the terms and patterns of trade. At the same time, when the United States asserted itself under Section 503, it agreed to expose its own domestic growers and manufacturers to more competition, and even subsidize that competition, so long as IP producers could obtain stronger patent rights abroad.

The second set of policy victories came from various sections of the Omnibus Trade and Competitiveness Act of 1988 (P.L. 100-418). Parts of the 1988 Act escalated the USTR's investigation and reporting requirements and made it easier to retaliate against countries with inadequate IP protection.<sup>76</sup> The 1988 Act also amended the Tariff Act of 1930 to explicitly condone the practice of allowing patent holders to seek additional remedies, like an import ban, before the International Trade Commission (ITC). In a move emblematic of the new GKE politics, the law also loosened the "domestic industry" requirement for obtaining remedies in that forum. The ITC traditionally required petitioners to prove that they had a substantial domestic presence before initiating an action, which generally required "significant investment in plant or equipment" or "significant employment of labor or capital" within the United States. To further empower IP producers, the 1988 Act revised this requirement so that it could be met by showing "substantial investment" in the exploitation of a patent, "including engineering, research and development, or licensing" (P.L. 100-418 Section 1342). Petitioners before the ITC no longer needed to be firms that produced something or employed workers in the United States but could also be multinational companies that only developed new technologies in the United States. Small technical provisions like this one, buried in colossal omnibus bills, reveal how the AKE developed under the assumption that American national interests and the interests of IP producers were fully aligned. Institutions built

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75. Ryan, *Knowledge Diplomacy: Global Competition and the Politics of Intellectual Property*, 12-13,73-79.

76. Scherer, "The Political Economy of Patent Policy Reform in the United States," 203-4.

at the dawn of the twentieth century to respond to the needs of American manufacturers and industrial workers were adapted to respond to the needs of IP producers and investors, even if those interests were at odds with traditional manufacturing.

These institutional shifts enabled IP producers to exercise tremendous influence on the process of negotiating bilateral and multilateral trade agreements, which culminated in TRIPS. In fact, IP producers seemed to exert substantial influence during the negotiations for TRIPS itself. For example, when the USTR needed concrete evidence of the economics losses associated with “IP theft” to convince foreign negotiators that it was a problem, the agency solicited the IP producers’ perspective by entering a notice in the Federal Register which allowed IP lobbyists to formally provide commentary. IP producers and their interest groups participated, virtually alone, in this process and the claims embedded in their economic reports routinely became official statements. A revolving door also opened with former USTR negotiators joining the staffs of IP firms during the Uruguay Round of negotiations. The representatives of IP firms even joined official representatives of the U.S. government at the actual negotiating table, passing notes as the negotiations proceeded.<sup>77</sup> This is not to say that all members of the global IP producer coalition were always aligned. Significant divisions and tensions remained.<sup>78</sup> But IP producers overcame those differences to align behind a specific set of rules and institutions to govern the GKE and found U.S. government officials deeply receptive to their demands.

In sum, the AKE is situated within a GKE, the institutions of which multinational IP producers substantially shaped. Their goal was both to accelerate global integration so that they could minimize costs by locating the production of goods and commodities abroad while maximizing the global rents they could extract from their IP rights—even if that meant the U.S. government would

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77. Peter Drahos and John Braithwaite, *Information Feudalism: Who Owns the Knowledge Economy?* (The New Press: New York, 2003), 94-98,141.

78. *Ibid.*, 119.

have to actively subsidize competition against growers and manufacturers at home. They pursued that goal with singular focus over the course of 14 years, and while TRIPS represents the culmination of this effort, many smaller institutional reforms that IP producers lobbied for throughout the 1980s ultimately made TRIPS possible. The story of these developments is difficult to square with a theory which suggests middle-class voters are decisive in demanding pro-competitive policies, as few voters (indeed, few close political observers) were even aware of these developments, let alone championing them. And the policies demanded did not seek to promote competition across the global economy. They instead sought to expose “smokestack industries” to intense competition while dramatically expanding the monopolistic position of those firms that could produce new and valuable IP. Rather, the story of these developments conforms much more closely with the view that, because the emerging AKE was organized around IP, IP producers found pro-business Republicans and pro-IP Democrats receptive to their policy demands, which enabled IP producers to achieve incredible success in domains of public policy that garnered little attention in the broader public.

## **4.2 The National Industrial Innovation Debate**

As Democrats embraced the AKE as a salve to the nation’s declining economic competitiveness, an important political debate unfolded about the role the federal government would play in the AKE transition. The industrial policy debate, as it came to be known, was sprawling and expansive. But the debate mostly revolved around the question of whether the United States should create centralized institutions for coordinating federal investments in scientific research and technological development, much like the Ministry of International Trade and Industry did in Japan.<sup>79</sup> It began during the Carter administration and reached its apex during President Reagan’s first term, but

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<sup>79</sup> Chalmers A. Johnson, *MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975* (Stanford University Press: Redwood City, 1982).

it fizzled out by 1984 when Walter Mondale decided that Reagan was more vulnerable on the question of fiscal policy in that year's presidential election. An ideological re-framing of the question as whether the United States should have an industrial policy enabled partisans to take sides but hobbled the overall debate. The question was not whether the United States should have an industrial policy. It already had one. One legacy of the AKS was a de-centralized industrial policy developed ad hoc by a plethora of executive agencies with different legislative mandates and responsibilities to different Congressional oversight committees. The real question was whether the federal government should try to coordinate those policies and investments to some politically consensual end. Confusion also arose as to whether industrial policy should be forward-looking, to facilitate AKE development, or backward-looking, to prevent industrial decline.<sup>80</sup>

Partly because of the confusion surrounding the industrial policy debate, the conventional historical narrative is that it ended without generating any policy consensus at the federal level, which left the federal government with the de-centralized architecture of the AKS and paved the way for entrepreneurial states to fill the policy void.<sup>81</sup> As suggested above, conservatives bristled against the prospect of an activist government "picking winners" in the marketplace while liberals, despite their passion, failed to produce a coherent vision of what industrial policy in the United States should look like. This perspective is accurate, but it omits an important area in which political consensus did develop and which became essential for the construction of the AKE: industrial *innovation* policy rooted in patent reform.

In early 1978, President Carter assembled an advisory committee of "approximately 500 private sector participants and 250 representatives from 28 federal agencies" to address the nation's productivity slump and to propose a package of industrial policy reforms that would help end the

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80. Graham, *Losing Time: The Industrial Policy Debate*.

81. *Ibid.*

recession.<sup>82</sup> The Advisory Committee on Industrial Innovation divided into a series of subcommittees to address a wide range of domestic policies, from trade and environmental policy to federal procurement, but it is the subcommittee on patent and information policy that would go on to chart the path of the AKE transition. IP producers and the service workers that support them were heavily represented on the subcommittee, as its membership included representatives from machine manufacturer Allis-Chalmers, drug maker Merck, defense contractor Itek, robotics company Unimation, camera technology company Eastman-Kodak, chemical company FMC, and oil company Phillips Petroleum along with eight others who were mostly prominent patent attorneys or lobbyists.

As with the other subcommittees, the patent subcommittee drew its membership largely from corporate managers and legal professionals though a separate public interest subcommittee commented on their final report, and a labor subcommittee submitted its own separate report. The public interest commentary is short and mostly unremarkable, but it opposed further attempts by industry to expropriate economic gains flowing from publicly funded research, and it opposed the practice of assigning all rights in inventions to IP producers with few if any royalty rights going to the actual inventors. The even briefer labor commentary agreed on these points but went further, calling for the use of compulsory licensing when patents have clear social benefits and for expansive federal investments in research and development that did not just meet military and aerospace needs but also supported innovations to address urban, environmental, and other social problems.

But it was the IP producers' final report, issued in 1979, that would go on to provide a prescient blueprint for AKE development in the divided government of the Reagan and Bush administrations,

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82. James Turner, "The Next Innovation Revolution: Laying the Groundwork for the United States," *Innovations: Technology, Governance, and Globalization*, 2006, accessed August 6, 2021, <https://www.mitpressjournals.org/doi/abs/10.1162/itgg.2006.1.2.123>.

when the House remained under Democratic control. The report made five major patent reform proposals, all of which would come to pass by 1994. First, it recommended the creation of a central court to hear patent appeals to eliminate jurisdictional conflicts, which Congress did when it created the Court of Appeals for the Federal Circuit in 1982. Second, it recommended that Congress give corporations exclusive rights in patents on publicly funded research, which Congress did when it passed the Bayh-Dole Act of 1980 and the Stevenson-Wydler Act of 1980. Third, it recommended that patent terms be extended when commercialization is delayed due to federal regulations, which mostly impacted drug companies that had to obtain FDA approval before they could go to market with a new patented drug. Congress did so in the context of a much broader overhaul of pharmaceutical patenting with the Hatch-Waxman Act of 1984. Fourth, it promoted a foreign policy that would encourage other nations to adopt American patent standards, which Congress and the USTR achieved with TRIPS. Fifth, it recommended that Congress clarify that emerging technologies like computer software and biotechnology could receive patent protection, which Congress did not do.<sup>83</sup> But the Supreme Court mostly resolved the question of biotechnology patenting in 1980 and its broader admonition that patent law protected “anything under the sun made by man” gave IP producers what they wanted.<sup>84</sup>

IP producers had another problem, though. Patents promote innovation at the risk of future anti-competitive conduct, and the AKS had emboldened antitrust officials to attack mergers involving the acquisition of patents and to police the ways in which corporations abused their patent rights under the doctrine of patent misuse. Towards the end of their report, IP producers recommended a host of measures to “keep the Department of Justice from inhibiting innovation”.<sup>85</sup> In retrospect,

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83. Advisory Committee on Industrial Innovation: The Industrial Advisory Subcommittee on Patent and Information Policy, *Report on Patent Policy*, technical report (Department of Commerce, 1979), 148-49.

84. *Diamond v. Chakrabarty*, 447 U.S. 303 (1980).

85. Advisory Committee on Industrial Innovation: The Industrial Advisory Subcommittee on Patent and Information Policy, *Report on Patent Policy*, 164.

their recommendations seem modest. They could not have foreseen that Reagan's commitment to market fundamentalism would all but eliminate antitrust scrutiny of mergers and acquisitions.<sup>86</sup> Nor could they have anticipated the rising influence of the Atari Democrats. DOJ officials in the Clinton administration made no attempt to roll back the lax merger guidelines from the Reagan era, but sought instead to clarify, for IP producers, that in the Department's perspective, patents do not confer market power and, even if such market power is established, the Department will not assume that such power violates the antitrust laws.<sup>87</sup>

To the end of developing the AKE, Congress joined in these efforts. With the National Cooperative Research Act of 1984, it eliminated antitrust liability for joint ventures engaged in research and development. With the Patent Misuse Reform Act (1988), it narrowed the acts that constitute patent misuse. And with the National Cooperative Research and Production Act (1993), it eliminated antitrust liability for joint ventures engaged not only in research and development but in manufacturing as well. As other scholars have noted, federal attitudes towards patents and antitrust policy seem to evolve over time in tandem.<sup>88</sup> But the law is not itself an agent that develops according to the internal logic of capitalist imperatives; it is an output of political processes. The Democratic turn towards the knowledge economy, simultaneous with the Republican turn towards the market, motivated and drove these parallel shifts in federal institutions of American political economy.<sup>89</sup>

Figure 2 further reinforces how dramatically Congressional attitudes towards patents and antitrust changed over the post-war period. It shows, for every year from 1945-2020, the share of

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86. Nicholas Short, "Antitrust Deregulation and the Politics of the American Knowledge Economy," Working Paper, December 2019, <https://scholar.harvard.edu/nickshort/publications/antitrust-deregulation-and-politics-american-knowledge-economy>.

87. *Antitrust Enforcement and Intellectual Property Rights*, technical report (U.S. Department of Justice and Federal Trade Commission, 1995), Section 1 <https://www.justice.gov/atr/archived-1995-antitrust-guidelines-licensing-intellectual-property>.

88. Hart, "Antitrust and Technological Innovation in the US: Ideas, Institutions, Decisions, and Impacts, 1890-2000"; Brett Christophers, *The Great Leveler: Capitalism and Competition in the Court of Law* (Harvard University Press: Cambridge and London, 2016).

89. Greta R. Krippner, *Capitalizing on Crisis: The Political Origins of the Rise of Finance* (Harvard University Press: Cambridge and London, 2011).

all Congressional hearings dealing with patent or IP issues (black line) and those dealing with antitrust issues (gray line). Consistent with existing scholarship on antitrust reform, the share of Congressional hearings dealing with antitrust issues rises significantly after 1945, peaks in the early 1980s, but then rapidly declines following President Reagan's decision to substantially narrow antitrust oversight.<sup>90</sup> From about 1945-1962, Congressional interest in patent reform is roughly correlated with its increasing concern over antitrust and market power. But after a series of hearings in 1961 and 1962 about monopolistic pricing by drug companies and making federal patent policy consistent across agencies, IP became decoupled from the Congressional interest in antitrust until the late 1970s. From that point through the middle of the 1990s, IP and patent reform issues began taking up more and more of the Congressional agenda and it has continued to do so since the 1990s, albeit more episodically. As the figure suggests, the period of AKE development, from 1980-1994, was characterized by declining interest in antitrust oversight and accelerating interest in IP reform. The politics and legal technicalities behind many of these bills is much more complex than the sketch above suggests, but these complex historical contingencies should not obfuscate the general trend, which was to strengthen patent laws and diminish antitrust enforcement to the benefit of IP producers. In the process, government officials abandoned most of the tools—institutional legacies of the AKS—that were meant to ensure some public quid pro quo in exchange for stronger patent rights and exclusive rights in publicly funded research and development. The Bayh-Dole Act, for example, gave universities the power to enter into exclusive licenses with IP producers only if the invention would be manufactured substantially in the United States. At the same time, Congress made it quite difficult if not impossible to police this command by exempting these arrangements from the Freedom of Information Act.<sup>91</sup> As a result, no one knows whether patents developed with

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90. Lina Khan, "The Ideological Roots of America's Market Power Problem," *The Yale Law Journal Forum* 127 (2018): 960-979; Stoller, *Goliath: The 100-Year War Between Monopoly Power and Democracy*.

91. Arti Rai and Bhaven Sampat, "Accountability in Patenting of Federally Funded Research," *Nature Biotechnology* 30, no. 10 (2012): 953-956.

public funds have only been licensed to IP producers that commit to domestic manufacturing. The early political consensus seemed to favor an AKE that would benefit American workers, but the interests of multinational IP producers remained protected by a lack of transparency.

The outpouring of patent reform legislation also altered the AKE's political dynamics. In the conventional way that new policies create new interest groups to support them,<sup>92</sup> the Bayh-Dole Act led to the creation of the Association of University Technology Managers, an interest group representing the patent licensing offices of universities. The AUTM has repeatedly blocked efforts to make patented technologies more broadly available for research and development.<sup>93</sup> Now that universities stand to benefit from the lucrative rents that patents can generate, they more readily align themselves, politically, with their corporate benefactors. In this fashion, many universities abandoned norms of openness and sharing and accepted norms of appropriation, contributing to the creation of the "market university."<sup>94</sup>

In some respects, the creation of the Federal Circuit was the most significant and politically interesting victory as it involved the controversial construction of a novel judicial institution that would not only move the nation from the AKS to the AKE but would also insulate those developments from political pressure. The period of Congressional activism in patent reform described above, from 1980 to 1994, is actually an anomaly and reflects the intense bi-partisan commitment to hastening the AKE transition. In most periods, most American patent law is made by courts, by federal judges resolving legal questions and disputes that arise under the patent laws. Patent law is therefore an area of law that lawyers can shape while avoiding the demands of coalition building and the multitude of veto points that obstruct federal policy reform. The

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92. Andrea Louise Campbell, *How Policies Make Citizens: Senior Political Activism and the American Welfare State* (Princeton University Press: Princeton and Oxford, 2003).

93. Nicholas Short, "The Political Economy of the Research Exemption in American Patent Law," *Fordham Intellectual Property, Media, and Entertainment Law Journal* 26 (2016): 573.

94. Elizabeth Popp Berman, *Creating the Market University: How Academic Science Became an Economic Engine* (Princeton University Press: Princeton / Oxford, 2012).

main problem that IP producers had with the federal judiciary was that patent lawsuits in federal district courts were, like most other cases involving federal law, being appealed to regional circuit courts and eight of the eleven circuit courts still viewed patents as monopolistic devices that should be treated with skepticism.<sup>95</sup> IP producers therefore wished to eliminate this institutional and ideological legacy of the AKS.

The solution the IP producers settled on was to create a special appellate court staffed with pro-patent lawyers that would hear appeals in patent cases from all the federal district courts. That is precisely what the Federal Courts Improvements Act of 1982 did. Its passage was by no means guaranteed. Personal accounts suggest two factors made a difference. First, Carter's industrial innovation review transformed the issue from a small technocratic debate about appellate reform pushed by bureaucrats within the Department of Justice to a central plank in the AKE platform. Second, the agency officials who had worked on the issue in the past organized corporate patent lawyers into a vocal interest group to overcome the opposition of trial lawyers. Of the 85 letters signed in support of the bill, 76 were signed by corporate patent counsel, and the companies that turned out in support of the Act represented three quarters of the nation's industrial product.<sup>96</sup>

Some of those who helped create the Court would end up serving on it. Pauline Newman, the corporate patent attorney for FMC who served on the patent subcommittee of Carter's industrial innovation review, was the first judge appointed to the Court in 1984. Randall Rader, counsel to the Senate Judiciary Committee that approved the Act, joined her on the bench in 1990. Even when lawyers with patent backgrounds remained a minority on the Court, they decided a strong majority of the Court's patent cases, and the Court's strong pro-patent perspective played some role in

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95. U.S. Congress, House, Committee on the Judiciary, *Court of Appeals for the Federal Circuit Act Of*, 1981 WL 404308, 97th Cong., 1st sess., 1981, H. Rep. 97-312; Rachel Sachs, "The New Model of Interest Group Representation in Patent Law," *Yale Journal of Law and Technology* 16 (2013): 344.

96. Daniel J. Meador, "Origin of the Federal Circuit: A Personal Account," *American University Law Review* 41 (1992): 581-620; Pauline Newman, "Origins of the Federal Circuit: The Role of Industry," *Federal Circuit Bar Journal* 11 (2002): 541-43; Scherer, "The Political Economy of Patent Policy Reform in the United States."

causing a flood of patent applications that were approved and held valid at much higher rates in judicial disputes.<sup>97</sup> Absent Supreme Court intervention, which is rare in patent cases, the Federal Circuit mostly dictates the substance of patent law. As an Article III Court it is staffed by judges who, after surviving Senate confirmation, receive lifetime tenure and remain relatively immune from politics.

The creation of the Court of Appeals for the Federal Circuit, and its staffing with pro-patent judges, emphasizes the prominent role of the judiciary in shaping American political economy, especially its role in defining the exact contours of the property rights that undergird the American form of capitalism.<sup>98</sup> Because AKE development was so tightly tethered to stronger IP rights, and because the AKS had institutionalized an ideological aversion to patent rights in the federal judiciary, Congress had to substantially alter the structure the federal judiciary to create a pro-patent haven that had the power to quickly reorient the legal basis of American capitalism.

The substantial body of patent reform legislation from 1980-1994, summarized in Table 2, belies the notion that the industrial innovation debate produced no consensus at the federal level.<sup>99</sup> True, the parts of the debate concerning reindustrialization and central planning were quickly dispatched during Reagan's presidency. When the headwinds favoring AKE development confronted a President who believed the state had a limited role to play in a capitalist society, it became clear that the AKS's opaque and decentralized structure for investing in science and technology would remain, as would the strong preference for investments that bolster national security.<sup>100</sup> Congress amended the Employee Retirement Income Security Act (ERISA) in 1979 to allow pension fund

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97. William M. Landes and Richard A. Posner, "An Empirical Analysis of the Patent Court," *University of Chicago Law Review* 71 (2004): 111-128.

98. Morton J. Horwitz, *The Transformation of American Law 1780-1860* (Harvard University Press: Cambridge and London, 1977); Stephen Skowronek, *Building a New American State: The Expansion of National Administrative Capabilities* (Cambridge University Press: New York, 1982); Christophers, *The Great Leveler: Capitalism and Competition in the Court of Law*; Kathleen Thelen, "American Business in Comparative Perspective: Historical Legacies and the Long Shadow of the Law" (Forthcoming, March 2021).

99. Graham, *Losing Time: The Industrial Policy Debate*.

100. Block, "Swimming Against the Current: The Rise of a Hidden Developmental State in the United States."

managers to invest as much as five percent of a fund in venture capital, which caused a massive surge in venture capital investment.<sup>101</sup> As noted above, the Small Business Innovation Research Act of 1982 essentially created a federal venture capital program administered by the Small Business Administration. The NSF began experimenting with university-industry research centers to draw together scientists from across multiple institutional settings. To help the semiconductor industry better compete against Japanese firms, the Reagan administration established a research consortium (SEMATECH) in Austin, Texas in 1987. Starting in 1988, an Advanced Technology Program and a Manufacturing Extension Partnership, both administered by the National Institute of Standards and Technology, provided federal matching grants for promising new technologies and used experts to help manufacturers make use of advanced technologies.<sup>102</sup> These and other policies tried to fill gaps in the AKS's system of technological production, promote collaboration and the public-private partnerships that were so central to the Atari Democrat's neoliberal vision, and shore up declining industries that impacted national security. They are extensions of the AKS into the modern era.

But within the constraints of divided government, a strong bi-partisan consensus also developed in favor of industrial innovation policies that would be achieved instead through market-oriented devices like patent reform, and that movement altered central institutions of American political economy to hasten AKE development. Table 2 reveals the strong bi-partisan majorities that aligned behind the most significant reforms. For each major piece of patent reform legislation, the table shows the vote on each major House action (usually a vote to pass or a vote to adopt a Senate version), but it also shows comparable votes for more controversial non-patent legislation in similar time frames (rows with gray backgrounds). For example, in the 96th Congress, when Democrats held 276 seats, the Bayh-Dole and Stevenson-Wydler Acts both breezed through the House by voice

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101. Eisinger, *The Rise of the Entrepreneurial State: State and Local Development Policy in the United States*; William Lazonick and Mariana Mazzucato, "The Risk-Reward Nexus in the Innovation-Inequality Relationship: Who Takes the Risks? Who Gets the Rewards?," *Industrial and Corporate Change* 22, no. 4 (2013): 1093–1128.

102. Block, "Innovation and the Invisible Hand of Government."

vote on suspension with at least a two-thirds majority (290 votes in favor), but a bill to centralize and coordinate federal education programs in a new Department of Education only narrowly survived with 215 votes. Then, in the 98th Congress, when Democrats held 269 seats, three major patent reform initiatives passed by large margins (366, 418, and 368 votes in favor), but a more controversial bill to revise social security financing passed much more narrowly on party lines (284 votes in favor). Many of the Atari Democrats' more ambitious proposals for the AKE foundered in this same time frame. But when they focused on IP rights as a tool for facilitating AKE development, they were able to build commanding bi-partisan majorities. And their successes, in this regard, belie the notion the industrial policy debate produced no meaningful federal action.

### **4.3 The Entrepreneurial States**

As the federal debate on industrial policy consolidated around patent reform, entrepreneurial states (and cities) began to address federal policy shortcomings. The move came with a dramatic shift in the way state and local officials conceived of economic development. State and local governments have always played a prominent role in managing economic affairs, but in the days of the AKS, most governors engaged in zero-sum attempts to lure footloose firms away from other states with the promise of special tax incentives and cheap labor. As the nation reoriented its economic priorities and moved towards the AKE, state and local representatives began to align behind a different consensus. State officials began to perceive wage stagnation less as an advantage and more as a sign of economic decline; they focused less on using capital subsidies and cheap labor to steal low-paying jobs from other states and more on incubating new businesses and industries that could export products to other states and even to other nations.<sup>103</sup>

The movement caught on fast, and by the middle of the 1980s the vast majority of states had

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103. Eisinger, *The Rise of the Entrepreneurial State: State and Local Development Policy in the United States*, Chs. 1-4.

designed policies to hasten their integration into the AKE despite, and in the face of, growing budget shortfalls. By 1986, at least 25 states had adopted some form of venture capital program providing a state equivalent to the federal programs administered through the Small Business Administration, and some developed novel techniques like earmarking portions of public employee retirement funds for local venture capital investment.<sup>104</sup> By 1984, 34 states had sponsored some form of high-technology development program and 44 states had adopted some form of university-industry research center comparable to the federal innovation centers sponsored by the NSF to promote technology transfer.<sup>105</sup> In the 1970s governors mostly traveled abroad to lure foreign capital into their states; by 1984, states spent two thirds of their trade-related expenditures on promoting exports in a manner similar to the federal Export-Import Bank.<sup>106</sup>

The institutional similarity between these programs and their federal equivalents can obscure their very different motivations: entrepreneurial states tended to adopt knowledge economy policies to redress the severe imbalances of the AKE. State venture capital pools were partly used to remedy the extreme geographic concentration in private venture capital. State sponsored university-industry collaborations were often meant to correct the heavy defense orientation of federal efforts. State export promotion focused on smaller firms that often did not receive assistance from the Export-Import Bank. Though the entrepreneurial political leaders for the states turned to the same policy tools that sculpted the decentralized federal system of investment, they used those tools to achieve local purposes and soften the blow of a federal policy that benefited regions already rich in AKE infrastructure, multinational firms, and defense contractors.

The importance of entrepreneurial states in AKE development is also reflected in the prominent role of state governors in defining the Democratic Party's turn towards the AKE. In fact, in some ways,

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104. Eisinger, *The Rise of the Entrepreneurial State: State and Local Development Policy in the United States*, 249-65.

105. *Ibid.*, 275-89.

106. *Ibid.*, 294.

the Party's evolving commitments to the AKE can be told through the presidential aspirations of three governors: California's Jerry Brown, Massachusetts' Michael Dukakis, and Arkansas' Bill Clinton.

Brown's attempts at winning the presidential nomination in 1976 and 1980 would spectacularly fail, but as Governor of California Brown led the way in articulating the Democratic vision for AKE development. As the debate over industrial policy that began under the Carter administration devolved into a debate over patent reform during the Reagan administration, Brown inaugurated his own Commission on Industrial Innovation and appointed prominent IP producers like Steve Jobs and David Packard and marketing expert Regis McKenna to serve on it. The Commission's final report, issued in September of 1982, called for a fully developed industrial policy that would revitalize existing industries like steel, ensure the competitiveness of new industries like semiconductors, and counter the industrial policies of nations like Germany and Japan. Where conservatives maligned industrial policy as "picking winners," Brown's commission wore that accusation as a badge of honor. To accomplish its goals, the Commission claimed, "we need a national strategy designed to encourage the spread of 'winning technologies'... throughout our entire industrial structure".<sup>107</sup>

Where Brown failed to attain the Democratic nomination, Dukakis eventually succeeded and, in some respects, his career better represents the shifting politics of the Atari Democrat movement. Like other Atari Democrats, Dukakis won his first gubernatorial election in 1974 by distancing himself from the urban, ethnic old guard of the Massachusetts Democratic Party and echoing George McGovern's message of liberating technological development from its dependency upon the Pentagon. Dukakis then lost to Edward King in 1978 after IP producers, organized as the Massachusetts High Technology Council (MHTC), campaigned against him on the issue of limiting

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107. Executive Advisory Council, *Winning Technologies: A New Industrial Strategy for California and the Nation*, technical report (California Commission on Industrial Innovation, 1982).

property taxes. But Dukakis then mended his relationship with the MHTC—which did not have a single unionized company among its more than one hundred members—during his time out of office and, after cultivating ties with economic advisers at MIT and Harvard like Lester Thurow and Robert Reich, he came back to victory in 1982. During his second term, Dukakis sought to turn Massachusetts into the “very model of the high tech state”,<sup>108</sup> and the period of economic revitalization that he presided over from 1982 to 1988 came to be known as “the Massachusetts Miracle.”

Whether any of Dukakis’ policies actually played a role in producing the perceived miracle is uncertain. The state’s economic revitalization may have had more to do with the fact that President Reagan dramatically increased defense spending while slashing federal support for state governments under the auspices of the “new federalism,” a combination of policies that limited fiscal support for conventional state industrial policy while also bestowing federal largesse in defense heavy states like California and Massachusetts.<sup>109</sup> In 1985, Raytheon alone received \$2.3 billion in defense contracts<sup>110</sup> and aggregate defense production came to roughly \$12 billion or 8.3 percent of Massachusetts’ net product,<sup>111</sup> in the same year, the state’s entire general operating fund came to only \$5.6 billion.<sup>112</sup> The Pentagon’s central role has led some to argue that the economic turnaround is not that miraculous and to characterize the governor’s role in it as minor.<sup>113</sup> Dukakis claimed political credit, nevertheless. And in doing so, he tied his own political career and the future of the Democratic party to both the broader goal of AKE development and the specific policies that characterized his tenure, like more conservative forms of welfare reform combined

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108. Geismer, *Don’t Blame Us: Suburban Liberals and the Transformation of the Democratic Party*, 268.

109. Eisinger, *The Rise of the Entrepreneurial State: State and Local Development Policy in the United States*, 67-69.

110. Geismer, *Don’t Blame Us: Suburban Liberals and the Transformation of the Democratic Party*, 270.

111. David Lampe, “Introduction,” in *The Massachusetts Miracle: High Technology and Economic Revitalization*, ed. David Lampe (The MIT Press: Cambridge and London, 1988), 11.

112. United States Census Bureau, *Statistical Abstract of the United States*, technical report (The United States Government, 1985), 278.

113. Lampe, “Introduction,” 16.

with “public-private” partnerships to promote startup formation.

Clinton ultimately succeeded where both Brown and Dukakis failed, and he did so in an election cycle in which knowledge economy politics dominated. To prevail in the Democratic primary, Clinton had to defeat both Brown and Paul Tsongas, the Atari Democrat whose district included the town of Lowell, home to the prominent computing company, Wang Laboratories. Clinton then had to compete in the general election against an incumbent Republican president and a third-party candidate, H. Ross Perot, who founded Electronic Data Systems and effectively created the industry of information technology outsourcing. In a field crowded with politicians giving voice to the demands of technology entrepreneurs, Clinton prevailed by carefully cultivating relationships with California’s Silicon Valley and naming technology wonk, Al Gore, to be both his running mate and his technology czar. Clinton also astutely distanced himself from the “Massachusetts liberal,” Dukakis, while embracing virtually all of Dukakis’ governing agenda.<sup>114</sup> Clinton’s calculus paid dividends. He ultimately won the public endorsement of Xerox CEO, Paul Allaire, Apple CEO, John Sculley, Hewlett-Packard CEO, John Young, and twenty-nine other IP executives.<sup>115</sup>

Young’s endorsement of Clinton in the 1992 race illustrates the key political shift that took place between 1980 and 1992. Throughout the 1980s, as Democrats began to articulate their allegiance to the AKE, business managers for IP producers largely remained aligned with Reagan and Bush.<sup>116</sup> But the Reagan era also widened political cleavages among these executives in a way that precipitated Young’s conversion. When Jerry Brown released his blueprint for national industrial policy in September of 1982, Reagan grew angry at the idea of Democrats claiming the mantle of entrepreneurship and started his own Commission on Industrial Competitiveness, which Young chaired.<sup>117</sup> The Commission released its report in January of 1985. It painted a bleak picture of

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114. Geismer, *Don’t Blame Us: Suburban Liberals and the Transformation of the Democratic Party*, 278-79.

115. Margaret O’Mara, *The Code: Silicon Valley and the Remaking of America* (Penguin Books, 2019), 292-96.

116. *Ibid.*, 192-95.

117. *Ibid.*, 213-15.

declining American competitiveness by almost any chosen metric and recommended policies that looked like industrial policy rebranded as “competitiveness strategy.” Reagan ignored the report in its entirety despite a joint resolution demanding a presidential response supported by 30 senators in each party.<sup>118</sup> Reagan abhorred the idea of industrial policy and pursued AKE development mostly through broad untargeted tax cuts intended to promote investment coupled with massive increases in defense spending. If Japan had MITI, the US would have DARPA.<sup>119</sup> Young and the other executives that endorsed Clinton in 1992 believed that the federal government would have to do much more to resolve the competitiveness crisis, and Clinton quite effectively gave voice to those demands.

The institutional shifts that demarcate the transition from the AKS to the AKE are summarized in Table 1. Though most of these changes took place at the national and global level, political leaders at the state level also played a role in shifting strategies for economic development from the zero-sum devices of the AKS to the innovation-oriented devices of the AKE, and they did so in ways that met local needs and rectified imbalances in the federal framework. And because demonstrated state leadership in facilitating AKE development increasingly became a strong political asset, state leaders—in their attempts at the presidency—played a substantial role in articulating the Democratic Party’s relationship to the AKE. Ironically, the Governor of Arkansas, not California or Massachusetts, would become the defining Democratic spokesperson for the AKE. He achieved that victory in part because the industrial policy debate widened political cleavages among technology executives and elected officials during the Reagan and Bush administrations. For those who viewed the Semiconductor Industry Association lobbying for SEMATECH as a handout to “California Crybabies” the future lay with Bush. For those, like John Young, who saw research consortia like SEMATECH as exemplary federal policy, the future lay with Clinton.

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118. Graham, *Losing Time: The Industrial Policy Debate*, 168-69, 220.

119. O’Mara, *The Code: Silicon Valley and the Remaking of America*, 223-26.

## 5 Conclusion

The American knowledge economy is not a foreordained product of globalization or automation or technological development. Nor is it a natural form of political economy that attains when the economic beneficiaries of those outcomes, namely highly educated workers, formulate and express political demands. It is instead a politically generated consensus for producing economic prosperity and economic advantage against other nations in which intellectual property, and the businesses that produce it, play a leading role. As is true in many other domains of American political development, policy entrepreneurs and organized interest groups, not rational voters, played the most important role in reconfiguring essential institutions to facilitate the transformation. In the actual story of AKE development, Atari Democrats and IP producers, not decisive middle-class voters, had the most enduring legacy.

Intellectual property in general, and patents in specific, are at the center of the AKE, but are by no means the whole story. The AKE relies, for example, on a massive, decentralized infrastructure for investing in scientific and technological development as well as the commercialization of new technologies. But that infrastructure is a legacy of the AKS and as such it does not distinguish the AKE, institutionally, from what came before. Similarly, American businesses can acquire substantial market power through devices other than patents (first-mover effects, network effects, control of internet user information, etc.). But these forms of acquiring market power were never at the heart of the political consensus behind the AKE, even if that consensus accepted rent-seeking by technology firms as an acceptable price to pay for increasing the nation's competitive position. Only when we focus on that consensus, and on the institutional changes it produced, does it become clear that the AKE is unique in its dependence on IP as a source of generating economic advantages for American businesses and for the nation.

Plenty happened after 1994, the end of the period discussed in this article, that contributed to AKE development. But those events are mostly contemporary manifestations of dynamic processes that were unleashed in the formative period of AKE development, from 1980 to 1994, when Congress erected the AKE's institutional architecture. New programs were added to the alphabet soup of federal initiatives and TRIPS gave way to TRIPS+ and then the Trans-Pacific Partnership, but these are natural extensions of what happened before. The Democratic Party deepened its commitments to the AKE under Presidents Clinton and Obama and continued to encounter intense conservative opposition only when it imagined a major role for the state other than addressing national security imperatives. The Democratic Party continued to ignore the social and political ramifications of allowing their chosen national champions to acquire unprecedented market power, and now faces escalating demands to restore the Brandeisian tradition of robust antitrust enforcement.<sup>120</sup> And, because the narrow neoliberal vision of the AKE that emerged between 1980 and 1994 inherently exacerbates many forms of existing inequality, growing factions within the Party are questioning whether social democracy or some other form for arranging the American political economy would better serve the national interest.<sup>121</sup> These and other contemporary controversies arguably have roots in the political choices made during the AKE's formative period, and their resolution may depend on more direct confrontation with the limits of the Democratic vision for the AKE that emerged in that era.

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120. Khan, "The Ideological Roots of America's Market Power Problem"; Stoller, *Goliath: The 100-Year War Between Monopoly Power and Democracy*.

121. Nicholas Short, "The Distributional Consequences of the American Knowledge Economy" (Working Paper, April 2021).

## 6 Tables

Table 1: **The AKS and AKE Differ Mostly in their Approach to IP**

Institution	American Knowledge Society (1945-1979)	American Knowledge Economy (1980 - present)
Macroeconomic management	Political consensus: diplomatic Keynesianism relying heavily on R&D tax credits while ignoring interventionist strategies abroad for the sake of post-war reconstruction	Political divisions: market fundamentalism (R) or Schumpeterianism (D)
Norms amongst public innovators	Openness and sharing	Appropriation and rent extraction
Federal agencies	Heavily decentralized approach to investing in scientific and technological development	Heavily decentralized approach to investing in scientific and technological development
Core policy motivation	National security	National security and comparative economic advantage
Antitrust oversight	Aggressive enforcement against IP producers and deep concern about market power flowing from patents; frequent use of compulsory patent licensing	Little if any enforcement against IP producers and diminished concern about market power; no use of compulsory licensing
Judiciary	Patent cases treated like any other federal case; many circuit court justices skeptical of patents	Appeals in patent cases handled in specialized court committed to strengthening patent rights
Common law	Legal constraints on patent power, like research exemptions and patent misuse liability, ensure patents promote public interest	Legal constraints on patent power narrowed or eliminated
Global and domestic trade institutions	Global IP issues handled by UN where one-nation, one-vote procedures give developing nations substantial power; substantial "domestic industry" (people or plant) required for those who seek remedies before ITC	Global IP issues handled by WTO where link to tariffs increase IP producer leverage and diminish developing nation power; investments in research or IP licensing considered sufficient ties to US to permit remedies before ITC
Dominant strategy at state level	Zero-sum devices using weak labor laws or special tax advantages to lure jobs from one region into another	Cultivating local innovation hubs through venture capital and university-industry research consortia

*Note:*

This table shows the main differences and similarities between the political institutions and policies that shaped innovation during the Fordist period, which I refer to as the American Knowledge Society (AKS), and those that shaped and continue to shape the American Knowledge Economy (AKE) of today.

Table 2: IP Reform Had Deep Bi-Partisan Support

Cong.	Public Law Number	Public Law Title	Main Purpose(s)	Relevant House Actions	Vote (Aye-Nay)
96	PL96-517 (94 Stat. 3018)	Patent and Trademark Laws, amendments (Bayh-Dole)	Give industry the right to obtain exclusive licenses on university patents	Nov. 17, 1980 passed HR6933 by voice vote on suspension (Cong. Rec. 29890-901); Nov. 21, 1980 concurred in Senate amendment by voice vote (Cong. Rec. 30556-60)	>289 aye; >289 aye
96	PL96-480 (94 Stat. 2311)	Stevenson-Wydler Technology Innovation Act of 1980	Give industry the right to obtain exclusive licenses on federal agency patents	Sep. 8, 1980 amended S.1250 by voice vote on suspension (Cong. Rec. 24560-68); Oct. 1, 1980 receded from House amendments and concurred in Senate amendments by voice vote (Cong. Rec. 28578)	> 289 aye; >289 aye
96	PL96-88 (93 Stat. 668)	Dept. of Education Organization Act	Centralize and coordinate federal education programs across the agencies	July 11, 1979 passed HR2444 by roll call; Sep. 27, 1979 vacated HR2444 and passed S210 by roll call	215-211; 220-205
97	PL97-164 (96 Stat. 25)	Federal Courts Improvement Act of 1982	Create a centralized appellate authority on patent law	Nov. 18, 1981 passed HR4482 by roll call	323-77

98	PL98-417 (98 Stat. 1585)	Drug Price Competition and Patent Restoration Act of 1984 (Hatch-Waxman)	Extend period of patent protection to account for regulatory review; simplify approval process for generic drugs	Sep. 6, 1984 passed HR3605 by roll call	366-0
98	PL98-462 (98 Stat. 1815)	National Cooperative Research Act of 1984	Remove antitrust liability for joint ventures engaged in research and development	May 1, 1984 passed HR5041 by roll call	418-0
98	PL98-573 (98 Stat. 2948)	Trade and Tariff Act of 1984 (Title III is The International Trade and Investment Act)	Establish unilateral authority under Section 301 of the Trade Act of 1974 to sanction nations without adequate IP protection	June 28, 1983 passed HR3398 by roll call; Oct. 9, 1984 agreed to conference report by roll call	368-43; 386-1
98	PL98-21 (97 Stat. 65)	Social Security Amendments Act of 1983	Revise social security system of financing to assure solvency	March 9, 1983 passed HR 1900 by roll call	284-149
100	PL100-418 (102 Stat. 1107)	Omnibus Trade and Competitiveness Act of 1988	Require USTR monitoring and investigations under Section 301; weaken the domestic industry requirement in ITC proceedings involving patents	July 13, 1984 passed HR4848 by roll call	376-45

100	PL100-703 (102 Stat. 4674)	Patent and Trademark Office Authorizations (Title II is the Patent Misuse Reform Act)	Narrow the acts that constitute patent misuse; make the doctrine an extension of antitrust law and not a tool for enforcing general principles of patent policy	Oct. 5, 1988 passed HR4972 by voice vote on suspension (Cong. Rec. 28593-95); Oct. 20, 1988 concurred in Senate amendments by voice vote on suspension (Cong. Rec. 32293-96)	>289 aye; >289 aye
101	PL101-580 (104 Stat. 2683)	Inventions in Outer Space	Extend U.S. patent laws to inventions made in space	Oct. 26, 1990 passed S459 by voice vote on suspension (Cong. Rec. 35117-19)	>289 aye
101	PL101-649 (104 Stat. 4978)	Immigration Act of 1990	Change the level and preference system for immigrant admissions	Oct. 3, 1990 passed HR4300 by roll call; Oct. 27, 1990 adopted conference report on S358 by roll call	231-193; 265-119
102	PL102-560 (106 Stat. 4230)	Patent and Plant Variety Protection Remedy Clarification Act	Negate state sovereign immunity from liability for patent infringement (later declared unconstitutional)	Oct. 3, 1992 passed S758 by voice vote on suspension (Cong. Rec. 31182-83)	>289 aye
103	PL103-42 (107 Stat. 117)	National Cooperative Production Amendments of 1993	Remove antitrust liability for joint ventures engaged not only in research and development, but in manufacturing as well	May 18, 1993 passed HR1313 by voice vote on suspension (Cong. Rec. 10094-99)	>289 aye

103	PL103-465 (108 Stat. 4809)	Uruguay Round Agreements Act	Make acceptance of American patent standards a precondition for joining the World Trade Organization (TRIPS)	Nov. 29, 1994 passed HR5110 by roll call	289-145
103	PL103-31 (107 Stat. 77)	National Voter Registration Act of 1993	Establish voter registration by mail or at driver's license application for states that do not allow same day registration	Feb. 4, 1993 passed HR2 by roll call; May 5, 1993 adopted conference report on HR2 by roll call	260-160; 260-164

*Note:*

This table shows the Congress number, public law number and title, and main purpose of major patent reform legislation (rows with white background) and, for comparison, some more partisan bills from the same time period (rows with gray background). The table includes the relevant actions in the House of Representative (with parenthetical citations to the Congressional Record) and the House roll call vote where available. Bills passed by voice vote on suspension require a two-thirds majority (or 290) to pass.

## 7 Figures

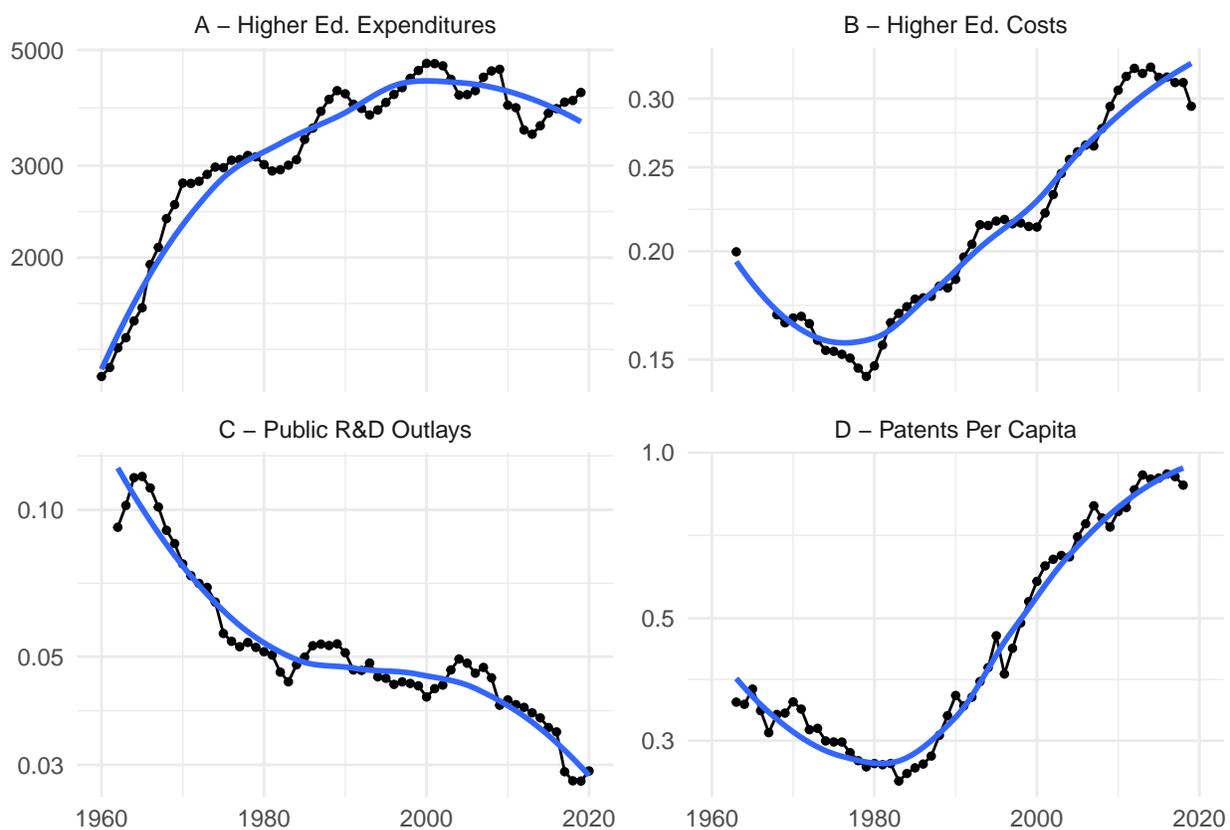


Figure 1: Each panel in this figure displays a time series showing how various economic indicators evolved between 1960 and 2020. Panel A shows total state tax appropriations for higher education at the state level, in 2019 dollars, per collage age adult (18-24). Panel B shows the average undergraduate tuition and fees paid to degree granting institutions as a percentage of the national median family income. Panel C shows federal outlays for research and development as a share of the total budget. Panel D shows the annual number of utility patents of U.S. origin applied for on a per capita basis (patents per thousand people). The vertical axes in all plots is displayed on the log scale to make it easier to visualize changes within periods. The blue line in each plot is a smoothed representation of the data that enables better visualization of the underlying trends. Higher education expenditures come from annual Grapevine reports housed by the College of Education at Illinois State University. Data on the population (both the collage age population and total population) and the median family income comes from the Federal Reserve Bank of St. Louis. Data on undergraduate education costs comes from the 2020 Digest of Education Statistics housed by the National Center for Education Statistics, Table 330.10. Data on federal research and development outlays comes from the Historical Trends in Federal R&D datasets maintained by the American Association for the Advancement of Science. Annual patent data comes from the U.S. Patent Statistics Chart of the U.S. Patent and Trademark Office.

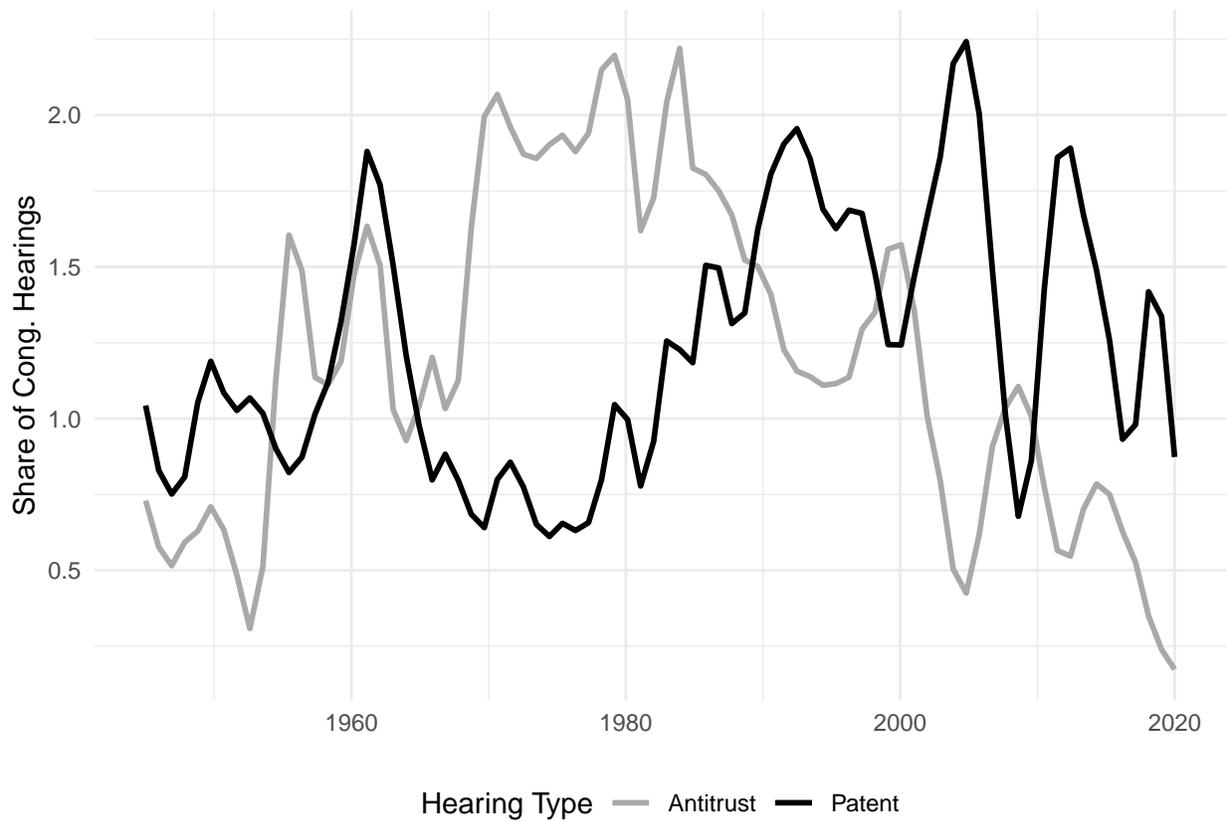


Figure 2: This time series shows the share of all Congressional hearings that involved patent (black line) or antitrust (gray line) issues. Data on hearings comes from ProQuest Congressional. Antitrust hearings include any hearing that contained the terms ‘antitrust’ or ‘anti-trust’ in the hearing description; patent hearings include any hearing that contained the terms ‘patent’ or ‘intellectual property’ but not ‘land’ in the hearing description (land grants were historically referred to as land patents). The curves have been smoothed to avoid overplotting.

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