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. It is instead a politically generated consensus for producing economic prosperity in which intellectual property, and the businesses that produce it, play a leading role. The history of AKE development reveals as much and also shows that, while the legal regimes governing the AKE achieved bipartisan consensus, the AKE would not have emerged without a fundamental realignment within the Democratic Party. The history also shows that the AKE has severe distributional consequences and recent empirical work reinforces the view that the AKE is an engine of geographic, economic, and political inequality.

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1 Introduction

In some ways, the COVID pandemic has laid bare certain paradoxes about the American political economy. On the one hand, the nation recorded its steepest decline in economic output on record in the second quarter of 2020 as more than 50 million people remained unemployed despite trillions of dollars of new federal expenditures and monetary expansion. On the other hand, the nation’s technology firms shook off initial losses and roared to new unprecedented valuations. The electric car manufacturer, Tesla, to take but one example, saw its stock price decline from about 900 dollars per share to 360, before exploding to over 2,200 dollars per share in August. Similarly, the summer season of initial public offerings, in the midst of the pandemic, was so strong that a wave of new offerings involving some of the biggest private companies on the planet, most of them technology firms, began as Labor Day approached.

The paradox of technology firms doubling their market valuation in the middle of an economic shutdown has surprised scholars and market analysts alike. But in some respects, it is a conventional story of knowledge economy development, the history of which is conveyed in this article. Starting in the early 1970s, both political parties struggled to define strategies for producing economic prosperity and reversing that decade’s economic malaise after it became clear that standard Keynesian tools of macroeconomic management would not do so. The Republican Party experimented with monetarism to deal with inflation but quickly settled on a longer-term strategy of tax cuts financed by foreign borrowing combined with economic deregulation and global integration. The Democratic Party struggled to articulate an alternative at first, but eventually embraced the idea of the American knowledge economy (AKE), a globally integrated economy in which the American producers of lucrative new technologies—commodified as intellectual property—would capture substantial market power and improve the nation’s competitive position.

The current moment is in some ways a logical outcome of those political debates, which unfolded between 1972 and 1994. The producers of new technologies have in fact captured substantial market power and the nation’s economic competitiveness is heavily dependent on their success. Though Tesla sells only 4 percent as many cars as Ford and General Motors, it recently exceeded 400 billion dollars in market capitalization, more than five times the combined market value of Ford and GM. Tesla is therefore a fitting symbol of the hypothesized transition from a Fordist economy rooted in manufacturing commodities to a knowledge economy rooted in the production of ideas and new technologies (Bell, 1974).

But Tesla’s business strategy and its success in the face of economic crisis also allude to much deeper tensions within the AKE. Some of the speculation about Tesla’s market value relates to the company’s new gigafactory in Shanghai and its demonstrated ability to produce and deliver its highly regarded vehicles to relatively affluent consumers in the United States and China once the pandemic subsides. Tesla’s ability to generate profit therefore seems somewhat untethered to the economic futures of those domestic workers and consumers that the pandemic has hit the hardest, many of whom will struggle to afford the company’s least expensive offering even after it becomes safe to return to work. At the same time, some of the speculation about Tesla’s value is rooted in the belief that all of Tesla’s competitors are years behind in developing comparable battery technologies so that the company is well positioned to capture what its funders call the “full stack.” In this view, Tesla is positioned to capture substantial market power in the future not just because it has superior battery technology, but also because it has cutting edge self-driving software, because it owns a network of exceptionally fast super-charging stations, because it is well positioned to offer data-driven auto insurance across the country, and because it may even leverage
its battery technology to revolutionize residential solar power infrastructure. And its prospects for
future development are abetted by substantial amounts of intellectual property: a quick web search
suggests that Tesla had more than 600 US patents and 68 Chinese patents as of late August.

The history of AKE development that I recount below, for which Tesla is a parable, is based on
several core contentions. First and foremost, the AKE is not about the production of knowledge per
se—which was equally important during the Fordist era and the Cold War—but is instead about the
production of intellectual property (IP). Political 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. Second, the AKE should not be understood as a
foreordained outcome of uncontrollable economic forces, but as a politically constructed strategy
for increasing the nation’s economic competitiveness. While both political parties played a part
in generating that consensus, the Democratic Party emerged as its most forceful advocate. In
fact, the AKE arguably would not have developed in the same fashion if the Democratic Party
had not transformed itself by elevating the demands of suburban post-industrial professionals
over the demands of its industrial blue-collar base. Third, the AKE is situated within a global
knowledge economy that American IP producers substantially shaped which marries incentives for
the domestic production of IP with incentives for the foreign production of commodities. The AKE
is, in this sense, deeply wedded to broader political movements for global economic and financial
integration. Fourth, because the AKE revolves around the production of IP, IP producers and the
legal and financial professionals on whom they intensely depend are the key political actors in the
story of AKE development. Finally, a growing body of scholarship contends that the rent-seeking
inherent to the AKE produces substantial geographic, economic, and political inequalities which
suggests that the political consensus supporting the AKE has severe distributional consequences
that political representatives have so far failed to confront.

Political analysis of the AKE unfortunately remains scant. As the nation accelerates its AKE
transition, political scholars have yet to offer many insights about the political behavior of IP
producers, the tradeoffs inherent in knowledge economy policies, or the relationship between
the AKE and the main political parties. Important new works include those investigating the
AKE’s role in producing the urban-rural divide in partisanship (Rodden, 2019), those exploring the
political behavior of technology entrepreneurs (Broockman, Ferenstein, and Malhotra, 2019), and
those exploring the relationship of the AKE to the broader study of American political economy in
comparative perspective (Hacker et al., 2019). This article is meant to supplement these studies
by exploring more foundational questions about how we should the define the AKE and how we
should understand the policies that created it and the politics that sustains it.

The argument is organized as follows. In Section 2, I argue that the transitions-based definition
of the AKE following Bell (1974) obscures the politics behind AKE development and misleadingly
suggests that knowledge economies are organized to produce abstract knowledge rather than
IP. In Section 3, I describe the post-war consensus on macroeconomic policy and technological
development that made up the period prior to the AKE, which I will refer to as the American
knowledge society (AKS). In Section 4, I offer a synthesis of a largely historical literature that relates
the history of AKE development within three distinct geographies: the AKE is mostly a product of
national politics but is situated within a global knowledge economy from above and is abutted
by entrepreneurial states from below. I offer this synthesis not only to convey the history of AKE
development but to identify the role played by interest groups and political parties and connect
the history to various bodies of literature in political science and political economy. In Section 5, I
argue that the AKE’s reliance on IP inherently creates an economy organized around rent-seeking and produces inequality of many different forms.

2 Characterizing Knowledge Economies

When most scholars invoke the concept of the knowledge economy, they are referring to an economic transition or transformation, much like the prior transition from agriculture to manufacturing, that unfolded in the United States starting around 1970. The knowledge economy, in this transitions-based perspective, either has uncertain origins or evolves naturally from global economic imperatives, but it produces concrete economic symptoms that allow for diagnosis. Those symptoms include a decline in employment and wages accruing to blue-collar workers and an increase in employment and wages accruing to professionals with advanced degrees offering services (inventive, legal, financial) that the new economic order demands. Daniel Bell’s widely invoked definition of the post-industrial society (Bell, 1974, pp.12-33) largely follows these contours.

The transitions-based perspective on the AKE has several shortcomings. One problem is that it implicitly embraces the view that the American economy is a product of uncontrollable forces and ignores a pivotal finding in comparative political economy: that modes of economic production are politically negotiated so that varying national politics can generate different varieties of capitalism, whether industrial or post-industrial (Hall and Soskice, 2001). Put simply, the AKE is thought of as something that happened to us rather than something that we created. Such a perspective gives no agency to the political and economic interests that shaped the AKE and makes it difficult to approach the AKE as an object worthy of political study. Another problem is that the concept explicitly confounds what appear (with the benefit of hindsight) to be separate economic phenomena with different political origins, like the service and knowledge transitions.

Crucially, the perspective also fails to explain how the AKE is truly different from the prior economic order in which the production of knowledge was also important. A key contention, in this paper, is that scientific knowledge and technological development have always been central components of the American political economy, as evidenced by the fact that the United States Constitution included a clause giving Congress the power “[t]o promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries” (Art. I, Sec. 8, Clause 8). The distinguishing characteristic of the AKE is not its reliance on scientific and technical knowledge to produce economic benefits or promote military supremacy; it is rather a politically negotiated shift in consensus about who will own and control the utilization and dissemination of that knowledge.

In this paper, I define a knowledge economy as a politically negotiated strategy wherein the production of commodified technological knowledge, or IP, is the primary avenue for achieving economic development. This definition conforms more closely with the political history of AKE development that I outline below. The period that preceded the AKE, which I will refer to as the American knowledge society (AKS), married heavy investments in science and technology with norms of openness, public disclosure, and peer review; the AKE added investments in business creation (or entrepreneurship) to its AKS legacy but departed from the AKS by prioritizing norms of appropriation over sharing so that American IP producers could capture lucrative economic rents. The AKE’s reliance on IP becomes apparent once one shifts the focus from economic indicators or symptoms to the political developments that shaped the AKE, many of which unfolded years after Bell (1974) wrote.
The primary policy tool for creating a knowledge economy is a special form of IP, the United States patent. A patent is essentially a tool the federal government uses to incentivize investments in technological development in the present at the expense of future anti-competitive risks including the monopolization of a technological domain and the suppression of additional investments and innovation. From the perspective of the interest group that dominates AKE development, IP producers, patents 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 (Stiglitz, 2013, p.54). Though a single blockbuster patent can confer tremendous economic power to its producer, 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 hold tens of thousands of patents.

A knowledge economy is an economy which emphasizes the production of commodified technological knowledge, so it is located much more firmly in political debates about patents and trade secrets rather than other forms of IP like copyrights and trademarks, even though computer software can receive copyright protection. The copyright system principally protects literary and artistic works while the trademark system effectively protects brand names. Copyright producers like major film and recording companies do play a pivotal role in AKE politics, but they are mostly free riders. As IP producers, they have common interests with firms that patent. But it is hard to discern any domestic or global political consensus in favor of an economy that distinguishes itself by continuously extending the copyright for the likeness of a cartoon character or a novel or a rock music recording. Copyright interests more clearly illustrate that knowledge economies are prone to rent-seeking. But they are free riders on a broader movement that has generated some, if qualified, political consensus: the movement to generate economic prosperity and compete in a global economy by pushing the technological frontier. Below, I use the term “IP producers” to mostly mean patent producers.

IP producers are the essential interest group in AKE political development. As an interest group, IP producers hail from many different industries and sectors of the economy, but despite their diversity, IP producers are bound by a common interest in maximizing the rents they can generate from their most important capital asset, their IP. They 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.

Knowledge economy professionals constitute a second major interest group in AKE development. The creation and utilization of IP inherently requires a tremendous amount of professional services from the lawyers that draft and litigate patents to the venture capitalists that largely stake their investments on new and exciting IP. The economic and political interests of these knowledge economy professionals are substantially aligned with those of IP producers. In addition to sharing interests, both groups also tend to engage in politics in smaller special interest organizations that reflect occupational and sectoral boundaries, some being the Semiconductor Industry Association, the National Venture Capital Association, and the Intellectual Property Section of the American Bar Association.

Patents are the most conventional way, but not the only way, by which IP producers generate
economic advantage. First-mover effects, network effects, control of internet user information—
technology firms can leverage these and many other mechanisms to achieve a form of market
power in the AKE without relying on patents. At the same time, these forms of achieving 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. The AKE enabled even if it did not expressly sanction these types of conduct,
and political representatives today are still dealing with the repercussions.

The AKE should not be confused with the service transition. The service transition arguably stems
from a form of Keynesian macroeconomic management that put American manufacturers at an
extreme competitive disadvantage for the sake of rebuilding the economies of formerly fascist
states, specifically Japan and Germany (Stein, 2010). Accordingly, the service transition was mostly
complete before 1980 (Loecker and Eeckhout, 2017, p.17). In contrast, the AKE is rooted in a
host of federal laws that Congress passed from 1980 to 1994, as argued below. The confusion
between the AKE and the service transition arises from many places. Writing in the early 1970s,
Bell (1974) was too close to the developments of his time to perceive the difference. Also, before
the personal computer revolution created consumer commodity markets in the 1980s, IP producers in
information technology generated most their revenue by offering computing services to businesses.
The fact that the AKE depends intensely on legal and financial professionals for its maintenance
further complicates the matter. Regardless, as I argue below, the AKE is actually based on a
rejection of the form of diplomatic Keynesianism that produced the service transition, and it can be
interpreted as the government’s response to the perception that the service transition would not be
enough to generate economic and military supremacy.

The American version of the knowledge economy developed mostly in the 22-year period between
1972 and 1994. In the presidential election of 1972, 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 industry 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 (Geismer, 2015, Ch. 6).

If AKE development began around 1972, then it drew to a close around 1994 when American,
Japanese, and European multinational corporations succeeded in obtaining a new regime for
governing global trade, the World Trade Organization, with a new set of rules that made IP a
central component of global trade negotiations (TRIPS). At this point, as I show below, the main
contours of the AKE, and the global knowledge economy within which it is located, had been
drawn. Many important political debates that affect the AKE took place after 1994. Democrats and
Republicans engaged in controversial debates about the Advanced Technology Project (Negoita,
2011), the National Institute of Standards and Technology, and the Trans-Pacific Partnership, for
example. But these and other debates merely extend the political battles waged from 1972 to 1994
into the present. The AKE still has its episodic flare ups even today, but the lines of political conflict
in these debates were drawn long ago.
3 The Post-War Consensus and the American Knowledge Society

The post-war political consensus on economic policy that produced the AKS differed from the politics of the AKE in several material respects. In terms of macroeconomic management, both parties relied primarily on Keynesian tools for increasing aggregate demand, like robust social welfare policies that would 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 (Hart, 1998, Ch. 6). 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 (Stein, 2010).

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 from politics and would not interfere with corporate prerogatives on technological development or practice industrial policy (Kleinman, 1995; Hart, 1998).

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. 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 (Feldman, Colaianni, and Liu, 2007). As this example reveals, IP producers in the AKS were often divided, 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
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 (Hart, 1998, pp.171-2).

The manner in which these early political debates unfolded ultimately committed the United States to a heavily decentralized and unplanned form of science and technology policy. 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 (Kleinman, 1995, pp.152,176-77).

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. In 1950 the Korean War began and in 1957, the Soviet Union placed the first artificial satellite into orbit. Though national security imperatives influenced most if not all federal institutions of scientific and technological development (Hurt, 2011; Weiss, 2014), 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 timeframes, 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 (Block, 2011). But even outside of DARPA, the AKS nurtured deep ties with the national security state in both civilian venture capital and academic research (Hart, 1998, p.172).

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 has had been filed over the prior 48 years, and Arnold and Berge together succeeded in 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 (Hart, 1998, 2001). Patents remained a constitutionally sanctioned tool to protect upside investments in new technologies, but antitrust officials heavily policed the downside anti-competitive risks.

The AKS remained situated in a global economy that prioritized democratic procedures for determining how nations across the globe would leverage intellectual property. The Paris Convention for the Protection of Industrial Property of 1883 remained the dominant legal framework, 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 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 supply-side devices like promising tax benefits to lure established businesses away from one region and into another. 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 supply-side 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 (Eisinger, 1988; Graham, 1992).

Because the judiciary plays a prominent role in shaping patent law, any depiction of the AKS that neglects the judicial branch remains incomplete. One essential 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 at least three 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 (Scherer, 2009).
Just as the structure of the judiciary protected competing views about the role of patents in the AKS, so too did the substance of federal case law impose 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.\(^1\) Similarly, the doctrine of sovereign immunity shielded state universities and agencies from patent infringement liability.\(^2\) 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 (Feldman, 2003). 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.”\(^3\) 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.

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 new institutions, like DARPA and the NSF, to ensure 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 promoting technological investment. 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 supply-side strategies 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 of these characteristics, the AKS is distinct from the AKE.

4 Three Geographies of American Knowledge Economy Development

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 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 with no capital controls, that investment

\(^1\)Whittemore v. Cutter, 29 F. Cas. 1120 (Cir. Ct. Mass 1813).
could simply move overseas. Food shortages, rising mortgage rates, and America’s dependence on foreign oil cartels produced unprecedented 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 (Stein, 2010).

The political failures at the heart of the economic calamity produced, in turn, dramatic changes within both political parties. The Republican Party somewhat quickly settled on an alternative based on market fundamentalism. 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 (Stein, 2010; Appelbaum, 2019).

The Democratic Party’s response emerged only gradually over the course of the 1970s. Poor economic management caused economic losses for blue collar workers and economic gains for service workers including those professionals with advanced degrees who were immunized from foreign competition by state licensing requirements (Baker, 2016, Ch.7). As the lawyers and bankers of the service transition rose in economic power, they simultaneously began to exert more political power in the “New Politics” of the 1970s. Nominally committed to the Democratic Party, many followed lawyers like Ralph Nader who viewed the federal government as inherently corrupt and prone to “regulatory capture.” Perhaps as a result, the public’s trust in government plummeted (Lipset and Schneider, 1983). Many activists of the New Politics demanded and obtained new regulation in areas like environmental protection and workplace safety to mitigate the excesses of capitalism and they leveraged their skill sets to achieve those ends, relying more on lobbying and advocacy than protests and political movements. To veil the hypocrisy inherent in reducing interest group influence by forming yet more interest groups, they proclaimed themselves the purveyors of the “public interest” (Vogel, 1989; Stein, 2010; Waterhouse, 2014).

The main problem was that the Democratic Party, in the throes of the New Politics, had no vision for producing economic 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. 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 (Silk and Vogel, 1976; Vogel, 1989). 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 disadvantaged exports. The New Democrats remained aloof to their plight. The pejorative the New Democrats used—“smokestack industries”—to refer to American manufacturers 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 (Stein, 2010; Waterhouse, 2014).

Ultimately, if slowly, the Democratic Party found its alternative to Keynesianism at the very end of the decade in the idea of the AKE. 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 vision was shaped by many actors. It was shaped by the IP producers that rewrote global trade agreements and advised presidential administrations on industrial innovation policy and economic competitiveness. It was shaped by
the suburban liberals who worked for IP producers. And it was shaped by the political imperatives of divided government. As a politically negotiated strategy for producing economic prosperity, its logic required that the Party abandon the “smokestack industries” of American manufacturing and elevate the interests of IP producers on the path to creating a “post-industrial” society.

4.1 The global knowledge economy

The story of how IP producers in the United States created the global knowledge economy (GKE) is a story of surprising corporate influence over global economic policy, but 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. 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.

The agreement’s history, which I sketch below, is subversive to the view that pluralist competition and decentralized decision-making insulate the American government from interest group influence (Bauer, de Sola Pool, and Dexter, 1972; Heinz et al., 1993; Baumgartner et al., 2009). It suggests, in contrast, that under the right circumstances, interest groups can effectively appropriate entire government agencies like the office of the United States Trade Representative (USTR), though regulatory capture can be difficult to diagnose in these circumstances (Carpenter and Moss, 2014). The agreement’s history also reveals the significant domestic trade-offs implicit within the AKE, especially the extent to which IP producers got what they wanted at the expense of American commodity producers.

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 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 General Agreement on Trade and Tariffs (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 (Ryan, 1998, pp.11, 67-68; Scherer, 2009, p.204). General Motors was the only firm that could be characterized as a domestic manufacturer and its motives for participating are 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 the 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—a 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 (Ryan, 1998, pp.106-111; Scherer, 2009, pp.204-206).

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 (Ryan, 1998, p.68). 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 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 (Scherer, 2009). 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 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 (Ryan, 1998, p.68). President Carter appointed Pratt to the ACTPN in 1979, and Pratt became the Chairman in 1981.
developing country” under the Generalized System of Preferences (Section 503).

Close 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 (Stein, 2010, p.95). 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 Brazil in 1985 (Ryan, 1998, pp.12-13,73-79). By the end of the 1980s, the United States would employ the same leverage in other settings, making patent reform a necessary precondition of, for example, Latin American debt relief. 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 domestic growers and manufacturers to more competition, and even subsidize that competition, so long as IP producers could obtain stronger patent rights abroad. It was expressly choosing domestic agritech over domestic agriculture.

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 (Scherer, 2009, pp.203-4). 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 actually 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. Legal regimes built 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.

IP producers and the USTR worked together in achieving TRIPS in a way that contravenes the claim that interest groups have few opportunities to shape policy. For example, the USTR needed concrete evidence of the economics losses associated with “IP theft” to convince foreign negotiators that it was actually a problem, so the agency solicited 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 opened up with former USTR negotiators joining the staffs of IP firms during the Uruguay Round of negotiations. In fact, the representatives of IP firms even joined representatives of the U.S. government at the actual negotiating table, passing notes as the negotiations proceeded (Drahos and Braithwaite, 2003, pp.94-98,141).

As this history suggests, the global knowledge economy is not a product of inevitable economic forces. It is instead a politically negotiated regime for global trade in which developed nations accepted and subsidized competition in commodities markets while developing nations agreed to adopt patent standards that generated lucrative rents for multinational IP producers. Significant divisions and tensions remained within the international coalition of IP producers (Drahos and Braithwaite, 2003, p.119), but in a conventional story of collective action, IP producers overcame those differences to align behind a specific set of rules for the GKE. In this system, multinational companies retained the competitive advantage of cheaper labor in developing nations when it came to manufacturing commodities while generating supra-competitive returns in global sales by virtue of global patent protection. The economic losers were those growers and manufacturers who wished to produce in the United States. For American businesses, the writing was on the wall: they could generate a competitive advantage by generating rents through patent protection and reducing costs by relocating production offshore. Innovation and outsourcing would become, after intense political conflict, the central pillars of the AKE. But first, IP producers would have to deconstruct much of the AKS.

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 (Johnson, 1982). It began during the Carter administration and reached its apex during President Reagan’s first term, but 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 (Graham, 1992).

In the anti-government era of Reagan’s presidency, the answer would simply be no. Conservatives could live with federal investments that maintained national security and might create economic advantage as a byproduct, but they would not support a broader organizing role for a government agency that might elevate, say, environmental over defense interests. But liberals had mixed opinions too, reflecting the divisions that the New Democrats sowed within American liberalism. For Bell (1974), industrial decline was an inevitable and perhaps beneficial outcome in the long
transition to a service and knowledge-oriented post-industrial society. For Cohen and Zysman (1987), manufacturing actually generated innovation so that any nation which allowed industry to decline would lose an important competitive advantage in the future knowledge economy. For Reich (1983), the United States needed an industrial policy that focused on human capital like investments in education and occupational training. For Bluestone and Harrison (1982), though deindustrialization devastated communities across the United States, industrial policy was just another name for “lemon socialism.” For Kuttner (1991), the United States needed some form of industrial policy if only because most other industrialized nations had them and used them effectively to undermine American interests. When leaders of the Democratic Party like Walter Mondale or Bill Clinton waded into these debates, they favored Bell over Cohen and Zysman, Reich over Kuttner (Stein, 2010, pp.280-81). They leaned towards industrial policies that would create an AKE with measures that New Democrats already supported, like increased spending on higher education, and not one that would rejuvenate “smokestack” industries. They sided with those scholars affiliated with Harvard and MIT and not those affiliated with U.C. Berkeley.

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 (Graham, 1992). 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 economic recession (Turner, 2006). 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. The membership in the patent subcommittee included representatives of 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 patent lawyers 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 producer’s 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,
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 encouraged 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 (Advisory Committee on Industrial Innovation: The Industrial Advisory Subcommittee on Patent and Information Policy, 1979, pp.148-49). 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.4

IP producers had another problem, though. Patents promote innovation at the risk of future anticompetitive 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” (Advisory Committee on Industrial Innovation: The Industrial Advisory Subcommittee on Patent and Information Policy, 1979, p.164). In retrospect, their recommendations seem modest. They could not have foreseen that the Reagan revolution would all but eliminate antitrust scrutiny of mergers and acquisitions (Short, 2019). To the end of developing the AKE, Congress joined in that effort. 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.

The politics and legal technicalities behind many of these bills is much more complex than the sketch above suggests, but the general trend was to strengthen patent laws and diminish antitrust enforcement to the benefit of IP producers. In the process, policymakers abandoned most of the tools—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, actually 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 (Rai and Sampat, 2012). As a result, no one actually knows whether patents developed with 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 global multinational firms remained protected by a lack of transparency.

The outpouring of patent reform legislation also altered the AKE’s political dynamics. In the

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conventional way that new policies create new interest groups to support them (Campbell, 2003),
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
(Short, 2016). 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.

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 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. In most periods most American patent law has been 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—the New Democrat activist par excellence—can
shape while avoiding the demands of coalition building and the multitude of veto points present
in the federal system. The 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 (House of Representatives Report 97-
312, 1981; Sachs, 2013). 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 of 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
(Meador, 1992; Newman, 2002; Scherer, 2009).

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
causing a flood of patent applications that were approved and held valid at much higher rates in
judicial disputes (Landes and Posner, 2004). 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 outpouring of patent reform legislation from 1980-1994, summarized in Table 1, belies the
notion that the industrial innovation debate produced no consensus at the federal level (Graham,
True, the parts of the debate concerning reindustrialization and central planning were quickly dispatched during Reagan’s presidency. But a strong bi-partisan consensus developed in favor of industrial innovation policies that would be achieved instead through patent reform.

The values and policies inherent in the patent reform effort signify the dramatic shift between the AKS and the AKE. The AKS viewed patents with skepticism and as a device for constructing cartels and suppressing innovation; its tools for generating scientific and technological advance were peer-reviewed journals that broadly disseminated the results of publicly funded research and a competitive economic environment that would incentivize ingenuity. The AKE viewed patents as the crucial device for regaining America’s declining competitiveness after thirty years of poor macroeconomic management had left the nation rudderless in an increasingly global marketplace. While academics theorized about a post-industrial society (Bell, 1974) in which “symbolic analysts” (Reich, 1983) would play an increasingly important role in producing knowledge, business activists turned to the more prosaic task of creating a policy environment where engineers would play an increasingly important role in producing IP. As politics converted the vague abstractions of the post-industrial society into the more concrete reality of the AKE, IP became the vehicle for the nation’s delivery.

The perspective that the industrial policy debate failed to produce any consensus also overlooks the fact that, although no agreement developed in favor of coordinating federally funded research, both parties chose to bolster the decentralized and security-oriented system of technology production that they inherited from the AKS. Congress amended the Employee Retirement Income Security Act (ERISA) in 1979 to allow pension fund managers to invest as much as five percent of a fund in venture capital, which caused a massive surge in venture capital investment (Eisinger, 1988; Lazonick and Mazzucato, 2013). The Small Business Innovation Development Act of 1982 essentially created a federal venture capital program administered by the Small Business Administration. The NSF began experimenting with industry-university 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 (Block, 2011). 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 New Democrats’ economic vision, and shore up declining industries that impacted national security. They are extensions of the AKS into the modern era.

Together with the system of patent protection described above, these and other mission-oriented programs continue to make up the basic infrastructure of the AKE. They also make up what Block (2008) describes as a hidden developmental state buried within the American political economy. According to Block (2008), a form of cognitive political dissonance keeps the AKE policy hidden: conservatives know the programs are needed to maintain economic prosperity and national security but cannot publicly support such an ambitious role for the state in economic development. When AKE infrastructure is politicized, it can lead to retrenchment. For example, when President Clinton tried to use the Advanced Technology Program to implement something that looked like industrial policy, and brought in a DARPA veteran to lead that effort, the program became a lightning rod for conservative opposition that ultimately led to the program’s demise in 2007 (Block, 2011). In 2017, the SBIR program handed out 5,094 awards and had more than $2.6 billion of outstanding commitments, according to the program’s website. But to keep the money flowing, the political
<table>
<thead>
<tr>
<th>Bill</th>
<th>Purpose</th>
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<tbody>
<tr>
<td>Bayh-Dole Act (1980)</td>
<td>Give industry the right to obtain exclusive licenses on university patents</td>
</tr>
<tr>
<td>Stevenson-Wydler Act (1980)</td>
<td>Give industry the right to obtain exclusive licenses on federal agency patents</td>
</tr>
<tr>
<td>Federal Courts Improvement Act (1982)</td>
<td>Create a centralized appellate authority on patent law</td>
</tr>
<tr>
<td>National Cooperative Research Act (1984)</td>
<td>Remove antitrust liability for joint ventures engaged in research and development</td>
</tr>
<tr>
<td>International Trade and Investment Act (1984)</td>
<td>Establish unilateral authority under Section 301 of the Trade Act of 1974 to sanction nations without adequate IP protection</td>
</tr>
<tr>
<td>Omnibus Trade and Competitiveness Act (1988)</td>
<td>Require USTR monitoring and investigations under Section 301; weaken the domestic industry requirement in ITC proceedings involving patents</td>
</tr>
<tr>
<td>Patent Misuse Reform Act (1988)</td>
<td>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</td>
</tr>
<tr>
<td>Patent Competitiveness and Technological Innovation Act (1990)</td>
<td>Repeal state sovereign immunity (later held unconstitutional)</td>
</tr>
<tr>
<td>National Cooperative Research and Production Act (1993)</td>
<td>Remove antitrust liability for joint ventures engaged not only in research and development, but in manufacturing as well</td>
</tr>
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Table 1: Major patent reform legislation that defines the political consensus behind the AKE.

...parties have to maintain the illusion that no one is “picking winners” or guiding our national technological trajectory. The AKE did not just inherit the AKS’s infrastructure; it also inherited the AKS’s false contention that no such infrastructure exists.

### 4.3 The entrepreneurial states

As the federal debate on industrial policy consolidated around patent reform and bolstering the hidden developmental state, 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 (Eisinger, 1988, Chs. 1-4).

The movement caught on fast, and by the middle of the 1980s the vast majority of states had 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 (Eisinger, 1988, pp.249-65). 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 (Eisinger, 1988, pp.275-89). 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 (Eisinger, 1988, p.294).

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 ExIm Bank. Though the entrepreneurial political leaders for the states turned to the same policy tools that sculpted the hidden developmental state, 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.

As entrepreneurial states adapted to the AKE, state political leaders also became prominent representatives of the AKE in federal politics. In Congress, the most prominent advocates of the AKE were Colorado Senator Gary Hart (George McGovern’s former campaign manager), his successor Tim Wirth, Massachusetts Congressman Paul Tsongas, and Tennessee Senator Al Gore. Together, these Democratic spokespersons for the AKE came to be known as the Atari Democrats. Liberal Republicans, like Congressmen Pete McCloskey and Ed Zschau, also competed for the political attention of the increasingly influential entrepreneurial class emerging out of places like Seattle and the Silicon Valley. But whether by chance or political imperatives, it would mostly be Democratic governors—California’s Jerry Brown, Massachusetts’ Michael Dukakis, and Arkansas’ Bill Clinton—that would join the fates of the AKE and the Democratic Party.

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 re-
port, 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” (Executive Advisory Council, 1982).

Where Brown failed to attain the Democratic nomination, Dukakis eventually succeeded and, in some respects, his career better represents the shifting politics of the New Democratic coalition. 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 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” (Geismer, 2015, p.268), 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 (Eisinger, 1988, pp.67-69). In 1985, Raytheon alone received $2.3 billion in defense contracts (Geismer, 2015, p.270) and aggregate defense production came to roughly $12 billion or 8.3 percent of Massachusetts’ net product (Lampe, 1988, p.11); in the same year, the state’s entire general operating fund came to only $5.6 billion (United States Census Bureau, 1985, p.278). 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 (Lampe, 1988, p.16).

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 with “public-private” partnerships to promote startup formation. The National Governors’ Association named him the most effective governor in the United States in 1986 and Time magazine described him as “the pacesetter for the nation’s transition to a high tech service oriented economy” (Geismer, 2015, p.276). These endorsements, and Dukakis’ victory in the 1988 Democratic primary, reveal how the Democratic Party ultimately found its post-Keynesian alternative in the AKE. But it also suggests that affluent suburban liberals at the heart of the Democrats’ political realignment clamored for national leadership on economic issues rooted in the more robust, targeted interventions that characterized state-level management. Tellingly, Time magazine noted that Dukakis often campaigned for the presidency as if he was running for “Governor of the United States” (Geismer, 2015, p.275).
Clinton ultimately succeeded where 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 (Geismer, 2015, p. 278-79). 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 (O’Mara, 2019, pp.292-96).

Young’s endorsement 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 (O’Mara, 2019, pp.192-95). But the Reagan era also widened political cleavages amongst 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 bristled at the idea of Democrats claiming the mantle of entrepreneurship and started his own Commission on Industrial Competitiveness, which Young chaired (O’Mara, 2019, pp.213-15). The Commission released its report in January of 1985. It painted a bleak picture of 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 (Graham, 1992, pp.168-69,220). 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 (O’Mara, 2019, pp.223-26). 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 story of the entrepreneurial states is therefore not simply a story about governors parroting the hidden developmental state behind the AKE. Though the tools the states used to spur AKE development looked a lot like the central pillars of the federal innovation system, the states adapted those tools to meet local needs and rectify the severe imbalances of the federal framework. Additionally, the story of the entrepreneurial states is not one in which state leaders pursued AKE development in a vacuum. On the contrary, the governors that led the way in articulating industrial policy had concrete ambitions for federal office. If the industrial policy debate devolved, in some respects, to the states as others have claimed (Graham, 1992), it also revolved back to the federal level as Democratic governors leveraged their experience in engineering economic revitalization to make claims on the presidency. Brown, Dukakis, and Clinton—not Hart, Gore, or Tsongas—would go on to articulate 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 amongst technology executives and elected officials during the Reagan and Bush administration. 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 SEMATCH as exemplary federal policy, the future lay with Clinton.

5 The American Knowledge Economy as an Engine of Inequality

As the history conveyed in the last section suggests, the AKE is a politically negotiated strategy for generating economic prosperity, one that the Democratic Party played a crucial role in designing. For many liberal voters and scholars today, the AKE remains an object of adulation, a positive and progressive vision for an economy that produces an endless stream of fascinating new technologies, some of which have the potential to ameliorate systemic problems like environmental degradation. It is a vision that relies on education, not inherited wealth, as a path to participation in an economy that bestows the largest rewards on those ambitious few who take the largest risks.

But the vision also hides significant trade-offs that are apparent in the politics that created and sustains the AKE. The gains for IP producers came, after all, at the expense of many blue-collar workers and domestic commodity producers. But it is the vision’s reliance on IP that produces the greatest potential threats to American society. As described below, the historical record and mounting empirical evidence suggest that the AKE is an engine of massive geographic, economic, and political inequalities. The divisions sowed by those outcomes may force a fundamental reevaluation of the terms on which the AKE develops in the future.

5.1 Geographic inequality

The AKE magnifies geographic inequality in a variety of ways and at multiple levels of geography. As the North-South divide over TRIPS suggests, the GKE reproduces global inequality by increasing the monopolistic rents that accrue to IP producers of wealthier nations while suppressing the economic and technological development of less developed nations. Though a core contention of this article is that copyright interests are mostly free riders in the GKE, one political struggle from the copyright domain captures the extent to which IP producers can shape economic development across the globe. In 1960, many former colonies and other developing nations faced substantial shortages in basic textbooks and their citizens could not afford the high royalties paid by consumers in more affluent nations. But when the leaders of those nations suggested revising the global copyright regime (the Berne Convention for the Protection of Literary and Artistic Works of 1886) to account for their plight, they triggered what legal scholars now call “a crisis in international copyright.” That political crisis ended with no meaningful changes to the status quo. From the perspective of IP producers, the economic logic is simple: any lowering of global legal standards would allow individual publishers to break ranks and bilaterally negotiate with developing nations to supply textbooks at much lower royalties, and those copies could be exported back to developed nations. From the perspective of the former colonies, global copyright agreements and the substance of their own copyright laws are legacies of colonialism, and IP producers are stifling the free flow of information that is so crucial to development, all for the sake of maintaining a global cartel (Drahos and Braithwaite, 2003, pp.774-79). Other examples, like Nelson Mandela’s experience trying to import patented HIV medication into South Africa, abound. They all point to possibility that the GKE is a tool for keeping less developed nations relatively impoverished.

The AKE also perpetuates a form of North-South divide within the United States and therefore
magnifies regional inequalities. The New Democrats' indifference to "smokestack" industries had a concrete geographic bias from the outset: decades of federal defense spending (Schulman, 1994), right to work laws, and tax incentives precipitated a substantial relocation of traditional manufacturing from northern states to the southern Sunbelt (Eisinger, 1988, pp.49,57-60). In the crucible of the 1970s, AKE adherents claimed to reject a mode of economic production that, in their view, had little prospect for wage growth and harmed the environment. But they also implicitly rejected the regions within the United States where that mode of production still predominated. When trade negotiators under Reagan linked GSP access to global patent standards, they boosted the economic advantages of IP producers who tended to reside in coastal metropolitan regions at the expense of commodity producers from other regions, like the Sunbelt, who were exposed to intense economic competition.

The AKE does not simply solidify these kinds of regional advantages but also increases their severity over time. Economists refer to this effect as agglomeration or increasing returns to scale. Agglomeration occurs in the economic world when early movers (firms or regions) capture an advantage that tends to accelerate over time. In this perspective, a region like California’s Silicon Valley develops, by some accident, robust institutions for venture capital and an entrepreneurial culture with little risk aversion, those institutions generate some successes (startups that rapidly dominate markets in new technologies), and those successes attract yet more engineers, investors, and businesses that accelerate economic development. Agglomeration tends to occur not because of any single actor, but because the rational decisions of many actors leads to a kind of economic ecosystem that thrives because its constituent elements—thick labor markets of highly educated workers, employers drawn to those types of employees, and local legal and financial services to intermediate the needs of those kinds of employers—are mutually reinforcing. Agglomeration is therefore a theory in which early advantages are largely accidental or unplanned and rational actors generate desirable economic outcomes in the aggregate (Moretti, 2013).

For political scholars, this framing ignores the fact that the government often plays a central role in creating early advantages and policy largely determines how the economic benefits of those advantages will be shared. In some ways, this perspective is abutted by the fact that the hidden developmental state is, in fact, hidden. California’s Silicon Valley, Massachusetts’ Route 128 corridor, and the innovation hub surrounding Seattle may owe a great deal to luck and individual ambition. But it is hard to ignore the fact that aerospace and defense contractors like Lockheed Missiles and Space Company, Raytheon, and Boeing resided at the heart of those regions and profited enormously from the Cold War defense buildup (O’Mara, 2019, pp.29).

One way to reconcile these perspectives is to think of the AKE as relying on certain kinds of infrastructure like universities and national laboratories much in the same way that Fordist economies rely on traditional infrastructure like ports and bridges. Federal and state governments play a central role in building and sustaining both kinds of infrastructure, but one important legacy of the industrial policy debate and economic discourse of the present day is that the government’s role in building AKE infrastructure remains largely invisible. This infrastructure influences but does not determine the actions of ambitious entrepreneurs and the probability of their success. The ecosystem may thrive because of or in spite of its inherited infrastructure, but it is shaped by its infrastructure, nevertheless.

Focusing on infrastructure reveals how government policy influences the distributional effects of knowledge economies. Consider, for example, the political debate that took place between Vannevar Bush and Harley Kilgore over the founding of the National Science Foundation. Bush, dean of MIT’s College of Engineering and founder of Raytheon, wanted the agency to distribute
federal funds according to a system of peer-review executed solely by scientists and insulated from
the concern of other interests like labor leaders. Kilgore believed that such a system would bestow
most of its benefits on a handful of defense contractors and elite universities, like Raytheon and
MIT, and proposed more democratic modes of decision-making as well as funding formulas that
would have distributed specified shares of federal monies to regions and firms that were relative
laggards in scientific and technological development. Both choices are inherently political and have
distributional consequences. That Congress sided with Bush demonstrates that Congress wished to
maximize scientific output regardless of the distributional consequences.

The AKE also magnifies geographic inequalities within regions at more local levels of governance.
The largely white and affluent suburban professionals that emerged so forcefully as AKE pro-
ponents in the New Democrat coalition were incredibly active in state and local politics, but as
these suburban liberals splintered in the 1970s, they failed to produce policies that would share the
benefits of the AKE more broadly. In Boston’s Route 128 corridor, for example, suburban residents
readily embraced minimum lot sizes and zoning restrictions that propped up housing prices, mini-
mized the tax burden that supported local schools, and restricted the growth of more affordable
housing. They also aligned behind anti-growth initiatives that prevented public transportation
from making suburban areas accessible to urban residents who did not own a car. Those liberals
who supported open housing found themselves engaged in intense political combat with their
former collaborators, some of whom now felt that economic exclusion was an acceptable side effect
of anti-growth policies that would protect the environment, others who became squeamish in the
face of policies that might undermine the excellence of their own children’s local public schools,
and others who were already over-committed in battles over feminism and other fronts of political
combat. The economic and racial implications of this stalemate did not go unnoticed. Working class
whites and blacks in the inner city struggled to gain access to the new knowledge economy jobs of
the moment and the educational opportunities that would help their kids grasp the knowledge
economy jobs of the future. Residents championed Route 128 as America’s “Technology Highway”;
the United States Commission on Civil Rights bemoaned “Route 128: Boston’s Road to Segregation”
(Geismer, 2015, Chs. 7-8).

5.2 Economic inequality

Because of its deep reliance on IP, the AKE also magnifies economic inequality. Patents do not
necessarily have to produce economic inequality, even though they inherently promote rent-
seeking. If the social and political structure in which entrepreneurial firms innovate have robust
mechanisms for rent sharing, the gains can be distributed more broadly within the boundaries
of the firm (Lazonick and Mazzucato, 2013). Similarly, the government can tax those rents and
invest the revenue in some way—whether by social welfare spending or building more robust AKE
infrastructure—to make the AKE more equitable. With appropriate institutions, a society built
around IP can at least theoretically generate inclusive growth.

Sadly, mounting empirical evidence suggests that patent rents are an important source of rising
economic inequality and that the AKE lacks mechanisms for either sharing those rents more
broadly or investing some portion of the rents in ways that will generate economic opportunity
and prosperity for more than an elite few. Galbraith (2012, Ch.2) finds, for example, that the value
of the technology-heavy NASDAQ is strongly correlated with income inequality between counties
and that only fifteen of more than three thousand counties with substantial tech footprints explain
all of the between-country increase in income inequality from 1994 to 2000. Similarly, Aghion et al.
find that top income shares at the state level (but not broader measures of inequality like Gini indexes) are strongly correlated with the value of the region’s patents, and that a one percent increase in the number of patents awarded to the firms in a state in a single year will increase the state’s top one percent income share by 0.2 percent. Schwartz (2016) similarly finds that, when combined with outsourcing of non-essential labor and capital, IP rents contribute to rising income and wealth inequality amongst both firms and individuals. Using a unique dataset containing demographic information about the inventors named on patents issued from 1996 to 2014, Bell et al. (2016) find that children of low-income parents are much less likely to become inventors than children of higher-income parents and that some of the gap stems from differences in human capital that emerge in early education. This result concretely connects suburban exclusivity, described above, with declining participation in the knowledge economy. Finally, Koh, Santaeulalia-Llopis, and Zheng (2015) contend that all of the decline in labor’s share of national income can be attributed to the capitalization of IP in national income and product accounts, so that the decline in labor’s share of income can be viewed as the product of a structural transformation in the United States towards a society with more IP producers.

An economy organized around IP can, but does not necessarily have to, experience high degrees of inequality. Even if the rents that patents generate are substantial, the economic impact may be ambiguous or even positive if patent ownership is broadly distributed. For example, if we think of patents as a conventional capital asset like a housing, it becomes clear that home ownership can be a path to broadly shared prosperity if almost everyone owns a home (even if home values vary dramatically) but not if a few people have mansions while everyone else goes homeless. Put simply, knowledge economies organized around IP producers may only generate inequality if IP production and ownership is highly concentrated. Similarly, IP ownership may only exacerbate inequality if it leads to concentration within sectors or industries. The evidence on both fronts reinforces the view that IP ownership generates economic inequality in the AKE. The share of patents owned by the top 1 percent of patenting firms has grown dramatically over time, the largest firms purchase substantial amounts (55 percent in 2010) of new patents by acquiring small emerging competitors, and patent ownership since 2000 is strongly correlated with industrial concentration (Akcigit and Ates, 2019; Grullon, Larkin, and Michaely, 2017).

Even so, a knowledge economy need not generate economic inequality if it has robust institutions for rent sharing or progressive means of taxing and investing those rents. Here, again, the evidence is troubling. There is some positive news when it comes to rent sharing. Despite the fact that legal and contractual norms generally allow firms to acquire ownership in all the IP that their employees generate, there is some evidence that firms share the rents they generate from patents. Kline et al. (2017) find, for example, that within the population of startups applying for their first patent, workers capture on average 29 percent of the patent-induced operating surplus, though the share is larger for named inventors and lower for others. Since the total market capitalization of much larger firms includes the economic value of each firm’s patent portfolio (Kogan et al., 2017) and those same firms increasingly use stock options as a form of employee compensation, some employees indirectly acquire a financial stake in the value of their employer’s patents. At the same time, these ownership stakes are minuscule compared to those that accrue to executives. Moreover, the options are mainly used to eliminate tax liability, which further shackles the government. The “excess stock options” tax loophole, which allows companies to deduct stock options from taxable income, allows some of the world’s largest IP producers to avoid paying any taxes to the federal government. As a result, even if stock options permit some rent sharing, they undermine the government’s ability to tax and reinvest IP rents.
IP producers can also use IP—and not just stock options—to foreclose the government’s ability to reinvest patent rents. One of the lesser known quirks about the U.S. patent system is that companies can use patents to implement a basic tax avoidance scheme. A company like Apple can, for example, transfer ownership of its patents to a shell company incorporated in Ireland and then pay “royalties” to that shell company for using those patents when making and selling consumer products in the United States. The overall effect is to shift income that would otherwise be recognized in the United States, and taxed accordingly, to a low or no tax jurisdiction. That income cannot be repatriated without incurring a corporate tax. But some tech firms have become so powerful that they do not need the income for investment and are willing to park the money offshore until the federal government incentivizes repatriation by providing a tax holiday. There have been two such tax holidays in recent history, one in the Homeland Investment Act (HIA) in 2004 during George W Bush’s administration and another in the Tax Cuts and Jobs Act (TCJA) in 2017 during Donald Trump’s administration. The amount of money at stake is not trivial. Shortly after the TCJA was signed, Apple announced it would repatriate $285 billion. There is evidence that, in both instances, tech companies used small amounts of the repatriated dollars for new investments or increasing employment, and that the lion’s share of the income was used to pay dividends and buy back stock, which mechanically increases stock value and creates capital gains to stockholders (including executives with stock options) (Dharmapala, Foley, and Forbes, 2009; Lazonick and Mazzucato, 2013; Schwartz, 2016). The AKE therefore enables firms to use IP to avoid taxation, and even when foreign revenue is repatriated, it is utilized in ways that exacerbate economic inequality.

The economic inequality created by the AKE has troubling implications for gender and racial inequality as well. Though the picture has improved, women remain underrepresented in engineering. The Society of Women Engineers produces annual reports documenting the obstacles that dissuade women from pursuing a degree in engineering. But even if we (falsely) assume that the substantial gender disparities in technical education reflect personal or group preferences, those women who do acquire the education and skills needed to compete for employment with IP producers still encounter deeply entrenched cultures of sexism and gender discrimination in the workplace (O’Mara, 2019; Chang, 2019). Unsurprisingly, some empirical evidence supports the view that IP producers also discriminate against women when determining compensation. Kline et al. (2017) found, for example, that while startups share on average 29 percent of patent-induced operating surplus with their employees, virtually all of that surplus accrued to male employees. Even when limiting the analysis to those firms that employ both genders, the authors found that patent allowances exacerbate existing gender earnings gaps. Bell et al. (2016) found that only 15 percent of inventors born in the 1980s were women, and that the large gender disparity cannot be explained by differences in education or human capital. They also found substantial racial disparities in patent inventorship that cannot be explained by differences in education or human capital.

The analysis above suggests only some of the ways that the AKE produces economic inequality, and exacerbates gender and racial differences, but it also points to massive shortcomings in the prevailing framework for understanding the connection between technology and inequality. According to the theory of skill-biased technological change, exogenous changes in technology like the emergence of personal computers allowed some more skilled workers to become much more productive (those who could use computers to work more efficiently) while it simultaneously made other less skilled workers obsolete (clerical workers whose routine tasks could now be handled by computers). This in turn caused an increasing skill premium reflected in a widening gap between the average wages earned by college graduates and the average wages earned by non-college graduates. Accordingly, technology induces higher demand for skilled labor and if educational
investments do not supply higher levels of college educated workers, inequality will increase (Goldin and Katz, 2008; Autor, 2014). The theory has its skeptics (Galbraith, 1998, Ch. 2). But the theory’s biggest shortcoming, when it comes to understanding the inequality that the AKE produces, is that it misleadingly suggests that education alone is the answer.

Part of the solution may lie in not only increasing the supply of college educated workers but making access to high quality education more equitable. More importantly, the AKE will most likely continue to generate substantial inequalities so long as it puts the interests of IP producers over the interests of commodity producers in global trade agreements, so long as IP ownership remains concentrated in the hands of a few elite firms and universities, and so long as IP is used in ways that enable tax avoidance on highly unequal forms of employee compensation. A core contention of this article is that technological development is not exogenous but is substantially shaped by political processes. But even if we indulge the assumption that politics plays no role, the history of AKE development and the empirical evidence describing its economic effect suggests that deep structural problems—reached through political consensus—will prevent an influx of college educated workers from enjoying any meaningful gains in the AKE.

5.3 Political inequality

As the story of GKE and AKE development suggests, IP producers have exercised substantial influence over the legal regimes that govern international and domestic economic relations. The fact that representatives from both political parties in the United States went to such great lengths to indulge their demands suggests several different kinds of political inequality rooted in fundamental economic cleavages. Foremost, it suggests a growing inequality between the interests of domestic commodity producers and of IP producers—in other words, an economic and political cleavage among business interests. As argued above, when trade negotiators agreed to subsidize competition in commodity markets through the GSP if developing nations adopted stronger patent laws, they deliberately put the interests of IP producers and their investors over the interests of domestic commodity producers. The political consensus behind this form of globalization suggests yet another form of political inequality: American consumers enjoy lower prices in commodity markets while American workers in those markets—the blue-collar workers in the “smokestack” industries that drew so much derision from New Democrats—lost their jobs. The AKE is a therefore a form of political economy that amplifies the voices of IP producers and American commodity consumers and suppresses the voices of American commodity producers and their employees.

Other political tensions within the AKE spring from the fact that, for whatever reason, IP consumers have little if any political representation. IP consumers are not just conventional customers. Rather, they include any person or organization or government that consumes IP in the legal, technical sense, including those who wish to make, sell, or import products in which IP is embedded. The unspoken and poorly represented needs of IP consumers arise in myriad debates about the AKE. Leaders of developing nations find themselves at odds with IP producers in acquiring textbooks or addressing public health emergencies. Taxpayers question why they pay once for federal research and then pay a monopoly price later when the fruit of that research becomes part of a new consumer product. Blue collar workers question why their tax dollars support so much of the innovative process, from basic research to venture financing, but the firms that acquire IP from those investments do not have to commit to manufacturing new products in the United States. Drug consumers blanch at the power inherent in “pharma bros” who can increase the cost of essential medications by 5,000 percent overnight. The political dilemma at the root of these and
many other debates in the American political economy is that with rare exceptions—generic drug 
makers being the most notable one—IP consumers are a broad and inchoate group that have no 
organized political representation.

The AKE nurtures conventional political cleavages as well, like that between capital and labor. IP 
producers are notorious for not being unionized (Geismer, 2015; O’Mara, 2019). The lobbying arm 
of IP producers in the Route 128 corridor that was partly responsible for Dukakis’ loss in 1978 and 
his comeback in 1982 counted not a single company among is more than one hundred members 
that had union-represented workers. This at least partly reflects the fact that, historically, many 
affluent, suburban, knowledge economy professionals perceived unions as corrupt institutions that 
needlessly interfered with the imperatives of free markets. But as IP producers grow in economic 
importance and larger shares of workers seek employment in IP producers, the picture is changing. 
Some tech startups have successfully organized (Dickey, n.d.), and as the vast disparity in how 
patent rents are distributed becomes more widely known, more and more technology workers may 
turn towards unionization as a means of negotiating more equitable rent sharing.

Because patents are government sponsored tools for generating economic rents, conventional 
theories of political economy suggest that patent ownership should induce rent-seeking behavior. 
Some case studies support this view. Lazonick and Mazzucato (2013, pp. 1115-6) contend that the 
managers of IP producers lobbied heavily for two major changes in SEC regulations governing 
were responsible for defeating the Financial Accounting Standards Board’s first attempt to impose 
managers of venture capital firms, organized under the auspices of the National Venture Capital 
Associated, played a significant role in obtaining the capital gains cut at the heart of Carter’s 
tax reform and the abandonment of the “prudent man” rule for managing pension funds which 
unleashed massive sources of venture capital. In recent years, “non-practicing entities” or shell 
companies that purchase patents solely for the purpose of suing others for infringement have 
proliferated. The substantial (approaching $16 billion in 1999) and rising costs of patent lawsuits 
suggests that massive amounts of resources are diverted from productive use towards the policing 
of patent boundaries and the extraction of patent rents (Bessen and Meurer, 2008). These and other 
case studies suggest that patent rents are prone to conventional forms of rent-seeking.

But the AKE’s most pernicious political outcome may be the way it isolates the working class. A 
core contention of this article is that, because of the way the AKE developed, both political parties 
currently support policies that require sacrifices from the working class to pursue the interests of 
IP producers. The Democratic Party did so because a political realignment brought the affluent 
lawyers and knowledge economy professionals of the New Democrats into the party coalition 
while marginalizing organized labor, which the former largely viewed as corrupt. The result 
has been decades of political debates between one party that represents business interests and 
another that represents IP producers and the legal and financial service workers they rely upon. 
On economic issues at least, the working class seems to face a Hobbesian choice. The Republican 
Party categorically opposes unions and pursues economic development with deficit financed tax 
cuts that heavily favor the wealthy and may create jobs but will certainly disadvantage exports 
and favor imports. The Democratic Party supports unions but pursues economic development 
through policies that will only create jobs for a small slice of relatively affluent and educated 
workers. Before the election of Donald Trump, neither party gave any thought to rectifying the 
massive trade imbalances that leave the working class in a precarious economic position. That a 
Republican has chosen to attack that problem may reflect the fact that the AKE has left the working
class politically adrift for more than twenty years. We can only speculate as to whether the AKE is in some ways connected to what political scholars view as rising populism among the world’s advanced democracies.

6 Conclusion

The AKE is not something that happened to us. It is not a foreordained product of globalization or automation or technological development. Nor is it the logical byproduct of rational actors responding to a changing economic environment. Instead, the AKE is a politically negotiated consensus about how the United States will generate economic prosperity and compete with other affluent democracies. At the center of that consensus—but by no means the whole story—is a policy tool that scholars too often elide: intellectual property. The AKE does not seek to produce and broadly disseminate knowledge per se; it seeks instead to produce commodified technological knowledge the distribution and utilization of which its owners can tightly control. The pivotal role played by IP is demonstrated by the story of the AKE’s development: patents, not tariffs, are the most important part of modern trade agreements in the GKE; patent reform, not industrial revitalization, is the wellspring for post-industrial conversion.

Patents are not the entire story. The politics of the AKS produced a robust infrastructure that invests heavily in technological development with little political scrutiny, what Block (2008) calls a hidden developmental state. The AKE inherited that infrastructure, but the political parties mostly utilize it for their own ends. Conservatives mostly use the infrastructure to maintain military supremacy while liberals mostly use it for other objectives like greening the economy. Since the late 1970s, the states have increasingly partnered with the federal government in building this infrastructure and some have structured their programs in a way that ameliorates some of the harsh distributional effects of the ad hoc federal system. And yet, even with state involvement, this complex system of policies remains in many ways a legacy of the AKS. As an object of a political consensus achieved in a prior era, it does not provide a basis for distinguishing the AKE from what came before. IP allows economic agents to commodify technological knowledge, and the political consensus surrounding IP distinguishes the AKE from what came before. From this perspective, it becomes clear that IP producers dominated AKE development.

The AKE was developed with bipartisan consensus. A divided Congress produced its legislative moorings under one Democratic and two Republican presidents. But the Democratic Party was always its most ardent defender. The Republican Party found its alternative to Keynesianism with the Reagan revolution, but Reagan’s vision of entrepreneurship was not limited to IP producers and IP producers achieved most of their gains in this period by riding the wave of a much broader pro-business agenda. When they suggested, as HP’s John Young did, that the government could play a meaningful role in facilitating technological development, they ran up against the limits of the conservative perspective. The Democratic Party began articulating its vision of the AKE in 1972 with George McGovern’s attempt at the presidency, but in this respect at least, McGovern was ahead of his time. The Party would only begin to seriously consider its commitment to the AKE around 1978, with President Carter’s Commission on Industrial Innovation and the ensuing industrial policy debate. The line drawn from there to Clinton went through Jerry Brown, Gary Hart, and Michael Dukakis. Clinton succeeded where so many others failed partly because he recognized and seized the cleavage created by the Republican alternative.

As a politically negotiated consensus about how to produce economic prosperity, the AKE and the
policies on which it is built have concrete distributional consequences. Producers of commodities are exposed to intense global competition while IP producers are given expansive legal rights that allow them to extract substantial economic rents throughout the global economy. Blue-collar workers in “smokestack” industries see their jobs move abroad while state licensing requirements and limitations on worker visas effectively insulate knowledge economy professionals—lawyers, bankers, and engineers—from foreign competition. Those same blue-collar workers find it hard to find affordable housing in the affluent innovation hubs so that their children might attend well-funded schools and have a reasonable chance of participating in the AKE of the future. Federal funds continue to maintain a substantial knowledge economy infrastructure, but those funds are increasingly invested in only a handful of elite institutions and coastal regions with a long legacy of innovation. These and many other outcomes of the AKE are conscious, politically negotiated choices about who will participate in and benefit from the AKE. To change them, a new political consensus is needed, one that goes well beyond increasing investments in education.

References


