The Distributional Consequences of The American Knowledge Economy

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Abstract

As the American political economy has become unequal in many respects, so it has also undergone profound structural transformations in the form of increasing financialization and increasing reliance on technological innovation as a source of economic advantage as part of the knowledge economy transition. But while the relationship between financialization and rising inequality is somewhat evident, the relationship between the knowledge economy transition and growing inequality has received less attention. This article draws on a wide variety of economic, historical, and political scholarship and data to argue that the peculiar institutional form of the American knowledge economy has made it an unparalleled engine of geographic, economic, and political inequality.

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1 Introduction

Over the last forty years, the American political economy has become more unequal in many important ways. Nationwide, both the income and wealth distribution have become substantially
more polarized\(^1\) while inter-generational mobility has declined.\(^2\) These trends also have a distinct geographic expression. While many rural areas and some heavily industrialized cities have endured intense economic stagnation, a relatively small number of metropolitan areas have experienced dramatic economic growth\(^3\) and, paradoxically, these well-performing regions seem to produce high degrees of income inequality and high levels of mobility at the same time,\(^4\) contrary to conventional expectations.\(^5\) Similarly, the augmented gap in economic opportunities between rich and poor nationwide has created a widening academic achievement gap,\(^6\) and the more affluent and educated segments of the population have become much more geographically segregated.\(^7\) These developments also have a political expression as each of the two major parties in the nation’s winner-take-all political system has increasingly coalesced around the interests and demands of one side in the growing urban-rural divide.\(^8\) Leading scholars also worry that these trends are fueling the rise of populist political candidates.\(^9\) And all of this has unfolded in a context where the nation’s troubling history of racial oppression has made many of these trends even more stark for Black Americans\(^10\) and has complicated the creation of social policies designed to ameliorate rising inequality.\(^11\)

This complex thicket of troubling socio-economic symptoms emerged while the American political economy navigated two substantial transformations, both generated in response to the political and economic crises of the 1970s. One the one hand, the American political economy became increasingly financialized in the sense that larger shares of corporate profits accrue through financial intermediation rather than through productive investment or trade.\(^12\) In an effort to depoliticize macroeconomic management in the wake of Keynesian decline, the American government—led by Republicans but with the support of many Democrats—engaged in a series of policy experiments in monetary policy, financing deficits through foreign borrowing, and financial deregulation that expanded the supply of credit for financial intermediation and pushed non-financial firms

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to increasingly seek revenue through financial markets. On the other hand, the nation also accelerated its transition into the knowledge economy, but did so in way that depended intensely on the commodification of new technological knowledge in the form of intellectual property (IP).

In a context of declining economic competitiveness, the American government—led by Democrats but with the support of many Republicans—sought to generate economic advantage through the production of new technologies, but in an era of divided government, the political consensus in support of the knowledge economy converged around market-oriented reforms to strengthen IP rights in lieu of other policies that envisioned a more substantial role for the state.

In what ways have these two profound transformations in the American political economy contributed to or exacerbated the kinds of inequality described above? In a sense, the distributional consequences of increasing financialization are manifest. Investment banking in the United States has always been confined to a handful of metropolitan regions, and banking deregulation only brought more financial assets under the control of few large financial firms. Investment banks and management consultants largely hire from the nation’s most elite business schools, which restricts access to participation in the financial economy to the affluent and highly educated. More fundamentally, by making financial speculation more attractive than productive investment, a financialized economy creates large wage premiums for those highly educated professionals who can engineer lucrative financial opportunities. At the same time, some of these strategies for producing financial income, like large corporate mergers, adversely impact the working class, while others, like unregulated trade in financial derivatives, generate asset bubbles and massive instabilities in the economic order that can be especially punishing for the less affluent. Mergers and acquisitions involving large companies, for example, often generate golden parachutes for executives and enormous advisory fees for the legal and financial professionals who implement the deal, while also leading to substantial job cuts for less affluent workers. Accordingly, whether growth in large M&A exceeds or falls short of growth in aggregate income is an accurate predictor of whether income inequality in the United States will rise and fall, that the effect is heterogeneous across states, and that each state’s share of total income in legal services accurately models that heterogeneity. Other evidence suggests that increased compensation to financial sector workers may explain about 15-25 percent of the overall increase in wage inequality since 1980.

The distributional consequences of the turn towards the American knowledge economy (AKE), in contrast, are not so readily apparent and have failed to garner any systematic treatment from social scientists concerned about rising inequality in the United States. In this article, I try to fill this gap in the literature on the distributional consequences of knowledge economy policy. I start, in Section 2, by exploring the ways in which the knowledge economy transition in the United States is connected to growing financialization itself. I then explore the ways that the AKE


generates geographic, economic, and political inequalities in Sections 3-5 respectively. The core argument is that the rhetoric and the reality of the AKE do not align. As a mostly Democratic aspiration, the AKE purports to be a meritocratic economy where education and ambition, not inheritance, determines economic rewards; where dynamic processes of “creative destruction” keep the nation and its businesses on the technological frontier; and where new technologies do not simply provide a source of economic advantage but also ameliorate systemic problems like environmental degradation and resource depletion. But the more prosaic reality is that the AKE disproportionately benefits those regions that developed good AKE infrastructure during the Fordist era, those demographic groups for whom an increasingly expensive education is achievable, and those workers and businesses (namely IP producers) whom political actors deem essential to maintaining the nation’s economic competitiveness. In short, the rhetoric of the AKE masks significant trade-offs that are apparent in the politics that created the AKE and sustains it today.

2 Financialization and Intellectual Property

One of the most significant foundational claims in\textsuperscript{18} is that, to better understand changes in American political economy, social scientists must sideline their historical fixation on the occupational structure and focus more on the types of assets that generate profit in the macro-economy. Krippner, of course, was advocating for more focus on the role of financial assets and instruments. But the knowledge economy transition has made intellectual property an equally important asset class, one that is similarly amenable to speculative behavior and rent-seeking.

Consider, for example, the strengthening connection between IP production and equity finance. Though it is somewhat well known that, by strengthening IP rights, the knowledge economy transition in the United States reversed a two decade long decline in per capita patent grants to domestic firms,\textsuperscript{19} it is perhaps less well known that generating IP has also become a much more valuable mechanism for publicly traded firms to raise equity capital. Figure 1 illustrates this trend. Because the U.S. Patent and Trademark Office makes public its decisions to issue domestic patents, even study techniques can be used to estimate the stock market’s response to these decisions.\textsuperscript{20} Utilizing that data, I first aggregated the stock market response to new patent announcements for each publicly traded firm in each month from 1965 to 2010, and then charted the average firm-level stock market response in each month. As shown, even after the opening of the technology friendly NASDAQ securities market in 1971, the average publicly traded firm could expect new IP announcements to generate about $20 million in new capitalization in 1979. Only 16 years later in 1995, with the knowledge economy transition well under way, the average publicly traded firm could expect to generate almost five times that amount, or about $100 million in new capitalization (about $320 million in 2020 dollars). Another 15 years later in 2010, despite the deflation of multiple IP asset bubbles, the average firm could still expect to generate about $200 million in new capitalization, a ten-fold increase since 1979. American corporations therefore face increasingly strong financial incentives to produce IP.

Moreover, to the extent that valuable IP generates lucrative returns and creates market power, IP producers engage in much of the same financial behavior that other firms engage in, often to even

\textsuperscript{18} Krippner, “The Financialization of the American Economy.”
\textsuperscript{19} Nicholas Short, “The Distributional Consequences of the American Knowledge Economy” (Working Paper, April 2021).
The Stock Market Increasingly Values IP Production

Figure 1: The average monthly stock market response to announcements, by the U.S. Patent and Trademark Office, of the decision to issue U.S. patents to publicly traded companies, in millions of 1980 dollars. Stock market response data comes from Kogan et al. (2017), which estimates individual patent values using event study techniques. Individual patent values are first aggregated (summed) at the firm level and then averaged across firms in each month.
more extreme degrees. For example, the nation’s largest IP producers are known to have enormous reserves of retained earnings, with Microsoft, Alphabet (Google), and Apple each holding more than $100 billion in cash reserves as of the end of 2019.\textsuperscript{21} As shown in Panel A of Figure 2, the top five IP producers among the S&P 500 firms also consistently use the highest shares of their retained earnings to buy other firms through mergers and acquisitions. The same firms are also able to generate sales revenue two to three times the cost of goods sold, which we can use as a rough measure of firm-level market power.\textsuperscript{22} Similar plots (not shown) show that in recent years, pre-tax foreign income has grown to more than 15 percent of total revenue for IP producers, far more than other large firms, a fact that is consistent with studies showing that IP producers frequently use their IP to implement global tax avoidance strategies by relocating earnings to offshore shell companies, virtually eliminating their domestic tax liability in the process.\textsuperscript{23}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure2.png}
\caption{This figure shows the amount of cash used in mergers and acquisitions as a share of retained earnings (A) and total sales as a share of cost of goods sold (B) for three groups of firms within the S&P 500: the top five IP producers by patent portfolio value (green lines), the top five owners of conventional capital or property, plant, and equipment (blue lines), and of the remaining 490 firms, all firms who produce no IP whatsoever which I refer to as commodity producers (red lines).}
\end{figure}

\textsuperscript{23} Herman Mark Schwartz, “Wealth and Secular Stagnation: The Role of Industrial Organization and Intellectual Property Rights,” The Russel Sage Foundation Journal of the Social Sciences: New York 2, no. 6 (2016): For more on the tax benefits of these strategies, see Section 4 on Economic Inequality below.
Financialization of IP does not always benefit the companies that produce valuable IP. For decades, many top technology firms have lamented that the fungibility of IP means that non-practicing entities, including law firms and private equity firms, can earn huge sums by buying overlooked patents and then suing prominent technology companies for patent infringement. Even if the lawsuits have little merit, many profitable firms find it cheaper to pay “nuisance settlements” to avoid the high legal costs of vindicating their claims in court.\(^{24}\) estimate, for example, that total patent litigation costs approached $16 billion in 1999 alone. And as the Covid pandemic took root in the United States in March of 2020, one follower of the patent litigation trends even warned that, as the pandemic slowed global economic growth, we should “expect the chatter around [patent] litigation finance as a ‘recession-proof asset class’ to grow louder” as the industry was flush with new capital.\(^{25}\)

In these and other ways, the AKE’s reliance on IP seems to promote financialization in the American political economy. If we assume that financialization exacerbates inequality in conventional ways, the AKE may also exacerbate inequality through the same channels by diverting resources to forms of financial rent-seeking that do not generate productive investment, like patent litigation, or by multiplying the resources that IP producers have to engage in mergers and acquisitions and other kinds of financial behavior.

## 3 Geographic inequality

The AKE magnifies geographic inequality in a variety of ways and at multiple levels of geography. At the global level, many of the institutions of the global knowledge economy, in which the AKE is situated, arguably reproduce economic inequality between the global North and South by increasing the monopolistic rents that accrue to IP producers of wealthier nations while suppressing the economic and technological development of less developed nations. Consider the case of textbooks. 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 a political crisis that 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 knowledge economy development, all for the sake of maintaining a global cartel.\(^{26}\) Other examples, like Nelson Mandela’s experience trying to import patented HIV medication into South Africa, abound. They all point to possibility that the institutions of global knowledge economy keep less developed nations relatively impoverished.

The AKE also perpetuates a form of North-South divide within the United States and therefore


magnifies regional inequalities. As the Democratic Party turned towards the AKE in the early 1980s while also strengthening its ties to the environmental movement and severing its ties to organized labor, many elected officials in the Party became increasingly indifferent to the “smokestack” industries that were struggling to compete against companies backed by foreign governments abroad. Their indifference to the plight of American manufacturers and commodity producers had a concrete geographic bias: by 1980, decades of federal defense spending, right to work laws, and tax incentives precipitated a substantial relocation of traditional manufacturing from northern states to the southern Sunbelt. Democratic proponents of the AKE 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 and prioritized those regions where IP production predominated.

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.

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 public institutions that promote technological development in the United States have been so thoroughly depoliticized they have evolved into what Fred Block calls a “hidden developmental state”. 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.

Figure 3 indicates that this relationship is more than hypothetical. To produce the figure, I first calculated the share of per capita defense prime contract awards accruing to the top 210 core based statistical areas in the year 1960, which is plotted on the horizontal axis. These awards accounts for 86.7 percent of all defense prime contracts over $10,000 in that year. I then calculated each

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area’s per capita patent production from 2010-2015, which is plotted on the vertical axis, using subsequent citations to give more weight to patents that are more valuable. The blue line illustrates the line of best fit generated by running a linear regression of 2010 shares of patent value on 1960 shares of defense spending. As the figure reveals, these two values are highly correlated despite being separated by 50 years in time. It is worth noting that this significant relationship exists even in simple defense procurement data available to the public, data which does not include the substantial sums spent through other agencies, like the Atomic Energy Commission (which managed the nation’s federal laboratories at the time) and the National Aeronautics and Space Administration, or through defense spending that is not publicly available, like investments made by the Defense Advanced Research Projects Agency.

Figure 3: This figure shows the share of per capita prime contract awards from the Department of Defense in the year 1960 for each of 210 core based statistical areas (the horizontal axis) against the share of per capita patent value accruing to the same areas from 2010-2015 (the vertical axis). Areas with no patent value are excluded so that the data can be visualized on the logarithmic scale, but regression analysis (not shown) reveals that the omission does not materially change the results. The linear line of best fit is shown in blue.

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 proponents 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, minimized 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”.

4 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.

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) 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 increase in income inequality between counties from 1994 to 2000.34 Similarly, Aghion et al. (2019) 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.35 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.36 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.37 This result concretely connects suburban exclusivity, described above, with declining participation in the knowledge economy. Finally, Koh et al. (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.38

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 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. Figure 4 shows that concentration in the ownership of patents rose dramatically between 1935 and 2010. To generate the figure, I used IFI Claims patent data hosted on Google BigQuery, which has standardized names for the institutional owner of each patent including corporations and public entities. I excluded patents owned by individuals, aggregated the institutionally owned patents into portfolios by simply adding up new grants and depreciating prior patent value on

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a time scale of 17 years, and then calculated the share of patent portfolio value held by the top 1 percent. From 1945 to the early 1970s, concentration in the ownership rose rapidly, but political institutions—especially antitrust enforcers—counterbalanced this trend by forcing corporations to license their IP more broadly. A 1960 Congressional study found, for example, that from 1941 to 1959, antitrust officials procured 107 consent decrees forcing companies to license, in total, between forty and fifty thousand patents, including patents in key technological domains like semiconductors, computers, and synthetic materials.39

The political turn towards the AKE that began in 1980 caused domestic per capita patent applications to grow dramatically beginning around 1984, and since that time, concentration in the ownership of IP has continued to grow, as Figure 4 shows. What the figure does not show is that the political turn towards the knowledge economy eviscerated the antitrust institutions that worked as a countervailing force against rising concentration in IP ownership.40 Additional studies have found that the largest firms purchase substantial amounts (55 percent in 2010) of new patents by acquiring small emerging competitors (not accounted for in Figure 4) and that patent ownership since 2000 is strongly correlated with industrial concentration.41 Another troubling implication of these trends is that a small share of firms in a relatively small number of global regions are driving all IP production in the knowledge economy, a result which will inherently limit access to participation in the knowledge economy.

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.42 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 portfolio43 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, helps 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


43. Kogan et al., “Technological Innovation, Resources Allocation, and Growth.”
Figure 4: This figure shows the share of patents assigned to public and private institutions (excluding patents assigned to individuals) that are owned by the top 1 percent. When patents assigned to multiple entities, each entity receives an equal share.
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). 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. 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) also 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

45. O’Mara, The Code: Silicon Valley and the Remaking of America; Emily Chang, Brotopia: Breaking Up the Boys’ Club of Silicon Valley (Portfolio, 2019).
46. Kline et al., Who Profits from Patents? Rent-Sharing at Innovative Firms.
47. Bell et al., The Lifecycle of Inventors.
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.48

The theory has its skeptics.49 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 (see below), 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 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 Short (2021) argues, when trade negotiators agreed to subsidize
competition in commodity markets through the Generalized System of Preferences if developing
countries adopted stronger patent laws, they deliberately put the interests of IP producers and their
investors over the interests of domestic commodity producers.50 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. 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, 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) contend, for example, that the managers of IP producers lobbied heavily for two major changes in SEC regulations governing stock options in 1982 and 1991. Hacker and Pierson (2010) similarly contend that IP producers were responsible for defeating the Financial Accounting Standards Board’s first attempt to impose stricter accounting standards on stock options in 1995. And Omara (2019) argues that 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.

But the AKE’s most pernicious political outcome may be the way it isolates the working class. 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 affluent lawyers and knowledge economy professionals

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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 nominally supports unions but mostly 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 rising populism in the United States. But if any such connection exists, it arguably flows from the AKE’s institutional form, and not from a collective failure to acquire the skills needed to participate in the AKE.

6 Conclusion

To better understand the peculiar institutional form of the AKE, consider the legislative proposals of Paul Tsongas, one of the key entrepreneurial politicians or “Atari Democrats” that drove the political movement to reimagine the role of technological innovation in the American economy in the early 1980s. According to archival records, Tsongas put much of his legislative energy behind an Act to tax resource extraction on federal lands and create a $2.5 billion trust fund to increase the quality of science, technology, engineering, and mathematics education throughout the United States education system. The U.S. Congress passed his proposal, but only after whittling it down to a small two-year experiment with a $90 million appropriation. Tsongas also supported legislation to convene industry and academic panels, under the direction of the National Academies, that would identify and report to Congress about critical technologies the federal government should support, but the proposal saw no action after it was introduced. The same fate met Tsongas’ boldest proposal to create an Agency for Technological Innovation that would have conducted research on innovation policy and coordinated the government’s innovation strategy, thereby implementing the kinds of industrial policy that other nations like Japan and Germany practiced. In a time of divided government, these and other policies that envisioned an important role for the state in shaping the emerging knowledge economy met a swift political death. In contrast, Tsongas had success with proposals that reduced the antitrust liability for technology companies and a bill that created a federal venture capital program (known as the Small Business Innovation Research grant program) to address the “market failure” of limited equity investment in new companies or startups. The Democratic Party experienced similar failures, as a whole, but was tremendously successful in advancing legislation that strengthened domestic and global patents rights to rectify the “market failure” flowing from the ease with which new ideas are appropriated by companies that did not invest in their development.

Perhaps predictably, this neoliberal form of knowledge economy development has allowed

58. I use neoliberal here in the same sense used by Randall Rothenberg referring to those Democratic officials in the 1980s and 1990s who turned to economic analysis to identify ideal policies, who believed that the principal role of a political party was to generate economic growth, and who also believed that cooperation with the private sector was the
those regions with good IP infrastructure and those firms with valuable IP portfolios to play an increasingly important role in the nation’s economic transformation. Other aspects of the nation’s hidden developmental state have only exacerbated these trends, like the federal government’s preference for matching state investments and its meritocratic system of federal awards, both of which tend to compound existing advantages; its unwillingness to increase investments in higher education thereby reducing capacity and making a college education more expensive; its regressive commitment to financing primary and secondary education through local property taxes in a setting of increasing economic segregation which all but guarantees access to higher education to the children of the affluent; and its unwillingness to use antitrust enforcement or other institutions to check the power of the nation’s earliest winners in knowledge economy development. In these and many other ways described above, the institutions and policies of the American knowledge economy have plausibly contributed to and exacerbated the troubling socio-economic symptoms listed at the very beginning of this article. And as old institutions and policies are the problem, new institutions and policies are the cure.

References


key to doing so effectively given the government’s resource constraints.


