IS TECHNO-MONOPOLY INEVITABLE?

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Given the need to reward those who risk time and money on unproven ventures and ideas, there is often a tension between encouraging innovation and preventing monopolization in capitalist economies. The question is how to strike a proper balance in the face of immensely powerful technological and market dynamics.

CAMBRIDGE – The detective in a typical British crime procedural would say that Mordecai Kurz "has got form." An emeritus professor at Stanford University, Kurz received his doctorate in economics from Yale University more than 60 years ago. In 1970, he co-authored a book with Kenneth J. Arrow, a soon-to-be Nobel laureate in economics and among the greatest cross-over mathematician-social scientists ever.

Kurz would go on to establish a distinctive platform for criticizing John Muth and Robert Lucas's rational expectations hypothesis, demonstrating with rigor that any number of models could be mapped to the historical statistical record to reveal a spectrum of alternative "rational beliefs." And now, in his book *The Market Power of Technology: Understanding the Second Gilded Age*, he brings the same rigor to bear on the question of what shapes income growth and the distribution of wealth in an economy driven by privately owned technological innovations.

Kurz's theory of "technological market power" distinguishes legally sanctioned monopolies based on innovation from illegal conspiracies that restrain trade. He offers the example of General Electric, which exemplified the persistence of technological market power for a century, starting in the 1890s. An initial innovation that improves the innovator's competitive position creates market power which, in turn, generates monopoly profits that are invested in entrenching and extending the scope of market power. Moreover, those monopoly profits can and observably have been applied to influence the extent to which the political process can counter the accumulated market power.

Kurz challenges the view that any monopoly based on technology will be necessarily transient, subject to the Schumpeterian process of "creative destruction." Once market power becomes entrenched, he argues, targeted state interventions become the only means of restoring meaningful competition. Accordingly, Kurz proposes a radical program of reforms to disestablish market power where it exists and minimize the risk of its recurrence.

Yet the feasibility of such responses would appear to be limited by the monopolists' immense political power in the United States. Their reach extends even beyond electoral and legislative politics to encompass the judiciary: consider the success of the Federalist Society in establishing an ideological basis for pro-business, anti-regulatory jurisprudence. As Kurz himself is aware, tackling technological market power will require a sea change in American politics.

Kurz's book is a profoundly significant contribution to a growing body of political-economy literature (including some of my own work) that seeks to make sense of the complex, potentially contradictory dynamics of democratic capitalism or capitalist democracy (you choose the order). His work is distinctive in several ways.

First, he offers formal mathematical models to express the logic of his argument and to interrogate historical data. Second, his analysis allows him to furnish deterministic conclusions, such as his main argument that the historically observable "permanence" of market power results from how technology and capitalism intersect. And third, he arrives at quite radical conclusions about what is needed to counter market power.

There is no need to recount in detail how Kurz develops his thesis. He himself has translated the arguments for a nontechnical audience in a series of *Project Syndicate* commentaries. He is ultimately addressing observable facts of economic, technological, and political life. That said, four areas of his analysis warrant closer attention.

First, his quantified profile of the trajectory of monopoly profits occasionally fails to map precisely with the political history that he invokes. Second, he pays scant attention to the financial dimensions of monopolizing incumbents' behavior. Third, in his analysis and in his proposed reforms, he paints a simplistic picture of the tension between the expected profits that incentivize investment in innovation and the power that realized profits confer on successful innovators, while treating research and development, and the innovations it generates, as a homogeneous amalgam. And fourth, his attack on Schumpeterian growth theory targets a straw man that both Joseph Schumpeter and later scholars abandoned long ago.

Kurz gives us a history of technologically derived market power from the end of the nineteenth century onward, deploying formal models to distinguish monopoly profits – the returns to market power – from the returns to physical capital and labor. In this calculation, all the output of R&D – patents, software, intangible assets – is deemed to be both the source and a consequence of market power. Capitalized in the stock market, monopoly profits (extended to include stock-based executive compensation) become quantifiable monopoly wealth.

Kurz then uses the rise and fall of monopoly profits and wealth to trace the rise and fall of market power derived from technological innovation. But what about the anomalous increase in calculated value throughout the Great Depression? Reported corporate profits turned significantly negative in 1931-33, before recovering in 1934-37, only to plunge again in 1938. To explain this, Kurz cites President Franklin D. Roosevelt's establishment in 1933 of the National Recovery Administration, which offered a misguided, business-friendly path to recovery through cartelization. But the NRA was never fully deployed, and the Supreme Court struck it down in 1935 (a decision that saved the New Deal from substantial embarrassment).

Kurz offers a second explanation which has more bite. He suggests that in the face of such trying economic circumstances, only the most efficient firms survived and could participate in the productivity surge brought by the electrification of manufacturing. Still, this is but one example of the problem with trying to apply formal models to lived history.

Another arises when Kurz identifies the end of the first Gilded Age with Theodore Roosevelt's assumption of the presidency in 1901. While the 20 years of the Progressive Era did bring "trust-busting" and constitutional amendments to establish the income tax and the direct election of senators, it also featured a Supreme Court decision – in *Lochner v. New York* (1905) – that elevated "freedom of contract" above the power of either the federal or state governments to regulate business. Moreover, it was soon followed by the extremely pro-business administrations of Warren Harding, Calvin Coolidge, and Herbert Hoover.

Nonetheless, in his attempt to construct a quantitatively informed history of the American political economy, Kurz's analysis of monopoly profits is provocative. He poses the existence of returns to market power against the returns to the factors of production in the neoclassical production function: capital and labor. Here, the return to capital is the cost of obtaining the physical plant and equipment needed for production, while the return to labor is the wage.

At the end of the nineteenth century (the first Gilded Age), monopoly profits skimmed returns from each category, according to Kurz's calculation. But owing to the later New Deal reforms, which offered some protection to labor, Kurz concludes that the owners of capital have suffered relatively more than workers from the resurgence of monopoly profits since 1980. Given the stagnation of real (inflation-adjusted) median wages over the same period, this finding comes as a surprise.

Kurz points to another factor that needs to be considered: the rise and fall of private-sector unions as potential sources of countervailing power against technologically empowered monopolists. He begins, however, on a misleading note when he asserts that "progressive policy … supported the rising power of labor unions." Though there were efforts to unionize industrial workers during the years of extreme labor shortage during World War I, these gains were not consolidated. The Great Steel Strike of 1919 was utterly broken by the final year of Woodrow Wilson's supposedly progressive administration. Then, from the New Deal onward, income inequality did correlate inversely with the share of US households with at least one union member.

However, that figure has fallen from almost 50% between World War II and the 1950s to no more than 15% in the past decade. Recent union successes, from General Motors to Starbucks, offer some hope for revival of these strategically crucial institutions. The fact that they have occurred in the context of an explicitly union-friendly administration supports Kurz's argument that only the power of the state can counter the market power of technology.

CHOICES, CHOICES

The executives at the top of technologically empowered monopolies always have choices about how to allocate cashflow, whatever its source. In focusing on how such profits are invested in entrenching and extending market power, Kurz neglects two contrary alternatives. First, the business units exploiting established market power compete for incremental resources with investments to explore the potential of new technologies.

As a "friend with intellectual benefits" at Palo Alto Research Center from the start of the 1980s, I watched Xerox, PARC's parent company, repeatedly reject business plans to take the lab's phenomenal inventions to market. In doing so, it was unwittingly neglecting a unique opportunity to lead the personal-computer revolution. The problem was that PARC, a high-risk venture, had to compete with the near-certain returns from investing equivalent sums in extending Xerox's patent-protected copier business (for example, by hiring more salespeople or field engineers).

Something similar happened to IBM. By the end of the 1980s, it had been the dominant force in digital computing for a generation, and it was continuing to build on its previous monopolistic position in calculating machines. But the company and its trailing competitors were all locked into vertically integrated, closed, proprietary systems that were entirely incompatible with one another. From the software that managed the physical computer to the software that delivered applications to customers, everything was coded in each company's unique format and language.

For a while, this approach ensured a steady flow of monopoly profits, because customers were locked into their suppliers' environment. By the early 1980s, however, a radically different architectural vision began to take hold. Standard languages and protocols began to move

from academic labs to the new breed of venture-capital-backed startups, many of them sponsored by the US Department of Defense. Initially, these networked "client/server" systems addressed niche scientific and technical markets. But to anyone who was paying attention, their potential to compete in the vastly larger commercial markets dominated by IBM had become apparent by 1990.

IBM's leaders were not among those who were paying attention. In August 1988, the company introduced the apotheosis of its proprietary technology, the AS/400. By the end of 1990, it had shipped 110,000 systemsand generated at least $14 billion in revenue and $10 billion in free cash flow. Within the company, no higher-risk venture into the new world of distributed computing had any hope of receiving substantial support from senior management.

That meant the road was open for VC-backed startups to exploit the fact that local area networks were morphing into wide area networks – a major step toward the emergence of the internet itself. At the VC firm Warburg Pincus, I spent the 1990s pursuing a wide range of investment opportunities that sought to accelerate IBM's loss of control of commercial computing. This kind of endogenous negative feedback loop, where an entrenched incumbent is diverted from investing in the innovations that may challenge its market power, lies beyond the scope of Kurz's work.

So, too, does the other alternative use of surplus capital: buying back outstanding shares of the company's stock. Prior to 1982, the US Securities and Exchange Commission barred share buybacks, viewing the practice as a potential form of market manipulation. But a rule change that year legalized the practice, and it has since become widespread. In 2022, the most recent full year for which data are available, S&P 500 companies bought back $923 billion in stock, far outstripping business funding of R&D that year, which the National Science Foundation estimates totaled $673 billion.

The financialization of corporate decision-making was not the only factor in the demise of the great industrial research laboratories (AT&T's Bell Labs, IBM's Yorktown Heights, RCA's Sarnoff Labs, and DuPont Central Research). But as Kurz does note, the process was amplified by the rise of equity compensation for executives, and by the elevation of stockholder value as the sole criterion for evaluating corporate policy.

The irony is that Kurz's iconic example, GE, was effectively destroyed by the personification of this doctrine, Jack Welch, whose concentration on financial services both enabled manipulation of reported earnings and exposed GE to the 2008 global financial crisis. More recently, the decline and continuing fall of Boeing demonstrates the consequences of financialization for a former technological leader.

WHY INNOVATE?

Investing in innovation means investing in the unknown. There is not only technology risk ("When you plug it in, does it light up?"), but also market risk ("If it lights up, will anyone care?"). What would motivate a firm to undertake such investments? The prospect of monopoly profits, of course. These can be supported, at least for a while, by legal patents, the effective enforcement of trade secrets, or monopolistic market power.

In Kurz's analysis, the persistence of market power transcends the life of any one monopolist, long as that life may be. The crucial insight is that innovation relies on the *permanent* availability of market power as the needed incentive for investing in R&D in the first place.

Kurz recognizes that the emergence of a new "general purpose technology" such as electrification, the internal combustion engine, or computing can re-level the playing field and open up competitive opportunities for new entrants. But incumbents can renew themselves during such moments, provided they resist the negative incentives that destroyed IBM and Xerox as technological leaders. Hence, in a December 2023 *Project Syndicate* commentary, Kurz offers evidence that 25% of all the monopoly wealth capitalized in the US stock market in 2019 was created by firms more than 100 years old.

There is, however, contrasting evidence of turnover at the top of the corporate hierarchy. Six years ago, McKinsey & Company reported that, "In 1935, the life expectancy of an S&P 500 company was 90 years. By 2010, it was 14 years." Currently, of the 30 constituents of the Dow Jones Industrial Average, 22 were added after 1990. In recent decades, the rise of professional VC has had a major impact: 88 of the top 300 US companies by market capitalization, all founded after 1980, have been backed by US VC funds. In 2020, VC-backed US companies accounted for $244 billion in R&D spending, 46% of the national total across public, private, and academic sectors.

Moreover, the ability of firms to appropriate the returns on their risky investments is limited. More than 60 years ago, Arrow and another renowned economist, Richard Nelson, made complementary theoretical cases that, as a non-rivalrous good, information generated through research will inevitably leak out and be exploited by competitors. More recent research finds that the social returns from R&D spillovers exceedthe private returns captured by the investing firm by more than fourfold. In other words, there is a tension (in some ways positive) between the incentive to innovate and the consequences.

In his book, Kurz conducts model-based simulations to explore the dynamics of R&D investment, productivity, and monopolization. He shows that high productivity is a function of the stock of R&D, which (in the absence of government intervention) enables incremental private investment in innovation to increase the degree of monopoly without limit.

The implication is that the state should establish a strict limit on the share of the national R&D stock that any one firm can own; at that limit, incremental R&D by the firm is banned. This is the most radical of the reforms that emerge from Kurz's modeling, even though it

is not actually included in his chapters on specific policy reforms.

His other proposals include changes to patent and antitrust laws, to address, respectively, competition-destroying "patent thickets" and acquisitions by market leaders of potential competitors. But such reforms could have unintended consequences. For example, an effective ban on acquisitions by the tech giants would feed back into the world of VC and startup entrepreneurs. Kurz is quite right that the four-decade-long suspension of antitrust enforcement after the start of the Reagan administration enabled tech leaders to acquire hundreds of firms, including potential competitors, thereby contributing to their entrenchment as market leaders. But there is another side to this coin.

After all, willing buyers must find willing sellers. Some 80-90% of successful exits by VCs are realized through the sale of the business to other, larger firms. The prospect of acquisition is thus a dominant incentive for funding startups, including those that commercialize scientific advances in university laboratories. Closing this channel of returns for entrepreneurs and those who finance them is bound to hamper innovation.

Kurz also proposes tax reforms that would distinguish between returns to physical capital and the monopoly rents that market power generates. Here, he is plainly aware of the negative effect that such a tax on the rewards for successful innovation may have on future investment in R&D.

Finally, as a direct attack on the extreme inequality of wealth in the US, he proposes to operationalize the Second Welfare Theorem. This fundamental theorem of welfare economics characterizes the most socially efficient solution in a competitive economy to be an outcome where the winners can compensate the losers (though they rarely do, historically). To that end, he would levy a temporary wealth tax to finance a National Fund for Equity and Democracy. This would be tantamount to a giant sovereign wealth fund, the returns of which would go toward health and education programs and state-funded R&D.

WHICH SCHUMPETER?

That brings us to Kurz's attack on Schumpeterian thought. Here, he directs his criticism at a slogan – creative destruction – rather than at Schumpeterian Growth Theory in its more mature and evolved form. He attacks Schumpeter's original formulation of his theory of economic development as it appeared in 1912, when Schumpeter identified the entrepreneur as the engine of creative destruction:

"The fundamental impulse that sets and keeps the capitalist process engine in motion comes from the new consumer goods, the new methods of production and transportation, the new markets, the new forms of industrial organization that capitalist enterprise creates… This process of Creative Destruction is the essential fact about capitalism… We will assume that innovations are always associated with the rise to the leadership of New Men."

This version is generally referred to as "Schumpeter Mark I." But in 1942, Schumpeter proposed a very different model, one that in fact anticipates Kurz. According to "Schumpeter Mark II":

"Technological progress is increasingly becoming the business of teams of trained specialists who turn out what is required and make it work in predictable ways… *The perfectly bureaucratized giant industrial unit not only ousts the small or medium-sized firm and 'expropriates' its owners, but in the end it also ousts the entrepreneur…*" (emphasis mine).

Moreover, Kurz might be pleased to learn that Philippe Aghion of the London School of Economics and Peter Howitt of Brown University, the leading Schumpeterian thinkers for the past 30 years, recently assessedthe state of the US economy and found that market leaders may indeed be so far ahead as to chill any challengers. While affirming that under conditions of "neck-and-neck" competition, market leaders will follow their incentives to compete vigorously, Aghion and Howitt echo Kurz in pointing to cases "where a successful incumbent escapes competition from potential rivals by using its wealth and power to block or nullify innovation by those rivals through various economic and political means."

They then proceed both to specify the means whereby market leaders suppress competition – namely, with tactics strikingly similar to those Kurz describes – and to cite the growing body of empirical research identifying this dynamic in the US economy.

Nor has the evolution of the Schumpeterian model stopped there. A new "Schumpeter Mark III" framework focuses on the "division of innovative labor" (as documented by scholars at Duke University) that has become a central engine of the US innovation economy. The key insight is that not all R&D is the same, and not all innovations are of one homogeneous type. There is a substantial academic literature on the distinction between "exploration" and "exploitation" R&D. The former describes the typical focus of small, growing firms, whereas the latter describes the domain of incumbents.

Thus, according to a 2022 working paper, patents obtained by startups "are approximately 40% more likely to be 'outlier inventions' in the top 5% of the citation distribution." Moreover, a 2023 paper finds that when incumbents recruit inventors from young firms, the inventors' productivity declines as their compensation increases:

"Taken together, these estimates suggest inventors employed by and those hired by incumbents, relative to those at young firms, have higher earnings and lower inventive output, fewer applications, fewer citations and citations per application, patents with more limited scope, and a higher self-citation rate."

In this context, it is noteworthy that the term “venture capital” does not appear in the index to Kurz’s book.

BE REALISTIC, DEMAND THE IMPOSSIBLE

Kurz’s work on the market power of technology is deeply researched and rigorously developed. His methods of bringing together theory and data are powerful and often compelling, as is his argument that an economically engaged state remains the only source of countervailing power against technologically entrenched monopolists. The sheer radicalism of his proposed reform agenda follows directly from this conclusion.

Under President Joe Biden’s administration, some of his proposals might even be possible, not least stronger enforcement of existing antitrust laws. Moreover, his analysis will help to challenge the “law and economics” doctrine that is consistently drummed into law students (with much support from the Federalist Society). But the likelihood of his agenda creating negative feedback for startup innovation warrants closer consideration.

In any case, most of his proposals lie beyond the current “Overton window” of political acceptability. Even relatively modest patent-law reforms to limit the life of “secondary” and acquired patents to half of the current 20-year life seem unlikely to make any headway.

While there are some precedents for Kurz’s proposed tax increases, they reach back to the extreme conditions of the Great Depression and WWII, though marginal income taxes at the highest bracket did persist above 50% well into the 1980s. For his part, Biden’s proposal to make corporations and wealthy Americans “pay their fair share” would merely return the top rate from 37% to 39.6%, where it was before the Trump administration’s 2017 tax cuts.

Enacting even these changes (as well as closing loopholes) would require not just Biden’s re-election but also solid Democratic majorities in both chambers of Congress. Regardless of the socially beneficial expenditures to be financed by Kurz’s national fund, the wealth tax proposed for underwriting it is politically unimaginable in today’s US.

But to say that Kurz’s proposals are currently unrealistic may be missing the point. Such radicalism underscores the power of the techno-economic engine that it analyzes and attacks. Making that power a topic of public debate is the first step toward shifting the Overton window of acceptable government policies and letting in some fresh air.

Mordecai Kurz,* The Market Power of Technology: Understanding the Second Gilded Age*, Columbia University Press, 2023.