On July 2nd, 1865, Sylvia Ann Howland died. She was said to be the richest person in the whaling village of New Bedford at the time, controlling an estate worth over $2 million. Less than three weeks prior, her former partner in the whaling business, Edward Robinson, also passed, leaving an estate worth nearly $6 million. Set to inherit this entire sum was just one person: Hetty Robinson, niece of Sylvia, daughter of Edward.

Hetty did indeed receive much of her family’s fortune—but not the entirety, as she claimed was her due. Sylvia’s will, written in 1863, bequeathed roughly half the $2 million estate to various individuals and corporations and placed the rest in a trust benefitting various Howland descendants. But Hetty produced an earlier “mutual” will signed in secret in 1862 by Sylvia and Hetty and three witnesses leaving Sylvia’s entire estate (minus $100,000) to Hetty. More importantly, this earlier will contained a secret second page signed only by Sylvia and Hetty “revoking all wills made by me before or after this one . . . to shew, if absolutely necessary to have it, to appear against another will found after my death.” Obviously, if the second page was genuine, this would mean the 1863 will granting Hetty only half the estate was obsolete.

The case went to court. On one side, Hetty claimed Sylvia had become estranged from her brother-in-law Edward Robinson and drew up this secret will to keep the Howland fortune from his family’s hands. On the other side, the Howland estate claimed the signatures were forgeries, copied by Hetty to secure an even larger inheritance for herself. The case thus turned on the veracity of Sylvia’s signature on the two copies of the secret second page of the 1862 will, and the trial saw over a dozen “experts” from both sides weigh in.

One of these experts was Charles Pierce. The evidence he provided against Sylvia Howland’s signature resulted from a meticulous analysis of over 25,000 comparison points of 42 of Sylvia’s previous signatures—the type of work people in the 19th century called “computing.”

Pierce planned to determine the likelihood Sylvia’s signatures on the second page of the will were forged copies by analyzing how closely they matched the signature on the first page of the 1862 will, which both sides agreed was genuine. He’d do this by counting the number of “coincidences” occurring between the 1862 signature and the 42 additional Sylvia signatures he had from other documents (basically, coincidences were the number of times a downstroke of the pen began in an identical place). Each signature had 30 downstroke positions to analyze.

To make a long story less long, Pierce counted 5,325 coincidences out of a possible 25,830 cases when comparing the 1862 signature to the other 42—in other words, one out of every five downstroke positions overlapped. Yet both signatures on the two copies of the second page coincided with the public first page of the 1862 will in all 30 positions. The likelihood of such a perfect match occurring by chance, Pierce said, “transcends human experience. . . . [It] is utterly unreasonable to attribute this coincidence to any cause but design.” The signatures were forged; Hetty copied them to increase her inheritance. Case closed.

Well, case closed, but not on account of Pierce’s evidence. The Howland estate did triumph over Hetty Robinson, but on a technicality, not as a result of Pierce’s testimony. I tell this story anyway (covered in greater detail in Louis Menand’s Pulitzer Prize winning book, “The Metaphysical Club”) because it distills what technology at its core is about: productivity improvements. What took Pierce untold hours can now be accomplished in snap. The computers of the 1800s and the computers of today share a name, but little else—a banal point, I know, but an important one for my argument.

It is not just technological progress in the abstract that we can thank for our efficiency gains, but specifically Big Tech—the large firms like Apple, Amazon, Google, Facebook and others so suddenly scorned today. Despite the claims of skeptics who say these firms produce little more than “time-sucking frivolity,” Big Tech produces products and services that people greatly value as well as generating high-paying jobs and considerable wealth. And if we hope to enjoy in the future the advances in living standards that we have benefitted from in the past, America’s successful technology sector will continue to be a critical factor. As such policymakers should be exceedingly careful when regulating the industry through new rules or antitrust action.

The central challenge for advanced economies in the 21st century is vanishing economic growth, driven by both slowing demographics and stagnating productivity. It hardly goes too far to say that policymakers should almost always consider how their actions might affect innovation and productivity growth. For most of the postwar era, half of real GDP growth came from an expanding workforce and half from increasing worker productivity. In the future, productivity will have to do most of the heavy lifting. For the American economy to grow anywhere near as fast in the future as in the past will require rapid productivity growth.

This won’t be easy. And the pessimistic case is persuasive and perhaps most ably argued by economist Robert Gordon. In [*The Rise and Fall of American Growth*](https://www.amazon.com/Rise-Fall-American-Growth-Princeton/dp/0691147728), Gordon describes a “special century” of fast productivity growth from roughly 1870 to 1970. But the apogee of that period was really the 1920–1970 “golden age” period; the Second Industrial Revolution of the second half of the 19th and early 20th century really supercharged the American economy. That second wave generated important and unrepeatable inventions flowing from five key technological advances: electrification, the internal combustion engine, chemicals, modern communication, and urban sanitation infrastructure. Compared to these “great inventions,” in Gordon’s view, the impact of information technology is relatively insignificant. At least for the foreseeable future, the era of fast growth is over.

A similar “great stagnation” thesis is put forward by economist Tyler Cowen: The economy’s low-hanging fruit are gone, we’ve already found them, eaten them, and benefitted from their nutrients, and new fruit is increasingly hard to come by. A paper from Stanford economist Nicholas Bloom and his co-authors—titled “Are Ideas Getting Harder to Find?”—lays out the evidence. Just to maintain our current overall rate of economic growth, the economy has to double its research efforts every thirteen years.

So assuming one favors faster growth and higher living standards—and there are some tech opponents who downplay the importance of these things—what one is really saying is that the American economy needs to be more like Silicon Valley. For instance: A recent Commerce Department [study](https://www.bea.gov/digital-economy/_pdf/defining-and-measuring-the-digital-economy.pdf) finds the $1.3 trillion digital economy—including hardware, software, ecommerce, and digital media—grew at an average annual rate of 5.6 percent over the past decade compared to 1.5 percent growth in the overall economy. Moreover, the jobs being generated by all that growth tend to be good ones with average annual compensation of $114,000, nearly twice the U.S. average. And Big Tech, with a combined market capitalization of some $3 trillion, has been at the sector's leading edge, generating growth and innovation in the internet economy. There is a good reason why China is eager to create its own tech giants, and Europe continues to wonder why it cannot create its own.

And let’s be clear about the value of the goods and services the American tech sector produces, especially in light of calls that consumers should be paid for the data when they use free services such as Google search or posting on Facebook. In the new working [paper](http://www.nber.org/papers/w24514), “Using Massive Online Choice Experiments to Measure Changes in Well-being,” economists Erik Brynjolfsson, Felix Eggers, and Avinash Gannamaneni run an experiment where they “only ask consumers to make a single choice among two options: Whether to keep access to a certain good or to forego the good in return for a specific amount of money. We only ask one question per consumer and vary the price points systematically between consumers.” The results suggest consumers would need to be paid $40-$50 per month to leave Facebook, nearly $4,000 annually to abandon Google or Apple maps,  more than $8,000 to skip emailing, and a whopping $17,530 to accept losing access to internet search.

Tech critics will also look at the years of slow productivity growth and wonder why all these advances aren’t creating faster growth. How come we don’t see Google and Amazon and Apple boosting the broader economy outside of Silicon Valley and Seattle and Boston? What is the point of letting these companies become more powerful and intrusive into our everyday lives—and suffering the occasional privacy breach or election interference from foreign powers—if the gains aren’t more broadly shared? Maybe Gordon is correct in his techno-pessimism.

But there is an optimistic case. Maybe a future of higher innovation, productivity, and growth is already here—it’s just not evenly distributed. Researchers Erik Brynjolfsson, Daniel Rock, and Chad Syverson offer some good news in [“Unpacking the AI-Productivity Paradox,](https://sloanreview.mit.edu/article/unpacking-the-ai-productivity-paradox/?utm_source=twitter&utm_medium=social&utm_campaign=sm-direct)” an article in the MIT Sloan Management Review. There’s good reason to believe artificial intelligence could be an important general-purpose technology like electricity and the internal combustion engine that helped make Gordon’s Special Century. BRS find no “inherent inconsistency” between that optimism and Cowen’s “great stagnation.” It can take a long time for innovation in areas of the economy to spread to other areas and become efficiently used. It’s a story that we’ve seen play out in the past, most notably with factory electrification, where it took decades to reorganize the workplace around electric motors. As they write in the paper:

*It takes considerable time — more than is commonly appreciated — to sufficiently harness new technologies. There are numerous cases where we see a lag between tech achievements and economic impact. Retailers’ recent experience with e-commerce is a good example. The e-commerce excitement of the 1990s was prophetic, but it took nearly two decades — until 2017 — for online business models to approach 10% of total retail sales. The sector as a whole required the* [*build-out of an entire distribution infrastructure*](https://sloanreview.mit.edu/article/how-to-win-in-an-omnichannel-world/)*. Customers had to be “retrained” to buy online. Organizational inertia held back innovation in business processes, supply chains, and product selection. None of the needed changes happened overnight, even though the* [*potential of e-commerce to revolutionize retailing*](https://sloanreview.mit.edu/article/using-analytics-and-ai-subscription-e-commerce-has-personalized-marketing-all-boxed-up/) *was widely recognized, and even hyped. The actual share of online commerce was a miniscule 0.2% of all retail sales in 1999. Only now are companies like Amazon.com Inc. having a first-order effect on more traditional retailers’ sales and stock market valuations.*

*Self-driving cars, medical applications of machine learning, and many other AI breakthroughs will likely follow a similar trajectory. As a GPT, AI will ultimately have an important effect on the economy and public welfare. At the same time, profound and far-reaching restructuring requirements will continue to prolong how long it takes to see the full impact on the economy and society.*

*What’s more, and what business leaders may find most relevant, is that the required adjustment costs, organizational changes, and new skills can be modeled as intangible capital. A portion of it is already reflected in the market value of companies. However, going forward, national statistics will need to be reinvented to measure the full benefits of the new technologies and their true value. Realizing the payoffs of AI is far from automatic and will require more fundamental changes than many executives typically imagine.*

Think about the role tech companies are playing in making this future happen. Tech companies spend more on R&D than any other companies in the US. Amazon alone spent $23 billion on R&D last year; that’s greater than the GDP of more than 100 different countries.

But of course investment doesn’t come from the tech companies only—or at least it doesn’t all come from the tech companies directly. It also comes from venture capitalists out in the valley, many of whom are flush with cash largely because of Big Tech. As Stanford economist Bloom puts it, “Venture capitalists have just unbelievable amounts of money to fund every startup in sight. And the reason they’re doing that is they’re looking ahead and they’re seeing their startups potentially being funded by or bought up by Facebook or Google.”

Critics point to this behavior as evidence Big Tech suppresses competition by buying up potential competitors. But the opposite case seems just as if not more plausible. In addition to providing an exit ramp for potential investors, in the long run, says Bloom, “it’s throwing gas on the fire of innovation because it’s throwing money into the system and encouraging the next wave of innovators.” In short, “we’re much better off with strong, massive R&D-spending firms like Google than without them.”

Of course, this is only dealing with innovation in the abstract. The particulars are even more exciting. As competition scholar Nicolas Petit [puts it](http://bruegel.org/wp-content/uploads/2016/10/Tech-Giants-The-Moligopoly-Hypothezis-and-Holitic-Competition-A-Primer-PETIT-20-10-16-1-1.pdf), all the tech giants share “the ambition to discover the next transformative technology, and become the ultimate 21st-century disruptors in the footprints of the Henry Ford, Nikola Tesla, and Leonardo da Vinci.” The iPhone is one example. Perhaps the next will be autonomous vehicles, with the potential to bring trillions of dollars of savings and prevent millions of unnecessary deaths. Advances in artificial intelligence promise to improve diagnoses and medical procedures, again saving money and lives simultaneously. With betters tools and more minds coming online thanks to the internet and globalization, who knows what advances are ahead?

In other words, the private sector—as it has in the past and will in the future—is helping sow the seeds for sustained productivity and economic growth. The last thing we need is an overzealous political class trying to prematurely uproot them. And yet that is in many ways what our political class seems to want to do. Increasingly the most vocal objection to the tech titans is that monopolistic Big Tech suppresses competition (as the left charges), hurt innovationing, or stifles free speech (as the rights accuses).

But despite rampant concerns to the contrary, these tech titans are hardly forever dominant monopolies. To label Twitter one drains the concept of its meaning: The platform’s monthly active users is [falling](https://www.nytimes.com/2018/07/27/technology/twitter-stock-earnings.html), and attempting a popular-on-Twitter joke in public never fails to highlight how insular the service is. Facebook too is seeing falling popularity among young Americans, suggesting its monopoly status—such as it is—will perhaps be short-lived.

And while Google theoretically could use its utter dominance over internet search to bury conservative viewpoints beneath pages of non-conservative search results, to suggest it is doing so now or is close to doing so in the future borders on paranoia. President Trump’s claim that Google suppresses positive news coverage, for example, [stems entirely from](http://theweek.com/articles/792776/trump-searches-justice) a single non-scientific study by a writer at Trump-friendly PJ Media, a study which equates “left-leaning” Reuters, Bloomberg, and the Washington Post with the “right-leaning” Breitbart, Drudge Report, and InfoWars. If there is bias, it’s one in favor of news sources that produce lots of content that gets linked to a lot and shared a lot. And that means traditional mainstream media rather than newish right-wing websites such as Infowars. Google’s dominance over search is if anything a testament to its own perceived fairness and trustworthiness.

The critiques from the left are hardly more persuasive. A recent long [New York Times essay](https://www.nytimes.com/2018/02/20/magazine/the-case-against-google.html) emblematic of many of these jeremiads fails to make the data-driven case for the sort of significant or systematic suppression of competition—leading to less innovation—that might justify some sort of new rationale for broad action. For instance: US productivity growth downshifted before the Era of the Megaplatforms. Many new fast-growing tech firms continue to be created, thanks in part to the services these digital platforms provide. And even in the area of search, Google has competitors, including Amazon’s 50 percent share of all shopping searches.

What’s more, we have no idea how the emergence of new technologies will affect business models and business sustainability. In “Debunking the ‘Network Effects’ Bogeyman,” David Evans and Richard Schmalensee note “the collection of dead or withered platforms that dot this sector, including Blackberry and Windows in smartphone operating systems, AOL in messaging, Orkut in social networking, and Yahoo in mass online media.” (Indeed, when the media isn’t describing how all-powerful these firms are, they are hyping various existential threats to them.) Why take preemptive action, with little evidence of current harm, against companies that the EU and China would love to call their own? Remember when we were supposed to break up forever-dominant Walmart?

Indeed, actions to regulate Big Tech may actually cement the advantage of their incumbency. Europe’s Global Data Protection Regulation is a framework that U.S. activists have been pointing to as a model for what Congress might consider applying here in America. Yet the result might be to strengthen the very companies it is trying to tame. Limiting the flow of data gives an edge to Big Tech companies that already have loads of data and a massive user base.  A recent Wall Street Journal piece, [“Google and Facebook Likely to Benefit From Europe’s Privacy Crackdown,”](https://www.wsj.com/articles/how-europes-new-privacy-rules-favor-google-and-facebook-1524536324)  arrives at a similar conclusion: “Big tech companies gain while smaller online ad firms are squeezed under the European Union’s GDPR.”

I began with a story of 19th century computing. We’ve progressed quite a bit since then; none of tech’s critics would deny this. The more relevant question asks whether the current constellation of Silicon Valley’s firms are conducive to further progress.

The outsized confidence of a vocal minority of antitrust activists notwithstanding, the answer is yes. All participants in this conference ostensibly want the same thing: to see U.S. economic growth return to its post-war pace. The question is how to get there, and the choice presented today is whether Big Tech helps or hinders us. I hope to have convinced you today of the former.