When Big Tech Become Systemic

Big Tech is not systemic because of its size, but because the economic, financial, political and social order has reorganised itself around its infrastructure, its data and the expectations it generates, without an equivalent framework of governance. This is not merely a technological phenomenon, but an economic logic advancing faster than society's capacity to understand it, regulate it or meaningfully consent to it democratically.

The uncomfortable image

"Size, we are told, is not a crime. But size may become noxious by reason of the uses to which it is put."

Louis Brandeis wrote those words more than a century ago in Other People's Money: And How the Bankers Use It (1914), his critique of the financial concentration and industrial trusts that dominated early-twentieth-century America. At the time, large banks and sprawling industrial trusts in railroads, steel and utilities had accumulated extraordinary economic and political power. Brandeis's concern was not size per se, but what size does to markets, democracy and accountability. Today, those words apply with unsettling precision to the largest technology firms in the world. Nvidia is now valued at roughly USD 4.5 trillion; a scale comparable to the annual economic output of Germany or Japan, and several times larger than the market value of the world's most systemically important banks. Apple, Microsoft, Alphabet and Amazon follow close behind. This is no longer a story about innovative companies outperforming their peers. It is a story about private firms operating at a macroeconomic scale. When a handful of corporations concentrate not only market capitalisation, but also global investment flows, digital infrastructure and economic expectations, scale itself ceases to be neutral.

The issue is no longer whether success is deserved, but what such concentration does to the functioning of markets and institutions. Over the past two decades, technological change has reshaped not only markets but the distribution of information and knowledge. Control over data, once a by-product of commercial activity, has become a central source of economic power. Much of the criticism directed at today's technology giants originates in this transformation. Their business model rests on decades of largely unchecked collection and monetisation of private data, generating powerful network effects and entrenched market positions. These dynamics allow a small number of firms to exert considerable influence over

prices, access and competition, while aggressive profit-shifting and offshore structures have enabled them to minimise corporate tax liabilities across jurisdictions.

From a financial-stability perspective, however, the issue now goes beyond competition or taxation. Big Tech firms have become deeply embedded in the financial system itself. Banks, insurers and market infrastructures increasingly rely on their cloud platforms to operate critical functions, from payments and online banking to data storage and risk management. As financial activity migrates onto privately controlled digital infrastructure, operational dependence is quietly turning into systemic exposure. At that point, the question is no longer whether these firms are simply large. It is whether they have become too central to fail.

The automation of belief

What makes this concentration particularly resilient is that it is not driven solely by conviction or optimism, but by market structure. Over the past two decades, a growing share of global savings has been channelled into passive investment vehicles, pension funds, index funds and retirement plans that allocate capital automatically. In these portfolios, weighting follows size: the larger a company becomes, the more capital it attracts by construction. This creates a self-reinforcing dynamic. As prices rise, index weights increase; as weights increase, new inflows are mechanically directed toward the same firms. The result is not simply that investors "believe" in Big Tech, but that capital is continuously allocated to it regardless of individual judgment. Concentration, in other words, is no longer an outcome. It is a feature of the system.

The new nature of Big Tech

Like many economic frictions before it, the concentration we observe today has been triggered by a technological shock; a shift in paradigm rather than a market accident. The digital revolution has altered the foundations of economic organisation in ways that standard models struggle to capture. Classical political economy revolved around land, labour and capital. Today, data could have emerged as a fourth factor of production, one that does not obey the familiar rules of scarcity, diminishing returns or competitive allocation. Data is non-rival, accumulative and characterised by increasing returns to scale. As a result, the conditions that underpin perfect competition, price-taking behaviour, homogeneous products, full and symmetric information, free entry and exit, the absence of externalities and well-defined property rights, become increasingly fragile when information itself is the

primary input. In digital markets, information is neither symmetric nor transparent: platforms possess vast informational advantages over users, prices fail to reflect the true costs of data extraction, and individuals are rarely aware of what data is collected or which rights are effectively transferred. When ownership is ambiguous and consent opaque, exchange gives way to extraction. Once these assumptions break down, allocative efficiency no longer follows automatically, even in markets that appear dynamic and innovative.

This situation is not without historical precedent. At the dawn of the industrial revolution, labour itself underwent a similar transformation. For a long period, workers lacked both the legal recognition and the psychological awareness that their time, effort and working conditions constituted an economic asset over which they held rights. Child labour, excessive working hours and unsafe conditions were not aberrations, but features of a system in which labour markets had not yet internalised notions of ownership, consent and bargaining power. Until society recognised labour as something owned by individuals, and until that recognition was translated into social norms, regulation and collective institutions, the labour market remained structurally inefficient, and the resulting rents accrued disproportionately to industrial capitalists. Data today occupies an analogous position. It has emerged as a central input into production, yet individuals remain largely unaware of the extent to which the data they generate is economically valuable and, in a meaningful sense, theirs. As long as ownership remains diffuse, consent poorly understood and rights weakly enforced, markets for data cannot function efficiently. In that transitional phase, just as in early industrial labour markets, those best positioned to extract and exploit the resource capture outsized gains. The concentration we observe is therefore not accidental, but the predictable outcome of an economy in which a newly central factor of production has yet to be fully recognised, priced and governed.

This transformation has given rise to what Shoshana Zuboff has termed the age of surveillance capitalism: a distinct accumulation regime in which human experience itself is appropriated as raw material for commercial practices of extraction, prediction and control. In Zuboff's account, surveillance capitalism is not merely a set of digital technologies, but an economic logic in action, one that captures online, and increasingly offline, behaviour in order to modify and monetise it in the future. The resulting "behavioural surplus" is converted into predictive assets, concentrating wealth, knowledge and power on a scale without historical precedent.

Network effects reinforce this logic mechanically. More users generate more data; more data improves prediction; and improved prediction consolidates dominance. Market power in this setting stems less from traditional cost or price advantages than from informational asymme-

try and control over digital ecosystems. Many familiar critiques of Big Tech, unchecked data collection, monopolistic positions, or the ability to optimise profits across jurisdictions, are therefore not anomalies layered onto an otherwise neutral business model. They are endogenous outcomes of an economic system increasingly organised around intangible assets. As Haskel and Westlake argue in Capitalism without Capital (2017), value creation in modern economies is progressively driven by assets that are scalable, non-rival and difficult to locate geographically. Unlike asset-heavy sectors, where production is tied to physical capital, local labour and place-based taxation, digital business models naturally decouple value creation from geographic presence. This structural asymmetry helps explain why economic power, rents and regulatory frictions concentrate differently in the digital economy.

Zuboff's central warning is that surveillance capitalism tends to outrun society's capacity to comprehend and resist it. Unlike earlier economic transformations, its modalities are often deployed before democratic scrutiny, legal adaptation or social consent can meaningfully take shape. Even when moments of awareness erupt, as in high-profile data scandals, dependence on these platforms limits effective resistance. What turns this dynamic into a systemic issue, however, is its intersection with finance. Big Tech firms are no longer peripheral service providers; they have become critical infrastructure for the financial system itself. Banks, insurers and market operators increasingly rely on their cloud platforms to operate core functions, from payments and online banking to data storage and risk analytics. As financial activity migrates onto privately controlled digital infrastructure, operational dependence is quietly turning into systemic exposure. Risk, of course, is not something economic systems should seek to eliminate. An optimal system is not one in which large firms never fail, but one in which failure can be absorbed without destabilising the whole. The emerging question, then, is not whether Big Tech firms might fail, but whether the system could withstand it if they did.

The notion of "too big to fail" is not new. Its intellectual roots predate modern financial regulation, reaching back to Walter Bagehot, who in Lombard Street: A Description of the Money Market (1873) recognised the dilemma faced by authorities when the failure of a key institution threatens the stability of the system as a whole. Bagehot's famous prescription, to lend freely in crises while warning against the moral hazard such support creates, already captured the central trade-off that defines too-big-to-fail: preventing systemic collapse without undermining private discipline. This dilemma re-emerged forcefully during the global financial crisis, when policymakers intervened to prevent the disorderly collapse of large financial institutions whose failure threatened to destabilise the entire system. The lesson was not merely that some firms were large, but that their interconnectedness, opacity and

centrality rendered their failure uncontainable. In academic terms, a firm becomes systemically important when its collapse would generate spillovers that markets cannot absorb on their own, forcing the state to step in ex post, regardless of any ex ante commitment not to do so. In response, post-crisis reforms sought to contain this risk through stricter capital requirements, enhanced supervision and dedicated resolution regimes for systemically important financial institutions. Yet the core insight of the too-big-to-fail literature extends beyond banking. The ultimate test of whether a firm is truly too big to fail is not its balance sheet size, but whether markets expect public support when stress materialises. Where such expectations arise, risk pricing weakens, private discipline erodes and implicit subsidies emerge, even in the absence of explicit guarantees. The question, then, is whether similar dynamics are now taking hold beyond finance, in firms whose scale, interconnectedness and infrastructural role increasingly resemble those of the institutions once at the centre of the crisis, but whose activities lie largely outside the perimeter of systemic financial governance.

For all its efficiency gains, dependence on concentrated cloud infrastructure and digital platforms comes with real-world consequences when those systems fail. In July 2024, a routine software update by cybersecurity firm CrowdStrike[1] triggered what has been described as one of the largest IT outages in history , crashing roughly 8.5 million Windows-based systems worldwide and disrupting airlines, banks, hospitals, emergency services and media organisations simultaneously. The episode offered a stark illustration of how a single point of failure in widely deployed software can ripple across sectors that share common digital dependencies. In October 2025, a major outage at Amazon Web Services[2], the world's largest cloud provider, temporarily took dozens of widely used platforms and applications offline, highlighting how even short-lived disruptions at dominant providers can paralyse firms that rely on rented computation for core operations. More recently, Microsoft[3] disclosed a significant cyberattack targeting its server software, affecting businesses and public institutions globally and underscoring a different but equally important dimension of systemic risk: when digital infrastructure is highly centralised, successful cyber intrusions can compromise vast numbers of organisations at once. Taken together, these episodes expose a central paradox of modern digitalisation. Concentration can enhance efficiency and security at the level of individual firms, yet it simultaneously creates shared points of failure through which operational disruptions or cyberattacks propagate rapidly across the economy. When critical services, from payments and logistics to healthcare and public administration, rest on common technological nodes, shocks cease to be isolated incidents and become system-wide concerns.

[1] *Here*
[2] *Here*
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In recent years, the European Union has begun to respond to these challenges through a series of landmark regulatory initiatives. The GDPR establishes data protection and individual rights as a foundational constraint on digital business models; NIS2 strengthens cybersecurity and operational resilience obligations for critical entities; DORA extends systemic-risk logic to digital dependencies in the financial sector; and the AI Act seeks to govern algorithmic systems based on risk, accountability and societal impact. Together, these frameworks mark a significant shift: from treating digital risks as isolated technical issues to recognising their economic and societal consequences. As digitalisation deepens, however, these frameworks also reveal the complexity of governing firms whose activities cut across multiple domains simultaneously; infrastructure, data, finance and societal coordination. The systemic relevance of Big Tech does not arise from a single activity, but from the accumulation and interaction of these roles. Safeguarding competition through interoperability and portability is therefore an important pillar of the response, alongside emerging approaches to operational resilience, cyber-risk management and recovery planning. As with financial institutions deemed too important to fail, the policy challenge is not to suppress innovation, but to ensure continuity, transparency and credible safeguards where disruption would carry economy-wide consequences. The objective is not to eliminate risk, nor to slow technological progress, but to ensure that efficiency today does not become fragility tomorrow. An economic system that relies on a handful of private digital nodes cannot afford to discover, only after a failure, that they were indispensable all along.

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Brandeis, L. D. (1914). Other People's Money and How the Bankers Use It. New York, NY: Frederick A. Stokes Company.
Tirole, J. (2017). Economics for the Common Good. Princeton, NJ: Princeton University Press.
Haskel, J., & Westlake, S. (2018). Capitalism without Capital: The Rise of the Intangible Economy. Princeton, NJ: Princeton University Press.
Zuboff, S. (2019). The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power. New York: PublicAffairs.
Bagehot, W. (1873). Lombard Street: A Description of the Money Market. London: Henry S. King & Co.
Kaufman, G. G. (2014). "Too big to fail in banking: What does it mean?" Journal of Financial Stability.