

1 Technology, the Service Transition, and the New Working Class

Introduction

Over the last several decades relatively well-paid and unionized employment in manufacturing plummeted in the US, while low-wage, precarious, non-union employment in service industries surged.¹ Parallel economic transformations occurred across wealthy economies during the same period, but inequality has grown more in the US than in many of its peer nations.² The US has also been at the forefront of technological development over that time, helping to drive the mainstreaming of enterprise computers and personal computers in the 1980s, the growth of the internet in the 1990s and 2000s, the proliferation of mobile devices and other data-gathering sensors in the 2010s, and recent developments in robotics and artificial intelligence (AI).

The US' leadership in both technological innovation and precarious work is not a coincidence. As discussed in the introduction, this book argues that US employers have increasingly used new technologies as tools of class domination, suppressing workers' efforts to unionize or build other forms of associational power, and therefore keeping a lid on wages. This book further argues that employers' technological choices are intertwined with our labor laws and other institutions, so that institutions shape technological choices over time and vice versa. In other words, labor laws can encourage or limit employers' use of technology as a modality of domination, and the balance of political-economic power between workers and companies can shape the development of labor law. Still more ambitiously, this book suggests that the coevolution of technology and institutions over time reflects a deeper tension between capitalist imperatives and democratic aspirations.

Each of these arguments breaks with mainstream analyses of workplace technological development.

This chapter summarizes and defends the book's assumptions and underlying theory. Section 1.1 sketches neoclassical theories that view technological change and labor standards as being driven by apolitical forces of supply and demand, as well as contrasting theories of political economy that understand production regimes and labor standards as being more socially embedded. Drawing from those latter theories, as well as critical legal scholarship, section 1.2 proposes a model of the political economy of work and technological change in capitalist democracies. In that model, companies and workers advance their interests by deploying *power resources* across the class divide, including legal entitlements, control of data and technology, and capacities for collective action. Section 1.3 clarifies the role of class in this model and its relationship to other axes of subordination, including race and gender. Next, section 1.4 elaborates the role of technology in this model, explaining how companies can use technology both to enhance productivity and to augment their power over workers. Finally, section 1.5 traces the coevolution of technology and class relations in the long-running shift to a service economy as employers put pressure on and eventually displaced our post-World War II ("postwar") model of industrial relations.

1.1 Institutions, Technologies, and Labor Standards: Existing Models

This book's analysis of the relationship among institutions, technologies, and labor standards differs substantially from mainstream treatments of those questions. Before elaborating, it may help to define the terms "institutions" and "technologies." As used in this discussion, "institutions" indicates the laws, norms, and accepted patterns of behavior that undergird political, economic, and social life.³ Institutions serve multiple, sometimes conflicting purposes within capitalist societies. For example, they facilitate market ordering and therefore capital accumulation, while also protecting less-powerful interests against certain forms of exploitation. Institutions, therefore, both reflect and shape social power relations. The term "technology" indicates "congealed practical knowledge embedded in material culture."⁴ Technologies make it easier to do some things and harder to do others, as captured by the notion of technological "affordances," or the uses that technologies enable in particular contexts.⁵ Telescopes extend our

ability to see over distances and boats make seas passable, changing activities such as warfare and agriculture. Like institutions, technologies can be tools of domination, as some individuals and groups in society develop or utilize technologies to reinforce their power over other groups. Technologies and institutions, therefore, are both important means of shaping and maintaining social order. The two are distinct, though, since technologies are material while institutions are social.⁶

Leading theories about the relationship among institutions, technological change, and labor standards build on neoclassical models of the labor market. Those models, in turn, assume that no party has significant power over another, and understand wages as being set by market forces of supply and demand for particular skills.⁷ This leads many scholars to presume that workplace technological change is productivity-enhancing—that is, it enables workers to produce more without increased effort—on the grounds that firms in competitive markets that do not maximize productivity will lose market share.⁸ The influential model of skill-biased technological change, for example, explains stagnant wages for most workers in recent decades as an effect of technological changes like industrial automation, which reduced demand for midskilled workers, alongside changes like computerization, which increased demand for highly educated workers.⁹ Technology in that model is therefore an “exogenous and politically neutral force,” which develops in response to engineering advances and market imperatives.¹⁰

Institutional shifts like deunionization may contribute to inequality in this view, but those shifts are themselves largely driven by technological developments rather than political forces.¹¹ Indeed, such analyses tend to be skeptical that classic worker-protective laws are effective, sustainable, and/or desirable. Instead, they tend to posit a trade-off between equity and efficiency and hold that unionization and wage regulations will lead to declining overall output.¹² This approach generates a clear labor policy toolkit: states should focus on “upskilling” the workforce by investing in education,¹³ should ensure fluid and nondiscriminatory labor markets, and should use the tax system to transfer resources from rich to poor where necessary.¹⁴ But states should not generally empower workers through collective bargaining laws or minimum wage laws.

A different account of the role of power and institutions in economic ordering emerges from studies in economic sociology and comparative political economy. As a substantial body of research in those fields has shown,

prosperous economies simply have not converged on a single set of labor market or social institutions over the last forty years, despite being subject to many of the same pressures of technological change, deindustrialization, and globalization. Instead, wage inequality and precarious work have grown the most in so-called liberal market economies and welfare states (such as the US and the UK), less significantly in continental Europe (especially in nations that have active industrial policies), and even less in social democratic Scandinavia.¹⁵ There is even evidence that companies' technological preferences differ across nations, with employers in liberal nations more likely to favor "radical innovation" that develops entirely new goods or production processes, while their counterparts in more coordinated economies favor incremental changes to existing processes or goods.¹⁶ Moreover, workers' ability to build and maintain associational power and to make alliances with other groups appears to be a major causal factor behind those observed differences.¹⁷ That finding suggests different policy prescriptions than those emerging from neoclassical analyses. Namely, rather than addressing distributional concerns only through the tax-and-transfer system, which may be impossible in any event since wealth begets political might,¹⁸ it may be most effective to address them by bolstering labor's power vis-à-vis capital. Chapter 6 considers how to do so in today's political economy.

As noted in the introduction, there are natural affinities and methodological overlaps between those branches of institutionalist social science and legal realism and its descendants, which include recent scholarship in "Law & Political Economy" or "LPE." Essentially, both focus on how institutions can shape political-economic processes and outcomes. Legal scholarship nevertheless focuses on law, while institutionalist social science treats law as one among other institutions. From a legal realist perspective, the law shapes the distribution of resources and power in numerous respects. In the workplace context, for example, labor laws grant workers substantive rights, against their employers, to goods like safety, equal opportunity, and decent wages. But the law also shapes production and distribution in more subtle ways that nonlawyers may not appreciate, such as by establishing and enforcing background entitlements of contract, property, and tort, and by creating legal constructs like the joint stock corporation, which can hold property and hire employees.¹⁹ To take one example, as legal realists and their descendants have long emphasized, the enforcement of contracts between parties with disparate property holdings will tend to exacerbate

economic inequalities. In such cases, the party with greater resources—typically the employer in the labor context—can typically hold out for a better deal, while the party with fewer resources may need to work in order to eat and so will be more motivated to settle quickly. Yet in various historical periods the law has presumed that such bargains were freely chosen and that the existing distribution of property is itself fair or natural.²⁰ In that sense, law may both shape and legitimate particular distributive outcomes, sometimes in ways that escape popular scrutiny.

1.2 Power Resources, Labor Practices, and Capitalist Development

Those latter bodies of literature suggest an alternative model of the relationship among institutions, technologies, and labor standards, which this section elaborates upon.²¹ The sociological concept of *power resources* is central to this model.²² Power resources are “the attributes (capacities or means) of actors (individuals or collectivities) that enable them to reward or to punish other actors.”²³ For the purposes of this book’s analysis, the most important power resources are legal entitlements within enterprises (including the rights of investors), control over technology, and capacities for collective action, or “associational power.”²⁴ The latter two power resources—control over technology and associational power—are shaped by law but not reducible to law. For this book’s purposes, the key groups are workers, companies, and investors, and subgroups within each group. To simplify the analysis, however, the book will often refer to “workers” (or “labor”) and “companies,” and will usually refer to their conflicts as “class conflicts.”²⁵ When investors’ and companies’ interests align, the book will refer to that unity as “capital.”

Companies, workers, and their allies deploy power resources across the class divide constantly in a dynamic, iterative, path-dependent process. They do so at all levels of the economy, from the individual employment contract, to the organization of work within enterprises, to battles in courts and legislatures over the basic legal structure of production. Collective action is usually workers’ most important power resource, although skilled workers have some control over workplace technology, and today workers have an array of statutory protections against exploitation. Companies’ most important power resources are their legal control of the enterprise and workplace technology, but they too utilize collective action. The firm

itself is a form of collective action, since it aggregates investments and gives the resulting legal entity various legal powers over workers.²⁶ Companies also act collectively through trade associations and employer associations.²⁷ These battles lead to political settlements that define the terms on which labor can be purchased and sold. Those settlements are typically instantiated in law and in practice, including industrial relations systems, and then underlie facially consensual processes of economic governance. Supply and demand, therefore, help determine wages, but they are best understood not as discrete curves but as broad bands, within which the distribution of power matters greatly.²⁸ Neoclassical economics can treat the market as a sphere of individual freedom only by abstracting away from these overtly political battles and studying the bargains reached in their aftermath or shadow.

As discussed later in this section, workers are far from powerless in these processes—and yet capital has substantial structural advantages that persist over time. One reason is that workers depend on companies and investors for jobs, and states depend on them for taxes. That dependence limits workers' and states' capacity to oppose capital's interests.²⁹ Another reason is that while both workers and companies deploy power resources to seek advantages within existing production regimes, companies also deploy power resources for a very different purpose: to reshape or displace existing production methods and political settlements. (Labor does this as well—but less often and usually less successfully given its structural dependence on capital). Indeed, constant technological and social innovations are foundational to capitalism itself, as many of its classical theorists observed.³⁰ The reason is that capitalism encourages both unending accumulation and incessant competition, and competition tends to reduce profits over time. As a result, companies constantly seek out technological innovations that can give them first-mover advantages or exclusive legal rights, which translate into monopolies over scarce resources and above-average profits—or what Immanuel Wallerstein called “high-voltage” profits.³¹ Such innovations, together with aggressive expansion strategies, can also give companies substantial market power, further bolstering profits. Companies also seek to extend market processes into social spheres governed by nonmarket logics, or to upend existing laws and institutions that limit market discipline, again to ensure continued high profits and accumulation.³² This overall process is then “full of frictions, contradictions, and dysfunctions . . . but still patterned according to an identifiable logic of expansion and accumulation.”³³

Indeed, companies often seek to alter technologies and institutions at the same time, as the case of Uber illustrates. In addition to developing a proprietary app to link drivers and passengers without human intermediation, the company reshaped a heavily regulated labor market by putting drivers on the street who did not have taxi licenses, in cars that were not outfitted or registered as taxis.³⁴ By doing so, Uber forced drivers to compete with one another, pushing down wages. In other words, the company sought to protect its core innovations from market competition, even as it subjected workers to market discipline.³⁵ While Uber is not clearly profitable, many leading service-sector companies have followed similar strategies in recent decades, as chapters 3–5 show.

Workers and others nevertheless resist such efforts constantly by organizing, taking wages out of competition, and pressing for statutory protections.³⁶ In other words, they deploy *associational power* to counteract capital's *legal* and *technological powers*. Indeed, without some limits on capital's power and capacity to reshape social relations, the system itself may stumble: workers may eventually be unable to feed themselves or their children, consumer markets may fail, the trust that is a crucial precondition for human cooperation may erode, and the natural environment may be destroyed.³⁷ This interplay between forces of commodification and de-commodification highlights a deeper tension between capitalism and democracy. Namely, labor regulations and welfare programs embed capitalist work and social relations within “non-capitalist social orders”³⁸ involving norms of solidarity—and yet capital's relentless pressure for accumulation always threatens to break out of those institutions, which “both contain and sustain” capitalism as a system.³⁹

Now, to suggest that the tension between democracy and capitalist imperatives influences or structures political-economic developments does not imply any *necessary* trajectory of historical or technological change. The argument here is instead that our political economy is shaped by ongoing battles in which capital has deep structural advantages, but where capital can never wholly dominate other groups or suppress other values. With that caveat in mind, one can then see this process playing out over successive business cycles. So-called competitive capitalism gave way to Gilded Age consolidation, where high profits were in steel, railroads, and industry; and then to the New Deal and postwar settlement, where high profits were still found in heavy industry; and finally to contemporary neoliberalism,

as discussed in detail later in this chapter. Today, the high-voltage profits are in sectors like pharmaceuticals, biotech, finance, and business services, while the low-voltage profits are in service-intensive sectors like retail, food service, hospitality, and care and social reproduction (including elder care, childcare, long-term care, and education). Law also coevolved with political-economic developments over that long period. As other legal scholars have suggested, there are conceptual harmonies between laissez-faire economics and the “classical legal thought” of the late nineteenth and early twentieth centuries, between postwar managed capitalism and legal realism’s understanding of law as a means to social ends,⁴⁰ and between the contemporary resurgence of market ordering and the importation of neoliberal ideas into legal theory.⁴¹ The role of law in both the postwar order and the contemporary political economy is discussed in more detail in chapter 2.

Two nuances of this model are worth highlighting before moving on. First, to say that the ongoing marketization of life generates a conflict between capitalism and democracy is not to valorize majority rule per se, but rather to highlight the deep-seated tension between capital’s demands for ongoing accumulation and workers’ and others’ demands for basic material security. As discussed in section 1.3, workers are not a monolithic group, and decommodification efforts have often excluded non-white, nonmale workers. Workers in particular sectors or occupations nevertheless have common interests that cut across racial and gender categories, and their demands for protection of those interests are appropriately understood as democratic, in the sense that they are opposed to the interest of a privileged minority of investors and managers.

Second, class conflicts are not always zero-sum games. In many cases, companies and workers have allied with one another in particular industrial sectors to advance common goals.⁴² In other cases, working-class organization has benefited companies by reducing interfirm competition or by giving companies a partner with whom they can collaborate to unlock productivity gains. The sociologist Erik Olin Wright sought to capture this idea with a model of “positive class compromise,” under which increases in workers’ associational power “adversely affect capitalist-class interests until such power crosses some intermediate threshold beyond which further increases in working-class power are potentially beneficial to capitalists’ interests.”⁴³ That being said, Wright’s model may be more relevant to industrial than service economies given the possibility of compounding productivity growth

in industry, as discussed in section 1.5. Moreover, as discussed in subsequent chapters, companies today may be able to use new technologies to better understand what groups of workers want and to find workers with necessary skills at low cost, replicating two functions performed by unions in the past, but without empowering workers in the process.

1.3 Deeper into Class and Associational Power

The political settlements sketched above instantiate the distribution of resources and power along lines of *class* as well as race, gender, and other axes of subordination. Class itself is a deeply contested concept that has generated many theories over the years. But as the historian Ellen Meiksins Wood argued, “There are really only two ways of thinking theoretically about class: either as a structural *location* or as a social *relation*.”⁴⁴ The former approach involves sorting individuals into objective groupings based on indicia of stratification, such as income, educational attainment, or position within the division of labor, but does not posit that classes necessarily have opposed interests. The latter approach, which today is strongly associated with the work of Erik Olin Wright, understands class relations as rooted in control over productive resources and as antagonistic due to *exploitation*, or the process through which one class appropriates the fruits of another class’s labor.⁴⁵ Companies’ efforts to suppress wages among line-level workers so that investors, top managers, or both can capture a greater share of profits are a straightforward example of antagonistic class relations of this sort. Just as capitalism is ever-evolving, this tradition views class relations as being in constant flux due to technological, political, and social change.⁴⁶

Class in this sense plays little role in mainstream theorizing about work. As noted previously, neoclassical models of the labor market assume power relations away, and therefore also assume that antagonistic class relations simply do not exist. Class also plays a circumscribed role in many “information society” theories that seek to explain how the maturation of information technologies has altered capitalist economies. For example, Daniel Bell’s foundational and still-influential 1973 book *The Coming of Post-Industrial Society* foresaw many of the key conflicts and tensions of postindustrial economies, but it also suggested that class conflicts would simply become less important as production workers became more and more technically

skilled.⁴⁷ Some subsequent information society theories have drawn on Bell's work and methodology and have echoed Bell in viewing class conflicts as being less important in today's economy. Manuel Castells, for example, has argued that "production-based, social classes, as constituted, and enacted in the Industrial Age, cease to exist" in today's economy.⁴⁸ This statement is difficult to parse—in other writings Castells has suggested that work today entails persistent conflicts and inequalities—but it can be read to suggest that class conflicts are no longer important.⁴⁹ Similarly, Shoshana Zuboff's influential recent work on "surveillance capitalism"—which explores the tech giants' business model in relationship to consumers—says little about workplace and economic power relations, as several reviewers have noted.⁵⁰

While it is true that industrial-era class conflicts no longer predominate, a major theme in this book is that class conflicts have not disappeared in the past few decades. Rather, they have evolved and even become more acute in some respects. A distinguishing characteristic of the workers in today's service sector is that they have much less associational power than their industrial forebears. This is so for various reasons, but a major one is that companies across the service economy have adopted business models that depend on suppressing workers' associational power, as discussed in later chapters.

In addition to Wright's and Wood's theories, two other bodies of thought help elucidate the role of institutions and technology in shaping class relations. The first is associated with the historian E. P. Thompson and others who have emphasized that class formation involves political contests carried out in both the economic and symbolic registers.⁵¹ A simple example from the union-organizing context illustrates this point. Employers in the US tend to resist unionization bitterly and frequently terminate union activists.⁵² Doing so is illegal, but employees typically get the intended message that organizing is futile or dangerous.⁵³ As a result, it is often *irrational* for workers to try to unionize in the US, since the benefits of unionization are uncertain and will arrive only in the long term, while the costs of joining a union are often immediate and severe. Workers can overcome employer resistance and their own fears, however, "by defining a *collective identity*" in which "being a member is a value in itself [and] each member is legitimately required to practice solidarity."⁵⁴ The foundation of that identity is workers' common experience—that is, a similar occupation or craft, colocation in a large and dangerous factory,

religious or ethnic ties, and other factors. Deeper bonds of solidarity are then forged among workers through the process of organizing and challenging managerial authority, as chapter 4 discusses in more detail.⁵⁵ But as also discussed in chapter 4 and elsewhere, companies can make it harder for workers to build solidarity by surveilling them more intensively, monitoring their communications, and arranging production to limit workers' interpersonal contact.

Another body of class theory, developed by the sociologist Aage B. Sørensen, helps explain the *ends* of contemporary class politics. Sørensen argued that class relations are geared toward creating economic rents, generally by protecting resources against competition.⁵⁶ A rent-based class analysis, Sørensen argued, may explain how capitalist production generates antagonistic and exploitative class relations without relying on the problematic labor theory of value.⁵⁷ Profitable companies are those who create maximal product market rents or quasi-rents, often aided by robust intellectual property (IP) rights, even as they endeavor "to produce a labor market conforming to the assumption of neoclassical economics," where workers compete for jobs, wages, and assignments.⁵⁸ Workers, meanwhile, seek to avoid market discipline by developing specialized skills or by organizing and therefore cartelizing the supply of labor.⁵⁹ As the Uber example in section 1.2 illustrated, and as subsequent chapters argue, today's large, low-wage employers utilize both strategies: they protect their own innovations against competition even as they subject workers to intense market discipline.⁶⁰ Through those twin processes, they ensure that investors and managers—not line-level workers—capture the lion's share of profits.

Now, to emphasize a point noted earlier, this book does not assert that class is the most important form of social division. After all, workers are not now and have never been a monolithic group. Indeed, as scholars within the Black Radical tradition have emphasized, it is simply impossible to understand class formation outside of processes of racial differentiation and subordination.⁶¹ Similarly, as numerous feminist scholars have argued, it is impossible to understand class politics in the paid labor market without accounting for unpaid labor in the home, which is disproportionately performed by women,⁶² as well as the tendency for women to be shunted into low-paid service jobs.⁶³ Such asymmetries were written into New Deal and postwar labor law, which excluded agricultural and domestic workers,⁶⁴ failed to guarantee equal opportunity on the basis of race or gender

until 1964,⁶⁵ and failed to recognize unpaid care work within homes as labor. Capitalism in the New Deal and postwar eras was therefore socially embedded both in norms of working-class solidarity that mitigated market discipline within the industrial core and in norms of patriarchy and white supremacy that defined who was inside and outside the relatively privileged working class.⁶⁶ In that sense, to say that workers' class-based demands for social protections are "democratic" glosses over this exclusion of most workers from the political-economic "demos."

At the same time, just as class relations cannot be understood outside the context of race, race-based subordination cannot be fully understood outside the context of class. As the historians Destin Jenkins and Justin Leroy have recently argued, racial differentiation has been central to capitalist development, in part because "the violent dispossessions inherent to capital accumulation operate by leveraging, intensifying, and creating racial distinctions."⁶⁷ In the US, that process was acutely visible during slavery and Jim Crow. But it has continued through to the present, where non-white individuals remain especially vulnerable to wealth expropriation (e.g., through housing foreclosure).⁶⁸ Furthermore, Jenkins and Leroy argue, race-based differentiation helps to legitimate capitalism itself by "naturalizing the inequalities produced by capitalism."⁶⁹ In this light, the longstanding exclusion of Black and other non-white workers from full social citizenship was not motivated simply by animus or racism. It also reflected many elites' material interest, in both the North and South, in maintaining a large pool of subordinate labor.

Race, gender, and class are also intertwined in the sense that opposition to labor commodification can cut along race and gender lines, as collective action often grows out of common experiences of racial and gendered oppression. The Black Freedom movement in the 1960s pushed for landmark civil rights legislation, including Title VII, in part to ensure a path out of poverty for Black workers. Similarly, a movement among health-care workers linked to the Black Freedom movement led state legislatures to extend collective bargaining rights to public-sector workers in the 1960s and 1970s, eventually spurring Congress to extend rights under the National Labor Relations Act (NLRA) to most private hospital workers.⁷⁰ Many of the most vibrant workers' rights movements in recent years have evolved among, and have been led by, women and Black, Indigenous, and

people of color (BIPOC) individuals. These include health-care and public-sector organizing, the Justice for Janitors campaign, which fights for the rights of janitors across the US and Canada, the Fight for \$15, a movement of low-wage workers in fast food and elsewhere who have been pushing for a \$15 minimum wage and unionization, and the successful effort to organize Amazon's Staten Island Warehouse.⁷¹ While public debates around progressive policies often pit concerns of race, class, and gender against one another, in reality the three overlap quite substantially in today's economy. In that respect, and as chapter 6 argues, ensuring a more democratic political economy would advance equity along all three lines.

1.4 Technology as a Power Resource, Past and Present

As noted previously, this book agrees with mainstream accounts that workplace technological change often enhances labor productivity—but it breaks with mainstream thinking by emphasizing that workplace technology is also an important tool of class power. Technological innovation can enhance labor productivity in various ways. For example, companies often use machinery and algorithms to perform work previously performed by humans. They also improve existing machinery and algorithms to make them faster, more accurate, or more energy efficient. And they can alter workplace processes without changing machinery, for example by changing the layout of machinery in a factory so that goods travel a shorter distance between workstations. In many occupations and sectors, companies have incentives to upskill their workforce when integrating new technologies. Such efforts are common, for example, in advanced manufacturing and health care.⁷² Companies may be more likely to offer such training where they have reached the sort of “positive class compromise” discussed earlier, which facilitates trust and long-term joint commitments between workers and companies.⁷³

While many (or even most) workplace innovations enhance productivity, companies also adopt technologies to augment their power over workers and capture a greater share of profits.⁷⁴ Power-augmenting technology takes two basic forms. First, companies can use technology to deskill or “homogenize” work, enabling it to be performed by individuals without the need for extensive training.⁷⁵ Homogenization strategies were central

to the transformation from craft-based to industrial production and to the emergence of Taylorist/Fordist modes of production, as discussed later in this section. Second, companies can monitor work more closely, projecting a credible threat that underperforming workers will be identified and terminated.⁷⁶ In that sense, surveillance is a political intervention by companies designed to maintain their unilateral control over workplace processes and the pace of work.⁷⁷

There are various well-known historical examples of employers using technologies as tools of class power. The simplest cases involve changes in productive machinery that lead to a greater capital share of profits but static or even declining labor productivity. The technology scholar Langdon Winner gives as an example the decision by the nineteenth-century industrialist Cyrus McCormick to install pneumatic molding machines that were more expensive and less precise than the state of the art. In other words, those machines were inefficient, but after adopting them, McCormick was able to prevent unionization of his plant by firing the skilled craft workers who had previously performed the task. After several years, McCormick got rid of the machines, “but by that time they had served their purpose—the destruction of the union.”⁷⁸

A likely more common case involves technologies that enhance both productivity and employer power. For example, sociologists and economists have frequently noted the blurred line between productivity enhancement and power augmentation in the transformation from cottage industry to factory production in textiles. Industrialists created factories not just to gather productive machinery in one place, but also to monopolize productive knowledge and instill a modern form of labor discipline, in which workers show up on a regular schedule and can be closely monitored.⁷⁹

The later transition to heavy industrial production was again based on interlocking changes in productive technology and workplace surveillance. Frederick Winslow Taylor’s system of “scientific management” was specifically designed to centralize management’s control over production, wresting it away from craft workers and their unions, which controlled apprenticeship programs, chose technologies, and established output rates and wages as the “law” for their crafts.⁸⁰ As Taylor put it, scientific management was “directly antagonistic to the old idea that each workman can best regulate his own way of doing the work.”⁸¹ He instructed industrial engineers to closely observe and measure workers’ actions, and then break

production into “discrete, rationalized, low-skill tasks” that could be performed by workers with little specialized training.⁸² Craft workers were well aware of the engineers’ motives and would often resist such monitoring, or even refuse to work at all if supervisors were present.⁸³

Today’s companies continue this tradition, using information and communications technologies both to enhance productivity and to augment their power over workers. In that respect, the politics of workplace technology today carries forward many of the class conflicts of the industrial era. One through line, which runs all the way back to early industrialization, is that companies can use technologies to render work processes and workers’ interactions more legible to a central authority, and therefore more susceptible to centralized control.⁸⁴ The telegraph, the telephone, and the fax machine all enabled the integration of enterprises across vast distances, generating economies of scale but also enabling closer supervision of workers. Today, companies use information and communications technologies for similar purposes, but modern tools of surveillance are vastly more powerful than their forebears. As chapters 3–5 explore, companies today frequently aspire to surveillance that is constant (always operating), universal (reaching all aspects of work and production, and even workers’ lives outside of work), and controlled centrally rather than being embodied in individual supervisors.⁸⁵ Surveillance today is also asymmetric: companies are able to monitor workers with or without their knowledge, and to prevent workers from monitoring management. It also appears that companies are increasingly using technological design choices to govern work where feasible, since workers may then be unable to contest those actions.⁸⁶ If it is impossible to use Uber’s app without accepting location tracking, for example, then drivers and consumers must either consent or lose access.⁸⁷

Modern data-driven technologies differ from what came before in another respect as well. As noted in the introduction, contemporary forms of AI often work by discerning patterns in very large data pools, leading to a genuinely new form of knowledge that is *inductive* in character. Through new techniques of surveillance and data analysis, companies can place workers in statistical groupings based on aspects of their behavior on and off the job that are revealed in massive data sets. In the consumer context, companies are utilizing those insights to shape consumer choices at scale through behavioral nudges, targeted advertisements, curated social media feeds, and platform structures that reward ongoing iterative engagement.⁸⁸

In the labor context, nudges and behavioral modification occur, but they may be less necessary since companies already enjoy hierarchical authority over workers and can simply order them to perform certain tasks—or even to refrain from doing certain things outside of work. Those efforts are discussed in chapters 3–5.

1.5 Explaining Change Over Time: From the Postwar Order to Neoliberalism

The model sketched in this chapter seeks to illuminate patterns of exchange and technological deployment at particular moments, as well as changes to political settlements over time. Political settlements come under pressure for many reasons, including technological developments, changes in geopolitics, and changes in the relative power of groups across class and other lines.⁸⁹ One such transition occurred in the late 1970s and early 1980s, when our postwar model of industrial relations was displaced by what the book calls “workplace neoliberalism.”⁹⁰ This final section of this chapter traces the technological and class-relational aspects of that shift, and chapter 2 discusses the role of law in that shift.

Crisis and reconstruction The postwar industrial relations regime in the US, which became known as “industrial pluralism,” emerged out of the political and economic crises of the late nineteenth and early twentieth centuries.⁹¹ During those years, the US experienced wave upon wave of labor violence as companies and states suppressed worker movements. Congress eventually asserted the power to regulate the national economy during the New Deal, passing landmark worker protection legislation, including the NLRA in 1935, which became a centerpiece of the postwar order.⁹² The NLRA declared a national policy of “encouraging the practice and procedure of collective bargaining and . . . protecting the exercise by workers of full freedom of association.”⁹³ Workers then unionized in massive numbers, especially in heavy industry, and over time they secured wage gains that tracked productivity, as well as generous health and other benefits. The merits and limits of the postwar regime and of postwar labor law are discussed in more detail in chapter 2.

The postwar regime was relatively stable not only because it protected workers, but also because it helped to solve problems that companies and the state could not solve on their own.⁹⁴ For example, collective bargaining

substantially reduced the labor violence that plagued the US prior to the New Deal.⁹⁵ Moreover, where industries were unionized across the board, collective bargaining tended to set relatively uniform wages, which helped the more productive firms thrive.⁹⁶ As a result, wealthy economies enjoyed a virtuous cycle of full employment, price stability, economic growth, and economic equality. Unions also enabled workers to raise concerns about conditions and tensions on the shop floor or to identify inefficient workplace processes, contributing to overall productivity.⁹⁷ The postwar political-economic order combined these labor market institutions with Keynesian economic planning, which boosted aggregate demand, and with the hegemonic position of the US over much of the Global South, which ensured cheap access to raw materials and large export markets.⁹⁸ Similar structures were built across wealthy nations at the time, which appears to be a major reason that this was the only period of sustained shared prosperity (within those nations) in the history of capitalism.⁹⁹

Yet even in this remembered heyday of more coordinated and egalitarian American capitalism, class fissures and antagonisms were ever present.¹⁰⁰ One reason was that unions were effectively unable to organize new industries after Congress ratcheted back their powers and enabled states to pass “right to work” laws in 1947’s Taft-Hartley Act.¹⁰¹ As discussed in chapters 2 and 4, another was that the National Labor Relations Board (NLRB) and the courts gave employers various powers to resist unionization beginning early in the New Deal era, which they exercised through the postwar era. Yet another was that the New Deal order democratized the economy in a limited fashion, failing to protect many of the nation’s most vulnerable workers. Those elements of the postwar regime helped prevent the emergence of a robust and multiracial labor movement.¹⁰² Unions were then caught flat-footed by shifts in the geopolitical environment in the 1970s as oil shocks, competition in global manufacturing, and stagflation generated a crisis of profitability.¹⁰³

Companies and investors then pressed for and achieved a new political settlement, now widely known as “neoliberalism,” which enabled them to generate sustained profits once again.¹⁰⁴ Financial interests, for example, advocated for the repeal of New Deal-era restrictions on banking activities,¹⁰⁵ while manufacturers pressed governments to open up new markets to trade and pressed for union concessions in their domestic operations. The results include the legal architecture of globalization that is now familiar:

liberalized trade in goods and services, protections for cross-border movements of capital, and strong, harmonized IP rules. Together with industrialization in many Global South nations, this generated a massive shift in global income: elites across the world and peasants and middle classes in the Global South saw enormous gains, lifting hundreds of millions out of grinding poverty, but the Global North's middle and working classes saw their income stagnate or even fall.¹⁰⁶

The service transition These institutional shifts occurred alongside the shift to a service economy across wealthy nations. In the US, that transition actually began early in the postwar era, as industrial machinery became more efficient and new computer systems developed during the war were implemented in factories.¹⁰⁷ As a result, the core industrial working class was itself eroding throughout the postwar era, with manufacturing jobs declining as a percentage of total employment beginning in the mid-1950s.¹⁰⁸ Meanwhile, as the demand for industrial workers was declining, the demand for service workers was growing.¹⁰⁹ This trend also began early in the postwar era, as prosperity and the US's global leadership in manufacturing increased demand for business services such as advertising, accounting, and law—which in turn generated demand for low-end services catering to urban professionals and the middle class, including restaurants, hotels, and retailers.¹¹⁰ The entry of women into the paid workforce in large numbers further bolstered demand for services once performed in the home.¹¹¹

In the US, the inflection point came in the early 1980s, as successive waves of deindustrialization eviscerated many communities across the country.¹¹² Companies' technological choices played a substantial causal role here. Automation became cheaper and easier due to factory robotics, though robotics were also largely limited to the industrial context.¹¹³ Outsourcing was facilitated by nascent, networked information technologies that improved over time, enabling companies to keep in close contact with (or surveil) suppliers and workers in far-flung, global production networks.¹¹⁴ The social ills of deindustrialization, such as addiction and mental health—and the ongoing needs of a retired or displaced industrial workforce—then generated increased demand for health care in many cities. Over time, cost pressures and interest group politics encouraged a model of health-care provision that depended on a highly exploited workforce.¹¹⁵

The service transition also altered the economics of work and social protections, generating new pressures on employers, collective bargaining

regimes, and welfare states.¹¹⁶ The reason is that service-dominated economies cannot easily replicate the virtuous postwar cycle of higher wages, higher productivity, and economic growth because it is more difficult to generate compounding productivity gains in services. This has become known as the “cost disease,” after the economist William Baumol’s theory that the relative price of services increases over time as productivity growth reduces the cost of manufactured goods.¹¹⁷ Baumol’s original example was a string quartet: the productivity of string quartets has not increased at all in centuries, yet performers are paid much more today than they were in Beethoven’s Vienna. The in-person services that dominate today’s economy are often susceptible to the cost disease, either because the good produced is a worker’s labor (in the case of performing arts or home-based health care) or because workers are performing tasks that are difficult to mechanize (e.g., a waiter delivering meals to customers, a retail worker stocking shelves or helping a customer, or a gig worker delivering a package).

While the cost disease affects all major economies today, its effects are mediated through policy and institutions. Those institutions have pushed costs and risks onto workers to a greater extent in the US than in most other wealthy nations. As Kathleen Thelen has put it, the US’ response to the service transition involved “a neoliberal offensive in which class cleavages predominate[d].”¹¹⁸ During the acute phase of deindustrialization, for example, industrial workers were basically left to fend for themselves. Congress’s major targeted response, the 1988 Worker Adjustment and Retraining Notification (WARN) Act, does not require worker retraining or even severance pay. Rather, it simply requires in many cases that companies give notice to workers before mass layoffs.¹¹⁹ To this day, the US has few structured job training programs, relying instead on educational institutions—which are often for-profit enterprises—to train workers in specific skills and to grant occupational certifications. Other countries responded differently. In Denmark, for instance, the state’s “active labor market policies” aim to retrain and rehire workers as quickly as possible.¹²⁰ Germany pivoted to high value-added manufacturing, which enabled its companies to maintain profitability despite high wages and robust systems of worker representation, including industry-level bargaining, works councils, and seats on companies’ supervisory boards.¹²¹ Service workers in Germany, however, are exposed to substantial market discipline, much like their American counterparts.¹²²

In any event, the distinctly liberal approach to welfare, worker training, and industrial policy in the US has left us with a high proportion of low-wage and precarious work. In reality, we have a new working class—one that is employed in services rather than industry, that is disproportionately non-white and female, and that is barely unionized.¹²³ The outlines of that new working class are apparent in data on employment levels and wages. Before COVID-19, there were around 13 million manufacturing workers, with a median wage of around \$22 per hour.¹²⁴ They still represented a substantial proportion of the workforce. However, prior to COVID, there were nearly as many workers in food service alone—11 million, including almost 4.5 million in fast food. There were also nearly 10 million retail workers, over 4 million hand laborers (including warehouse workers), 2.5 million janitors, and almost 2 million in hotels and hospitality. Over the same era, demographic and other trends also generated greater demand for health care, which has overtaken manufacturing as the largest sector in many cities.¹²⁵ To be clear, there are still many skilled craft workers in the US, as well as midskilled workers in the health-care and technology fields. But the growth of employment in low-wage services remains one of the most important economic and political developments of the last few decades.

Compared to their industrial forebears, service-sector companies face distinct challenges. Most important, low productivity growth in services incentivizes those companies to suppress wages, arguably to a greater extent than industrial firms. Many service-sector companies also have smaller workplaces or more dispersed workforces, operate on different schedules day by day and over the course of business cycles, and require a greater proportion of workers to interact with customers. That requires a new sort of worker, one who is able to work outside of ordinary business hours and has good social skills. As discussed in subsequent chapters, companies increasingly turned to data-driven technologies to address these challenges. In particular, they used those technologies to curate a different sort of workforce and to prevent those workers from building associational power. Given the transformations in labor law addressed in the next chapter and workers' generally declining associational power over time, companies were able to take those steps with minimal resistance. As a result, by the mid-2010s, nearly half of all workers in the US—65 million individuals—made less than \$15 per hour. That included a majority of Black workers and nearly 60 percent of Latino/a workers.¹²⁶

Conclusion

This book's theory of workplace technology breaks with mainstream and dominant theories in two respects. First, while mainstream accounts tend to assume that no party has power over others in our economy, this book assumes, with heterodox economists and others, that power relations—especially of class, race, gender, and nationality—suffuse and structure the economy at every level. Second, while mainstream accounts tend to assume that companies use technologies simply to enhance productivity, this book argues that companies also frequently use technologies to augment their power over workers. The next chapter rounds out the book's theory by discussing how law has both facilitated and been shaped by these developments.

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