

## CONTENTS

*List of Figures and Tables* ix

*Acknowledgments* xi

*List of Abbreviations* xv

|    |                                   |     |
|----|-----------------------------------|-----|
| 1  | Introduction                      | 1   |
| 2  | From Labor to Land and Technology | 32  |
| 3  | The Turn to Techno-Development    | 66  |
| 4  | Obsolete Capital and Labor        | 104 |
| 5  | Robotization                      | 136 |
| 6  | The Rise of Big Tech              | 168 |
| 7  | From Factories to Platforms       | 193 |
| 8  | Coding Elites                     | 233 |
| 9  | Rewiring Techno-State Capitalism  | 272 |
| 10 | Conclusion                        | 300 |

*Methodological Appendix* 323

*Notes* 329

*References* 359

*Index* 379

# 1

## Introduction

PRESIDENT BILL CLINTON embarked on a future-looking visit to China in June 1998. The trip was only two years before he pushed the US Congress to approve the US-China trade agreement and China's accession to the World Trade Organization (WTO). Clinton was deeply invested in enhancing US-China relations. The goal was to help US companies sell and distribute products in China made by workers in the United States "without being forced to relocate manufacturing to China, sell through the Chinese government, or transfer valuable technology." The hope, moreover, was that economic and political liberalization would "inevitably go hand in hand" in China.<sup>1</sup>

Clinton's 1998 trip was widely criticized at home because it ended a nine-year hiatus in which US presidents refrained from visiting China after the Chinese government cracked down on the 1989 Tiananmen Square protests. Clinton, however, hailed China's future and sought to use the visit to set the stage for future economic engagement. Joined by First Lady Hillary Clinton, he assembled several "agents of change" for a roundtable discussion with the theme "Shaping China for the 21st Century" at the Shanghai Library on June 20, 1998. These agents of change included a law professor, consumer rights advocate, novelist, scientist, engineer, economist, bishop, and CEO of an internet company.<sup>2</sup>

In the roundtable, science and technology (S&T) emerged as a salient topic that interested both Clinton and the selected agents of change. One participant opined that China would need S&T to support sustainable economic development, and asked about opportunities for China and the United States to cooperate in this area. Clinton pointed to the growing US-China partnership in S&T along with the United States' effort to facilitate technology transfer and deal with related national security issues. He was particularly excited by the development and dissemination of the internet in China, not least because the visit coincided with the dot-com boom in the United States. Asked by the internet entrepreneur about opportunities for exchange between Chinese and US businesses, Clinton responded that there would be ample

ones in the internet sector as it was one of the most rapidly growing areas in the US economy. At one point, when discussion turned to the difficulty faced by Chinese local governments in broadening access to education, Clinton shared his vision of China's future:

I think what will happen in China—I believe this will happen because of the technological revolution—I think in your economic growth you will almost leap over a whole generation of economic experiences that older European countries and perhaps the United States experienced, where you will essentially be creating an industrialized and a post-industrial society at the same time. And therefore, more quickly, you will have to educate more people at higher levels than we did.<sup>3</sup>

Essentially, Clinton predicted the simultaneous development of an industrial and postindustrial society in China as the result of technological change and the subsequent leap of China's economy.<sup>4</sup>

Reading the news about President Clinton's mention of postindustrial society in Shanghai, sociologist Daniel Bell was surprised. Since the 1960s, Bell had presciently developed the concept of postindustrial society as a "speculative construct" against which "sociological reality could be measured decades hence . . . to determine the operative factors in effecting social change." Deeply interested in the futures of both capitalist and Communist worlds, Bell developed the notion of postindustrial society as a framework to guide research and comparative studies. In 1976, he classified China as a preindustrial, collectivist society. Seeing Clinton's comments on China's postindustrial development in 1998, Bell called the National Security Council to ask who had written Clinton's talk. When told that the president's comments were impromptu, Bell was pleased to see how far his ideas had traveled and how influential they had become.<sup>5</sup>

In *The Coming of Post-Industrial Society*, published in 1973, Bell outlines the features of postindustrial society. He forecasts a shift from a goods-producing to a service economy; the rise of a professional and technical class; a reconfigured role for S&T as the source of innovation, economic growth, and policy formulation; planning and control of technological growth by the state; and the substitution of intellectual technologies or algorithms for intuitive judgments in decision-making processes.<sup>6</sup> With its prescient focus on the relationship between economy, society, and S&T, Bell's work has significantly influenced scholarship on information, knowledge, and network societies.<sup>7</sup> Bell predicted that postindustrial society would be the major feature of the twenty-first century. Importantly, his argument was not that one type of society would fully displace the preceding one. As he wrote, "The post-industrial society . . . does not *displace* the industrial society, just as an industrial society

has not done away with the agrarian sectors of the economy. Like palimpsests, the new developments overlie the previous layers, erasing some features and thickening the texture of society as a whole.”<sup>8</sup>

Although scholars and commentators who cite his work often define postindustrial society with primary reference to services, Bell clarified that the novel and central features of postindustrial society were the mutually generative relationship between science, technology, and economy, and “the enhancement of *instrumental* powers based on technology, powers over nature and powers, even, over people.” According to Bell, the “design” of industrial society is a “game against fabricated nature” centered on human-machine relationships and the use of energy to transform the natural environment into a technical environment, while the “design” of postindustrial society is a “game between persons” in which intellectual technologies based on information, data, computing, algorithms, and programming rise alongside machine technology.<sup>9</sup> With the rise of intellectual technology, decision makers would be more future oriented, focusing on forecasting and planning as opposed to ad hoc adaptation and experimentation.<sup>10</sup> Bell predicted intellectual technology would play a crucial role in postindustrial society, and along with communication systems, structure and facilitate a new, digitally mediated global economy. Although Bell’s work is largely forgotten by sociologists in the United States today, and has certain problems and limitations, I find his emphasis on the rise of instrumental power based on technology over people in postindustrial society profoundly prescient and insightful.

To a large extent, the future projected by both Clinton and Bell has been realized in China. To be sure, some of Clinton’s remarks on China’s future proved to be wrong.<sup>11</sup> And his strategy of using China to reinvigorate US capitalism created long-term problems for the United States. But Clinton’s expectation that China would see simultaneous industrial and postindustrial development exhibited foresight, even if the actual pace of the two forms of development differed. In fact, Clinton’s prediction corresponded to the concept of “compressed development” advanced by developmental studies scholars. Countries that develop later, it is argued, tend to be able to grow economically faster than earlier developers thanks to the learning, licensing, and investment of the latter. Also, many rapid developers today experience industrialization and deindustrialization concurrently. Developmental studies scholars further contend that the historical time period in which development takes place matters since the geopolitical, institutional, technological, and ideological context for development changes over time.<sup>12</sup> According to these scholars, what they call the “compressed development era” started around 1990 with the rise of information and communications technology (ICT) and the acceleration of neoliberal globalization.<sup>13</sup> They use China’s

economic development as an extreme example of compressed development and stage-skipping “catch-up” in the “compressed development era.”<sup>14</sup>

Like the developmental states in Japan, South Korea, and Taiwan, the Chinese state plays a critical role in steering its economic development. Whereas South Korea and Taiwan began to develop during what economist Carlota Perez calls the fourth technological revolution (i.e., the age of oil, the automobile, and mass production), China’s compressed development took off during the fifth technological revolution (i.e., the age of information and telecommunications) and in an era with a much higher degree of globalization. China benefited tremendously from the learning and investment of earlier developers, including but not limited to its East Asian neighbors as well as international institutions that facilitate the cross-border movement of capital, technology, goods, and services, particularly multilateral trade agreements. China’s rural-based, indigenous industrial development burgeoned in the 1980s.<sup>15</sup> Despite the political turmoil in 1989, foreign direct investment (FDI) surged rapidly after Deng Xiaoping promised continued economic reform in 1992. FDI contributed to the rapid rise of labor-intensive, export-oriented manufacturing.<sup>16</sup> In 2001, before China’s WTO accession, news media outside China portrayed the country as the soon-to-be “factory of the world.”<sup>17</sup> From the early 2000s through the early 2010s, employment in the secondary sector, including both manufacturing and construction, rose steadily and reached a peak in 2012, but the trend reversed after 2012.<sup>18</sup>

The 1980s also saw the emergence of China’s information technology (IT)-related sectors. Scientists affiliated with the Chinese Academy of Sciences established IT companies in Beijing’s Zhongguancun, where the State Council approved the creation of the Beijing High Technology Industry Development Experimental Zone in 1998. The area soon became an important innovation hub and headquarters to numerous tech firms in China. And Clinton was proven right about the significance and growth of the internet sector in China. His trip to China in 1998 was around the time when many internet companies, such as Sina, Tencent, NetEase, JD, Baidu, and Alibaba, were founded.<sup>19</sup> The post-2008 global financial period marked a new era. As China’s major export markets were seriously hit by the financial crisis, the Chinese state doubled down on its attempt to decrease China’s reliance on labor-intensive, export-oriented manufacturing and move instead to S&T-oriented socioeconomic development (hereafter *techno-development*), in which domestic consumption plays a greater role alongside international trade.

As part of this effort, the Chinese state deliberately and successfully cultivated the internet sector as a pillar industry of China’s economy. The post-2008 period also witnessed the initial public offering (IPO) boom of Chinese inter-

net companies in the United States and their rapid rise on the world stage.<sup>20</sup> As of June 2022, among the top ten internet companies in the world, five were Chinese, while the other five were American.<sup>21</sup> In 2021, China's digital economy was worth US\$6.72 trillion, accounting for 39.8 percent of its GDP.<sup>22</sup> China and the United States are arguably the only two countries that currently constitute digital capitalist superpowers. Despite disagreements among social scientists in China about whether China is a postindustrial society now, they all agree that China today has many of the features included in Bell's conception of postindustrial society.<sup>23</sup> Indeed, China's techno-development is simultaneously a process of postindustrial transformation.

Although China was a latecomer in development and has an authoritarian political regime, it has become a world leader whose developmental experiences are now looked to as an inspiring model. Political scientist Yuen Yuen Ang analogizes China's postreform period to the Gilded Age in the United States.<sup>24</sup> Philosopher Slavoj Žižek has gone so far as to declare China "the future of capitalism," noting that the Chinese Communist Party (CCP) "has ironically proved to be a much more efficient manager of capitalism than liberal democracies." The future of capitalism and Western world orders, Žižek argues, will be a mix between free market economic policies and the political and social authoritarianism exemplified by China and Singapore.<sup>25</sup> In *The Age of Surveillance Capitalism*, social psychologist Shoshana Zuboff points out that disappointed by the turmoil of market democracy, some commentators and scholars in liberal democracies now look to emulate China. And political leaders in developing countries are keen to learn from China's state-led economic development.<sup>26</sup> For instance, in 2022, the Mwalimu Julius Nyerere Leadership School—cofunded by the ruling parties of six southern African countries and supported by the CCP—held its inauguration ceremony in Tanzania. At the ceremony, leaders of the six ruling parties expressed their excitement about the opportunity to learn from the CCP—one they hoped would lead to "Africa's development and vitalization."<sup>27</sup> Thanks to the global impact of China in our time, understanding China's techno-development is not only critical in its own right but has far-reaching implications as well.

## Behind the Gilded Facade

Despite China's tremendous success in terms of techno-development and postindustrial transformation, there is a dark side behind the gilded facade. To see through it, one has to understand the history and transformation of China's "birdcage economy." In the early 1980s, when Chinese leaders debated how to reform and open up China's economy, Chen Yun, one of the top leaders, advocated a so-called birdcage economy, using the terms *bird* and *cage* to refer

to the economy and the state's planning and control, respectively. Chen argued that China should let the bird of the economy fly, but only within a state-managed cage because otherwise the bird would fly away. Chen also emphasized the need for the state to adjust the size of the cage dynamically as the bird developed.<sup>28</sup>

Before the mid-2000s, most discussions on the birdcage economy in Chinese officialdom did not distinguish between different kinds of birds. But as the Chinese state endeavored to shift from labor-intensive, export-oriented manufacturing to techno-development, discourse about the birdcage economy started to change. Local governments began to use birds to refer to industries, businesses, and social groups, and specify different kinds of birds (e.g., "new birds" versus "old birds" or "obsolete birds"). Government officials in coastal China also contended that different kinds of birds deserved different types of cages. According to such discourse, new birds deserve less constrained and better-resourced cages that will facilitate growth, while obsolete birds should be relegated to inferior cages so as not to waste resources or slow techno-development. Whether they described it as identifying and cultivating new birds, "phoenixes," or "beautiful birds that eat less, lay more eggs, and fly high," government leaders increasingly pointed to this task as crucial to the country's future. How the birdcage economy has been conceptualized and evolved over time is thus important in understanding China's process of techno-development, as is specifying the meanings and implications of each term. What I term the *bird question* concerns the process of destroying the old and creating the new, while the *cage question* relates to what Bell called the enhancement of instrumental power over people.

### *The Bird Question*

In *Capitalism, Socialism and Democracy*, economist Joseph Schumpeter coined the concept of "creative destruction," arguing that the "fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumers' goods, the new methods of production or transportation, the new markets, the new forms of industrial organization that capitalist enterprise creates." Moreover, the process of "industrial mutation . . . incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism."<sup>29</sup>

Although strongly influenced by Schumpeter's view of the role of technology in economic growth and the need for technological forecasting, Bell expected technological advances would bring about material abundance and decrease social inequality.<sup>30</sup> As a result, Bell's work highlights the rise of the

professional and technical class, yet it has little to say about how different kinds of capital and laborers would be impacted unevenly by the “gale of creative destruction.”<sup>31</sup> Others, however, shared Schumpeter’s more pessimistic outlook. Manuel Castells argues that although technological innovation enables unprecedented fluidity, it makes redundant whole areas and populations bypassed by informational networks.<sup>32</sup> Castells further developed the concept of the “fourth world” to refer to marginalized groups in the “black holes of informational capitalism.”<sup>33</sup> Indeed, research has shown the devastating consequences of deindustrialization on people left behind by technological changes and globalization, and the widening social inequality in advanced capitalist economies.<sup>34</sup> And it is now factors such as these that many political scientists maintain have fueled rising populism in the United States and Europe today.<sup>35</sup> In 1999, Bell himself reflected on the omissions of his earlier optimism. He looked back and expressed regret that his predictions had not included the persistence of an impoverished “underclass” in the postindustrial society to come.<sup>36</sup>

In China, problems resulting from the process of destroying the old and creating the new are often more complex than similar problems elsewhere for two reasons. As developmental studies scholar argue, China is an extreme case of time-compressed development: changes have happened rapidly and left little time for adjustment. Also, in the Chinese context, the Chinese state has played an instrumental role, wielding its enormous power deliberately to destroy the old and create the new. Under such circumstances, undesirable old birds—including capital and labor—have suffered the impact of not only capricious market forces but state power too.

I began to do fieldwork in Guangdong—a forerunner of China’s techno-development—in 2009. When I returned to Shenzhen and nearby cities in the mid-2010s, some small and medium-sized manufacturers pointed to arbitrary and unpredictable law enforcement campaigns as pushing their decision to close altogether. Executives and managers of manufacturers opined a not-so-distant past when they had been welcomed enthusiastically and even courted by local governments. Those governments, however, had since recast manufacturers and their workers as obsolete and “low-end.” Businesses and governments now sought to replace low-skilled workers. In 2011, responding to a rise in labor incidents, strikes, and protests, Foxconn—the largest contract electronics manufacturer in the world—declared the company’s intention to build a “one-million robot army” to replace low-skilled workers. Two years after Foxconn announced this plan, Zhejiang’s government launched its own official agenda of “replacing humans with robots” in order to advance the local economy. Zhejiang’s initiative was soon emulated by other local governments, including that of Shenzhen.<sup>37</sup>



Low-skilled workers' prospects within China's plans for techno-development were grim from the start and have remained so. As economist Scott Rozelle shows, despite the country's rise as a technologically savvy economic powerhouse, its labor force has the lowest levels of education of any comparable nation. The danger, Rozelle warns, is that this may leave a considerable proportion of China's laborers unable to find work in the formal workplace as it takes decades for a society to elevate the entire population's level of education. Questions thus arise as to how the Chinese state has dealt and will continue to deal with capital and laborers in the old sectors in its effort to pursue techno-development, and how, for their part, such old birds have responded to these changes, especially considering the country's official socialist ideology.

### *The Cage Question*

The question of how to structure the most appropriate and advantageous cage for the Chinese economy is constantly being reevaluated and fine-tuned, but has taken a particular shape under techno-development. As Bell wrote, postindustrial society is characterized by the enhancement of *instrumental* powers based on technology over people.<sup>38</sup> Bell developed his work when an idealized image of the Keynesian welfare state was predominant. While he recognized that instruments were double-edged swords that could be used to beneficial or ill effect, he did not consider the adverse consequences of an increased reliance on instruments given his own faith in technological rationality along with his tendency to assume a benign state and the supremacy of the state over capital. Bell highlighted the role of the welfare state in the economy and society at large, and saw the state as “the cockpit of politics.”<sup>39</sup> In postindustrial society, he asserted, the state would invest more and more in education and S&T in its search for ever more efficient and rational solutions to economic, social, and environmental problems.<sup>40</sup>

The development of postindustrial society in advanced capitalist countries in the post-2008 financial crisis period has revealed both the prescience and limitations of Bell's work. As scholarship on platform capitalism, surveillance capitalism, the metric society, and the society of algorithms demonstrates, postindustrial society today is indeed characterized by the rise of instrumental power and “games between persons,” as exemplified by the rise of algorithms and “gamification”—the use of game design in nongame contexts to shape people's behavior—in the digital economy.<sup>41</sup> Yet as Zuboff maintains, instead of having a benign state that exercises control over capital, postindustrial society in the United States has seen the rise of tech companies, their instrumental power in the “politics of lawlessness,” and the “secret public-

private intelligence collaboration.” Bell was right that planning and forecasting are critical in postindustrial society, but Zuboff contends that the key actors doing the planning and forecasting in the United States today are tech companies. In other words, tech companies, not the state, set the rules of the games in the digital economy. According to Zuboff, today’s “instrumentarian society” is a planned society produced through tech capital’s “total control of [the] means of behavioral modification.” Such a society leaves no room for rational deliberation or face-to-face negotiation and compromise; as a result, plans replace politics.<sup>42</sup>

If Bell were alive today, it would be extremely difficult, if not impossible, for him to find a country where intellectual technology and instrument power receive more appreciation and admiration than in China. The Chinese state is an unwavering believer in intellectual technology and instrumental power, and employs both to enhance governance and the economy. Indeed, Bell would likely be fascinated by China’s “cockpit of politics,” as presented in photos of “digital cockpits” circulated by the state media to showcase the government’s state-of-the-art scientific decision-making. In these photos, government officials operate digital platforms and sit in front of multiple oversize monitors that display visualizations of data and statistics about the economy, society, governance, and the environment. China’s influential tech entrepreneurs similarly embrace intellectual technology, as illustrated by Alibaba’s founder Jack Ma’s comments on the planned economy. In 2015 and 2016, Ma told the media and public that the planned economy would expand tremendously and become superior to the market economy by 2030.<sup>43</sup> As he put it, “Big Data will make the market smarter and make it possible to plan and predict market forces so as to allow us to finally achieve a planned economy.”<sup>44</sup> According to Ma, although the market economy won over the planned economy, big data and data science will eventually uncover the economy’s “invisible hand,” thereby contributing to a new type of planned economy.<sup>45</sup> This belief is held not only by Ma but also by some economists in China.<sup>46</sup>

The Chinese state has enacted numerous legal rules and technical instruments, such as metrics, classification systems, and digital platforms, to steer, foster, and control techno-development. Over time and with the Chinese state’s support, China’s large tech firms became the builders of such instruments. Contrary to Bell’s state-centered analysis and Zuboff’s tech company-centered narrative, the populace in China is simultaneously subject to the instrumental power of the state and tech capital. Many of my interviewees and informants in China—whether they are workers in new or old sectors, business owners in traditional sectors, or even government officials themselves—describe the struggle of navigating the cage(s) constituted by constantly changing and proliferating legal and technical instruments. Some cages are considered better than others because

they afford more freedom and resources, but no one operates outside a cage. Instead, my interviewees and informants work continually to attain better metric values, classification outcomes, and rewards, avoid punishments, and move to a better cage if possible.

The construction and calibration of cages, however, presents its own problems. Although designed to manage old birds, new birds, and techno-development in general, the legal and technical instruments that collectively comprise China's economic cage more broadly are nonetheless limited in their capacity for control precisely because their successful application can generate unruly results. The new birds selected and cultivated by the Chinese state have grown so spectacularly that they now threaten to burst the cage built for their development—prompting the state's crackdown on the tech sector in 2020.

*The Gilded Cage* aims to uncover the social order and contradictions that have emerged in the process of China's techno-development. It tells the story of birds, cages, and their consequences for those whose lives have been transformed—for better and worse—by China's rapid rise to an economic and technological world leader.

## Inquiry into the Techno-Developmental Regime

Borrowing from historian of technology Gabrielle Hecht's concept of "technopolitical regime," I use the term *techno-developmental regime* to refer to the ensemble of state and nonstate actors, institutions, ideas, cultural norms, forms of materiality, and practices that foreground the role of S&T in socio-economic development.<sup>47</sup> Components of the ensemble can be linked and configured in a variety of ways across time and place, comprising different types of techno-developmental regimes. I have chosen the word *regime* because it is more analytically comprehensive than *society* (e.g., postindustrial society), *the state* (e.g., the developmental state), or *model* (e.g., developmental models). Its meaning is broad enough to integrate insights from various scholarly traditions.

One of the thorniest questions I have grappled with while writing this book is what precisely the "gilded cage" is an instance of; what category of phenomenon I am describing and theorizing. Some readers might argue the book is about a developmental state, and others might contend it is a story of digital capitalism—capitalism facilitated by the internet—and the most recent phase of postindustrial society.<sup>48</sup> Ultimately, I would characterize the book as examining both a developmental state and digital capitalism, but not fitting squarely or exclusively into either scholarly tradition. Literature on developmental states tends to examine cases before the rise of the internet and digital capitalism (e.g., Japan, South Korea, and Taiwan). In other words, the *material* or

technological conditions in the previous studies and the Chinese case differ significantly. As a result, literature on developmental states is inadequate to analyze state-led developmental projects that culminate in a digital capitalist superpower like the Chinese case; neither can this literature help us understand the rise and penetration of instrumental power wielded by both the state and tech capital in China. Meanwhile, scholarship on digital capitalism—including surveillance and platform capitalism—tends to investigate cases in which state actors played a limited role in cultivating and shaping digital capitalism, especially the US case. Therefore, existing studies on digital capitalism cannot fully account for the Chinese case, in which the rise of digital capitalism is an outcome of state-led, time-compressed developmental projects.

As such, the existing scholarship on both developmental states and digital capitalism helps specify and explain China's techno-developmental regime, but neither does so completely. Hence China's techno-developmental regime is ill captured when characterized as an example of only one or the other. In the following section, I will discuss literature on developmental states, digital capitalism, and postindustrial society as well as ideas and beliefs about S&T, authoritarianism, and contradictions, and explain how they contribute to my analysis of China's techno-developmental regime.

### *Developmental States*

A state can play a minimal role in the economy—for example, focusing on contract enforcement and property rights delimitation, but otherwise giving business actors significant autonomy, as advocated by the Washington Consensus.<sup>49</sup> Alternatively, a state can more actively promote techno-development. Influenced by Keynesian economics, Bell expected the state to play a critical role in the planning and control of techno-development in postindustrial society.<sup>50</sup> In fact, Bell's expectations regarding the state aligned with what social scientists would later call the developmental state—one that seeks to advance economic development through state intervention, using measures such as subsidies, interest rates, tax breaks, and state procurement to influence the allocation of material resources and incentivize private actors.<sup>51</sup> Studies of developmental states often focus on successful, newly industrializing countries in East Asia—in particular, South Korea and Taiwan—whose economic growth took off under their respective authoritarian states in the 1960s. As sociologist Peter Evans argues, these developmental states promoted private capital and assisted private businesses to meet ongoing global challenges. Though they also developed close ties with the private sector, these states preserved autonomy for renegotiating goals and policies when national and capital interests were inconsistent.<sup>52</sup>

But scholars also maintain that the developmental state and its associated policies are neither unique to East Asia nor limited to the twentieth century. Rather, they are a recurrent feature of government policy during different historical periods, under different circumstances (e.g., economic crises and wars), and in different geographic locations (e.g., France, Germany, Ireland, the United States, and Latin America).<sup>53</sup> For instance, the United States had a “hidden” or “disguised” developmental state to avoid attacks from market fundamentalists between the 1980s and late 2010s (i.e., after the election of Ronald Reagan and before the increasing US-China rivalry).<sup>54</sup> State planning and subsidies—often in the name of the defense budget—contributed to technological innovations in computers, computer languages, semiconductors, and the internet in the United States.<sup>55</sup>

Literature on developmental states suggests analyzing the rise of China’s digital capitalism from the perspective of state-led development. And yet studies of developmental states tend to focus on success in specific sectors, but tell little about whether there is a process of “destroying the old,” as theorized by Schumpeter, and whether and how developmental states deal with such a process. Also, the new birds in the cases of classical developmental states (e.g., IT manufacturers) differ from those (e.g., internet companies) in China’s techno-development in terms of the extent to which firms have instrumental power over a vast populace. The relationship between the state and new birds is very different in the Chinese case compared with classical developmental states due to the tremendous instrumental and even infrastructural power—the capacity to penetrate society and implement decisions logistically throughout the realm—that internet companies possess.<sup>56</sup>

### *Instrumentality in Postindustrial Society and Digital Capitalism*

Scholarship in postindustrial society and digital capitalism helps analyze the instrumental power of both the state and tech capital, thus speaking to the cage question I framed above. Bell’s emphasis on instruments along with the promise of instrumental or technical rationality—the ability to adopt better or more technically efficient means to achieve given ends—was influenced by sociologist Max Weber’s writing on rationality and rationalization.<sup>57</sup> Weber uses the concept of rationality in an evaluatively neutral (i.e., “formal”) way to define the conjuncture of a capitalist economy, bourgeois private law, and bureaucratic authority in the modern Western social order. Rationalization refers to the process by which rationality becomes increasingly prevalent in the social order, expanding into ever more areas of life.<sup>58</sup> Although each sphere of life has its specific mode of rationality and process of rationalization, common to all is the production of calculability using means or instruments within that sphere. The

capitalist production process is rationalized and rendered calculable through techniques of accounting and labor control as well as the use of technology (e.g., machines), while the legal and administrative environment is rationalized and made predictable through formalized rules and procedures. Instrumental or technical rationalization—the development and adoption of more efficient means of achieving given ends—enables bureaucrats and entrepreneurs to exercise control over humans and nature.<sup>59</sup> Bell predicted that technological advancement would speed instrumental rationalization and vice versa.

Indeed, five decades after the publication of *The Coming of Post-Industrial Society*, scholarship on the latest iteration of postindustrial society—the metric society, platform capitalism, the society of algorithms, and surveillance capitalism—shows how digitization, the multitude of data, and the advancement of S&T (e.g., artificial intelligence [AI], data science, and scientific methods of quantification) have expedited and broadened the process of technical rationalization.<sup>60</sup> Research in advanced capitalist countries has shown that the rise of tech companies and their instrumental power has undermined privacy and autonomy and deteriorated work and employment conditions for low-skilled workers.

Although Bell's work and this more recent scholarship all highlight the role and power of instruments—especially ICT—there is inadequate theorization of the intricate entanglements between technology and another critical type of instrument: law.<sup>61</sup> Current scholarship tends to relegate the relationship between law and technology to the background, leading to limited analysis of the role of law in digital capitalism and its interplay with technology. Legal scholars, however, have pointed out the importance of incorporating an analysis of law in order to fully understand the instrumental power of technology.<sup>62</sup> Here, I define technology and law broadly. I use the term *technology* to refer to the application of scientific knowledge (e.g., computer science, data science, and administrative science) for practical purposes.<sup>63</sup> Technology can create sources of power to the extent that it has the capacity to direct or influence the behavior of others or the course of events, as illustrated by the power of algorithms for behavioral modification.<sup>64</sup> I use *law* to refer to a “body of rules of action or conduct prescribed by controlling authority, and having binding legal force.” Examples of law include provisions of statutes adopted by legislatures, regulations enacted by administrative agencies, and ordinances adopted by municipalities.<sup>65</sup> Law's binding force and legal consequences make it a powerful instrument.

As Bell wrote, postindustrial society is characterized by the planning and control of techno-development.<sup>66</sup> Law is a critical instrument for such planning and control, especially when one seeks to speed the development and adoption of technology, or (re)construct the social order as new and potentially disruptive

technologies are adopted. For its part, law can be used to promote, authorize, and/or restrict technology as well as foster techno-development.<sup>67</sup> Literature on law and development points out that law has become the framework, instrument, and vocabulary for constructing and debating development and industrial policies, including policies on techno-development.<sup>68</sup> The instrumental role of law as a means to foster techno-development can be illustrated by the Chips and Science Act of 2022 in the United States, which aims to “boost American semiconductor research, development, and production, ensuring US leadership in the technology that forms the foundation of everything from automobiles to household appliances to defense systems.”<sup>69</sup> Emerging technologies, such as gene editing technologies, tend to spark regulatory challenges from society and governmental agencies. Given its tremendous power, whether and how law authorizes, regulates, or restricts technology has significant consequences for the latter’s application and instrumental power.<sup>70</sup> In other words, the instrumental power of law influences that of technology.

Conversely, technology can facilitate legal implementation and enforcement along with the formation of legal relationships, while undermining certain aspects of law. Legal rules are constituted by abstract classifications and categories. The process of applying abstract rules and classifications to specific cases—particularly evaluating specific persons or objects and deciding whether they fall into certain categories—can have significant legal consequences. Technology is now frequently used to assist the application of law. For instance, risk assessment tools are used in legal procedures to decide if an individual possesses certain legal risks (e.g., violence) in many countries. As digital technology becomes a critical medium in economic activities, it facilitates the formation and implementation of legal relationships. In other situations, the application of technology can undermine interests and rights protected by law—for example, digital technologies’ encroachment on one’s right to privacy.

To the degree that both law and technology can influence behavior or the course of events, both can also constitute or influence the rules of games between persons in many areas of life. Legal scholar Lawrence Lessig argues that code is law in the digital world.<sup>71</sup> Similarly, as John Zysman and Martin Kenney underscore, algorithms and data in the platform economy exist as “regulatory structures” that shape the rules and parameters of action available to platform users.<sup>72</sup> Importantly, both law and technology are also Janus-faced, and can be put to redemptive and/or regressive uses to serve the interests of different groups. Yet there are differences in how law and technology can shape the rules of games. The first major one is that technical rules can be automatically executed, eliminating the need for third-party enforcement and human

deliberation.<sup>73</sup> The second difference, noted by Jürgen Habermas in *Between Facts and Norms*, is that law can be more than an instrument for extracting obedience from its subjects under certain political conditions. Specifically, as law derives its validity from the consent of the governed through the process of democratic deliberation, law can serve as the primary medium of social integration and prevent law itself as well as technology from being unduly used as means for control and domination.<sup>74</sup> In the worst-case scenario, however, powerful actors can use law and technology synergistically to undermine the rights and interests of individuals or public interest. An adequate understanding of digital capitalism and postindustrial society in general as an age of enhanced instrumental power must therefore include an analysis of the relations between, and the many potential uses and consequences of, law and technology.

Scholarship in postindustrial society and digital capitalism helps address the bird question too. As suggested by Schumpeter's work on creative destruction, Castells's writing on the "fourth world," and Bell's hindsight regret at not predicting an impoverished underclass, instruments enacted by state and business actors impact various kinds of capital and different social classes differently.<sup>75</sup> Bell predicted the rise of a technical or professional class, yet he also made it clear that it would not be technocrats but rather politicians who would ultimately hold power in postindustrial society.<sup>76</sup> Recently, sociologists Jenna Burrell and Marion Fourcade have fleshed out the class structure in the society of algorithms. They argue that a coding elite comprised of software engineers, tech CEOs, investors, and computer science and engineering professors has consolidated economic power through their "technical control over the digital means of production and by extracting labor from a newly marginalized or unpaid workforce, the cybertariat."<sup>77</sup> The above literature suggests that old birds or the working class are less likely to benefit from techno-development than new birds or the technical class. In addition, the working class is more likely to be subject to harsh instrumental rule in the era of digital capitalism. I want to mention that scholars and media outlets outside China rightly use terms like *digital authoritarianism* and the *surveillance state* to refer to the Chinese state along with its use of technology for political and social control.<sup>78</sup> Unfortunately, most scholarship in this area neglects the class dimension of the Chinese state's instrumental rule.

### *Ideas and Beliefs about Instruments*

As I have mentioned, instruments are Janus-faced, and can be put to redemptive and/or regressive uses to serve the interests of different groups. To further specify China's techno-developmental regime, we need to know more about



ideas and beliefs about instruments given their ability to influence how the rules of games between persons are enacted and then play out. Despite Bell's emphasis on culture in his writing on postindustrial society, ironically his cultural analysis did not incorporate ideas and beliefs about technology. In general, ideas and beliefs about technology differ in their degree of optimism or pessimism. The salience of these ideas and beliefs varies across societies, historical periods, and social groups.<sup>79</sup>

Scholars have documented several variants of optimistic views and beliefs about technology, such as techno-utopianism, high modernism, and technonationalism. These perspectives tend to connect technology to social or national salvation. Scientific and technological utopianism rose from the eighteenth century through the mid-twentieth century, alongside the Enlightenment and Industrial Revolution, as exemplified by the Saint-Simonian thinking that S&T would solve most of humanity's problems. Technodystopianism sees technological advance as depriving people of freedom and dignity, and ultimately bringing destruction to humanity. Skepticism about and apocalyptic views on technology became salient in the mid-twentieth century as the human suffering that could be caused S&T became increasingly evident—from Nazi eugenics to gas chambers, unethical human experiments, and the use of the atomic bomb.<sup>80</sup> In the 1960s and 1970s, techno-utopianism rose again with the advancement of new ITs and cybernetics amid discussions on postindustrial society, as demonstrated by the writings of futurist Alvin Toffler. This reincarnation of techno-utopianism culminated in the rise of the so-called Californian Ideology in the 1990s.<sup>81</sup> Although Bell considered the counterculture of the 1960s an impediment to the promise of intellectual technology and postindustrial society, the mixing of that counterculture with a profound faith in the emancipatory potential of new ITs, social liberalism of the New Left, and economic liberalism of the New Right gave birth to the Californian Ideology and US high-tech capitalism.<sup>82</sup> Until today, the Californian Ideology, which is characterized by antistatism and liberal individualism, still influences the development of digital capitalism in and beyond the United States, as seen in the antiregulatory tendency of big tech companies.<sup>83</sup>

In *Seeing Like a State*, political scientist James C. Scott documents a high modernist ideology in different parts of the world in the twentieth century, from Germany to France, the Soviet Union, China, and India. It is a strong version of “self-confidence about scientific and technical progress, the expansion of production, the growing satisfaction of human needs, the mastery of nature (including human nature), and, above all, the rational design of social order commensurate with the scientific understanding of natural laws.” As such, high modernism puts strong faith in the instrumental power of technol-

ogy in social and natural engineering. Meanwhile, Scott emphasizes that high modernism is also about “interests” as there is an elective affinity between high modernism and the interests of many state officials.<sup>84</sup>

Ideas about scientific and technological progress are often intermingled with and mobilized alongside ideas and sentiments about national progress, producing forms of techno-nationalism. Here, technology is seen as a means to achieve the goal of national salvation. Harold Wilson’s 1963 “white heat” speech is a perfect example of techno-nationalism. The transformative power of technology was central to British Labour Party policy in the 1960s. Just prior to becoming prime minister in 1964, Wilson delivered a renowned speech promising that under the Labour Party, Britain would prosper in the white heat of the scientific and technological revolution. The change was not only inevitable but necessary too; as Wilson warned, “There is no room for Luddites.”<sup>85</sup> He argued that the United Kingdom should, through democratic planning, mobilize S&T to revitalize its declining industries—a strategy that would benefit the entire nation, not just a few groups or businesses. Hecht’s research on France’s nuclear program offers another case in point. Hecht shows that when France lost standing among world leaders after World War II, its technical and scientific experts and government turned to technological prowess to restore “the radiance of France”—the country’s national glory and its place as a world leader.<sup>86</sup> Similarly, anthropologist Susan Greenhalgh contends that the idea of using S&T to save and rejuvenate China has been built into the “cultural DNA of the Chinese nation” since the late nineteenth century.<sup>87</sup> Relatedly, science and technology studies (STS) scholars Sheila Jasanoff and Sang-Hyun Kim coined the term *national sociotechnical imaginaries* to refer to “collectively imagined forms of social life and social order reflected in the design and fulfilment of nation-specific scientific and/or technological projects.” Such imaginaries, they assert, “describe attainable futures and prescribe futures that states believe ought to be attained.”<sup>88</sup> Although various actors—from nation-states to business and civil society actors—can develop their sociotechnical imaginaries, the power of the state to create dominant sociotechnical imaginaries and regulate people’s participation therein is unmatched.<sup>89</sup>

Scholars have pointed out the gap between beliefs and reality, and importantly, the consequences of uncritical beliefs in instrumental power. Scott cautions that we should not equate a high modernist ideology with scientific practice as high modernism is a faith that borrows the legitimacy of S&T. He further argues that high modernism can lead to disaster when an authoritarian state is willing and able to use its coercive power to bring high modernist designs into being as well as when a prostrate civil society lacks the capacity to resist those plans.<sup>90</sup> Scott’s warning resonates with economic geographer

David Harvey's cautions against the fetishism of technology—"the habit humans have of endowing real or imagined objects or entities with self-contained, mysterious, and even magical powers to move and shape the world in distinct ways."<sup>91</sup> Harvey contends that such fetishism arises when social actors—particularly the state and capitalists—endow technologies with powers they do not have. And while technological fetishism may have an initial grounding in material reality, Harvey asserts that it tends to escape material constraints quickly, as demonstrated by the fantasy of the total domination of nature through technology. He warns of the consequences when social actors from corporations to various branches of government invest in the belief that technology can and will solve all of their problems.

Scholarship that critiques instrumental or technical rationality suggests that beliefs in technology and instrumental power might lead to the unfettered pursuit of instrumental rationality, dissolution of ends and concentration on means alone, justification of inequality, and even the legitimation of domination.<sup>92</sup> Weber's specter of the "iron cage" imagined individuals trapped in systems based on efficiency, rational calculation, and control.<sup>93</sup> Research also indicates that a strong confidence in technology can be linked to meritocracy and used to justify inequality. When technology is considered sacred in society, individuals with technical expertise can be seen as "model citizens," while those lacking technical skills are downgraded to undeserving citizens or "political economic trash."<sup>94</sup>

The most fervent and influential critiques of instrumental rationality came from first-generation Frankfurt school philosophers Herbert Marcuse, Max Horkheimer, and Theodor W. Adorno. Marcuse considered industrial society an exploitative system constituted by means of domination and control. He contended that the increase in comfort and affluency that results from the expansion of instrumental rationality obfuscates the exploitative nature of society.<sup>95</sup> He further maintained that S&T, as a historical-social project, functions simultaneously as a productive force and ideology that legitimates political power. In *Dialectic of Enlightenment* (1947), an intellectual response to rising fascism and totalitarianism, Horkheimer and Adorno argued that the process of progressive rationalization enables human beings to exercise greater power over nature, other human beings, and themselves. In so doing, they related Enlightenment rationality to a will to mastery, control, and domination.<sup>96</sup>

*Dialectic of Enlightenment* and Bell's *The Coming of Post-Industrial Society* thus present starkly different views on the advance of technology and expansion of instrumental rationality. Although Bell did not engage with *Dialectic of Enlightenment* in *The Coming of Post-Industrial Society*, he read the former when its first English translation was published in 1972—and dismissed it as a wholesale attack on rationality. In notes I found in his personal archive in the

Harvard Library, Bell wrote, “Frankfurt opens the floodgates—the attack on rationality, on objectivity, etc.,” and “the underlying theme was a more radical rejection of modernity, a Heideggerian theme of the domination of nature.” Moreover, he held that Marcuse, Horkheimer, and Adorno understood neither technology nor democracy. In comparison, Bell highly regarded Habermas—a second-generation Frankfurt school philosopher. As Bell saw it, Habermas corrected Marcuse, Horkheimer, and Adorno’s excessive pessimism by developing the ideas of communicative and discursive rationality. For Habermas, first-generation Frankfurt school philosophers reduced rationality to domination by equating instrumental rationality with rationality per se, thus undermining the capacity of critical theory to explore possibilities for human emancipation. Although he recognizes the danger of the expansion of instrumental rationality, Habermas argues that the increase in communicative rationality, which aims to reach mutual understanding and consensus, counterbalances the danger.<sup>97</sup>

Bell’s dismissive view of Marcuse, Horkheimer, and Adorno reveals how ideas and beliefs about technology and instrumental rationality can vary significantly. Instead of assuming or asserting that any such ideas or beliefs are “irrational,” however, I analyze their capacity to influence the ways in which various actors—from the state to business actors and workers—use technology and respond to dissonances resulting from the instrumental rule of technology and law.

### *Authoritarianism*

We also have to consider political regime to further analyze China’s techno-developmental regime. Although China and classical developmental states like South Korea and Taiwan share processes of state-led techno-development, South Korea and Taiwan began democratization in the 1970s and 1980s, respectively. According to Freedom in the World reports, South Korea and Taiwan transitioned into a “free” country in 1988–89 and 1996–97, respectively.<sup>98</sup> As a result of democratization, the authoritarian developmental states in South Korea and Taiwan did not need to rely on economic performance as a major source of their legitimacy anymore. Instead, the governments turned to legal-electoral legitimacy. Also, the process of democratization and the building of the rule of law constrained how the governments there could use instruments to foster techno-development as well as structure the relationship between the state, capital, and labor.<sup>99</sup>

China’s political regime has several characteristics that have motivated and enabled the state to be *actively* and *dynamically* involved in the planning and control of techno-development. First, China has a one-party authoritarian

regime without electoral legitimacy. Sociologist Dingxin Zhou argues that the Chinese state's primary sources of legitimacy come from its economic and ritual performance along with the state's capacity for territorial defense.<sup>100</sup> Promoting techno-development helps sustain the state's legitimacy. And since economic and ritual performance are critical to the Chinese state's legitimacy, upper-level governments often use performance evaluations to ensure that lower-level governments implement techno-development agendas. Second, the CCP prioritizes maintaining its political monopoly, so the Chinese state is sensitive to threats to social stability and national security.<sup>101</sup> Measures to secure the CCP's political monopoly can be in tension, however, with those that promote techno-development.<sup>102</sup> The party-state is therefore likely to pursue the kind of techno-development that does not threaten its political monopoly. Third, the process of techno-development is dynamic. To sustain its legitimacy and political monopoly, the Chinese party-state is likely to recalibrate its planning and control when faced with crises or unacceptable risks. As political scientist Colin Hay asserts, moments of intervention can alter the state from an inertial or reactive status to a dynamic or proactive one. In an inertial status, the state tends to be fragmented, and evolves by iteratively and unreflexively adapting to failure. In other words, the state is involved in mundane, routine managerial practices and follows operational procedures in periods of relative stability. In contrast, in a dynamic status, the state tends to be more unified, at least in relevant policy areas, and evolves through reflexive, strategic, and decisive action conditioned by the intended and unintended consequences of its prior strategies. As the dynamic status itself becomes stabilized, though, the state returns to relative inertia, at least until the next perceived threat.<sup>103</sup> Hay's work resembles sociologist Xueguang Zhou's finding that the Chinese state swings between a mundane, decentralized, and fragmented status, on the one hand, and a mobilized and centralized status, on the other hand.<sup>104</sup> This process can create uncertainty and turmoil.

Furthermore, due to China's authoritarian regime, there are few restrictions on how the state can construct legal and technical instruments to foster techno-development under the rule by law versus the rule of law. Legal scholars have pointed out problems of ruling by law in general. For example, legal scholar Mireille Hildebrandt argues that ruling by law does not include a system of checks and balances that brings the legislator and administration under the reign of the law. Although ruling by law can provide some legal certainty, such certainty remains limited as the law can be easily bent. As a result, law is used as a mere instrument to influence individual behavior in view of policy goals, and can be replaced or used with other policy instruments such as technology.<sup>105</sup> Her criticism of ruling by law in general applies to the Chinese context.

Scholars have also pointed out the importance of public deliberation to socioeconomic development. Economist and philosopher Amartya Sen contends that the viability of development and human flourishing depends on the process of public reasoning.<sup>106</sup> In a similar vein, sociologist Patrick Heller and economist Vijayendra Rao show the significance of deliberation, voice, and collective action to development.<sup>107</sup> But under China's authoritarian regime, there is little external pressure to put the instrumental rationality of the state and tech capital in check, especially since the Chinese state intensified its control of the public sphere and civil society in the mid-2010s.

### *Contradictions*

Contradictions—how they emerge and what implications they have—are central to my analysis of China's techno-development. A contradiction exists “when two seemingly opposed forces are simultaneously present within a particular situation, an entity, a process or an event.”<sup>108</sup> Since my analysis centers on the pursuit of instrumental rationality, Weber's work on rationalization in the capitalist economy, legal system, and bureaucracy provides a useful and flexible analytic perspective to examine how contradictions can occur in the process of rationalization.

Although rationalization advances predictability, efficiency, and control, the process can generate antagonism, problems, and disillusion due to the contradiction between formal rationality and substantive rationality and the limits of rational action.<sup>109</sup> As mentioned, Weber uses the term *rationality* in a purely formal or evaluatively neutral way. In comparison, substantive rationality refers to the value of ends or results from certain perspectives. As such, the pursuit of formal rationality (e.g., calculability and efficiency) can be in tension with rationality from the point of view of certain substantive ends, values, or beliefs (e.g., equality, freedom, and human dignity). For example, the Chinese state's pursuit of formal rationality to foster techno-development and its performance legitimacy might contradict its goal to maintain political monopoly under certain conditions.<sup>110</sup> The contradiction between formal and substantive rationality can also occur between social groups with different interests, such as between capital and labor.<sup>111</sup>

Weber also writes about the increasing salience of means-end rational action at the microlevel as rationality became prevalent in the macro social order. He points out the inherent limits of the rationality of individual action, as shown by the distinction between the subjective and objective rationality of action. The subjective rationality of action depends on the point of view of an actor, whereas objective rationality depends on the extent to which action measures up to an objective standard according to scientific knowledge.<sup>112</sup> As

such, subjective rational actions can vary in their objective rationality. Scott's work on high modernism and Harvey's work on technological fetishism both highlight the contradiction between appearance and reality.<sup>113</sup>

The existence of contradictions in the process of instrumental rationalization does not necessarily lead to response or resistance. Although dystopian critics of postindustrialism in the 1960s and early 1970s expected postindustrial society to generate new classes of marginal and technologically superfluous people, most anticipated not conflict but instead "stolid order in a new, manipulated world."<sup>114</sup> The comfort, convenience, and affluency afforded by technology and continued participation in games between persons might, as sociologist Michael Burawoy's work suggests, manufacture consent to the rules of the games.<sup>115</sup> On the other hand, Scott's scholarship reminds us of various forms of resistance, whether hidden or overt.<sup>116</sup> Since China's techno-development involves such a wide variety of actors and situations, I examine concretely what contradictions have emerged and how they have unfolded in the process of instrumental rationalization.

## The Gilded Cage

I analyze China's techno-development from the mid-2000s to present day—a period marked by the time-compressed process of destroying the old and creating the new, and the enhancement of instrumental power over people. Noting the extraordinary transformation of China's economy and society, political scientist Yuen Yuen Ang has compared China's postreform period to the Gilded Age in the United States.<sup>117</sup> By contrast, I seek to highlight the darker implications of these changes, or as mentioned above, what I refer to collectively as China's gilded cage, but I still include the word *gilded* to acknowledge China's extraordinary success in building a globally leading digital capitalist system.

I argue that a cage constituted by a variety of instruments emerged in the process of techno-development as the Chinese state endeavored to move from an economy relying on labor-intensive, export-oriented manufacturing to "techno-state capitalism"—a digital capitalist system characterized by the rise of tech capital and an *asymmetrically* symbiotic relationship between tech capital and the state. This cage has expanded with the growth of techno-state capitalism as large tech companies began to participate in the making of the cage. As such, China's techno-developmental regime is characterized by: the proliferation of technical and legal instruments established by the state and large tech companies to regulate work and life, and enhance legibility, valuation, efficiency, and behavior modification; the legal, economic, and cultural subordination of work, workers, and forms of capital deemed "obsolete" or

“low-end” to those valorized as “high-tech” or “high-end,” despite China’s official socialist ideology; and the intensified subjection of both “low-end” and “high-end” workers and capital to the precarious and despotic rule by instruments. China’s developmental state, an amalgamated ideology of high modernism, techno-nationalism, technological fetishism, and meritocracy, and the country’s authoritarian regime explain the above qualities.

Such sweeping, lopsided, and unchecked rule by instruments is novel in China as well as distinctive compared with postindustrial societies in advanced capitalist countries and countries with a classical developmental state in the following ways. Although the Chinese state has always played a critical role in China’s postreform socioeconomic development, the Chinese state also left space for state and nonstate actors to improvise, and was previously less equipped and interested in using technical and legal instruments for micro-management.<sup>118</sup> Furthermore, no enterprises—state owned or otherwise—in the past were able to regulate and influence as many people as do large tech companies today. The scope of instrumental power now possessed by the state and large tech firms is unprecedented in China. In advanced postindustrial societies like the United States and European countries, and in East Asian countries with a classical developmental state, constraints limit the extent to which the state can use law and technology as instruments. In such contexts, it would be difficult, for example, for the state to legally discriminate against a certain type of capital or labor for its perceived inadequate contributions to techno-development.

How did the gilded cage in China come to be? The prototype of the now-fledgling techno-developmental regime emerged in coastal, more prosperous provinces in the mid-2000s as a response to the increasing limitations of labor-intensive, export-oriented manufacturing, which were subsequently magnified by the 2008 global financial crisis. Parochial political calculations and an amalgamated ideology of high modernism, techno-nationalism, and meritocracy contributed to local state-led efforts to destroy old birds and cultivate new birds. Such efforts culminated in an emerging instrumental order structurally and ideologically biased against low-end capital and labor, and in favor of their high-end counterparts. Despite criticism from the public and even the central state, this local regime “proved” its efficacy by turning the 2008 global financial crisis into an advantage for China, thereby not only saving but also strengthening the nation. Moreover, Xi Jinping, one of the earliest advocates of such a regime, ascended to the highest leadership in 2012. As a result of these developments, the technical and legal instruments of the prosperous, coastal local regimes and their underlying sociotechnical imaginaries expanded across different parts and levels of the state, although there was little centralized or carefully coordinated effort to disseminate the instruments and logic of such a



regime. An increasingly prostrate public sphere and civil society since the mid-2010s along with China's global ascendancy have shielded the techno-developmental regime from criticisms.

The overarching logic of the instrumental apparatus enacted by the state is to foster techno-development by allocating rewards and punishments to different kinds of labor and capital according to their perceived contributions (e.g., skill and technology) and detriments to techno-development as factors of production. The underlying assumption is that with enhanced instruments, the visible hand of the state will help and somehow coordinate with the invisible hand of the market to better allocate factors of production. Technology (e.g., quantification methods) and law are used as instruments for classification, (e)valuation, and (dis)incentivization. Rewards include material and symbolic resources beneficial for production, such as subsidies, land use rights, bank credits, tax breaks, state procurements, state endorsements and promotions, and critically, regulatory toleration and exemptions. In addition, rewards encompass resources for social reproduction, which refers to daily and generational activities that regenerate current laborers, cultivate future laborers, and maintain those who cannot work and the caring infrastructure (e.g., housing).<sup>119</sup> Common rewards for social reproduction include local citizenship, access to public education, access to more affordable housing, and so forth. Punishment is exemplified by harsh and selective law enforcement in the forms of fines, suspension of businesses, and eviction. Punishment also includes hyperactive rule making as law can be made easily.

State and nonstate actors must all follow the state's technical and legal rules that constitute the techno-developmental regime. And yet the very instruments for measuring and classifying the worth and worthiness of everything from capital to labor, technology, and industry according to its perceived contributions to techno-development guarantees that only some can be winners. Among nonstate actors, those considered obsolete are not only deprived of opportunities to receive rewards but also can be subject to harsh state regulation unless they can change their classifications and metric values. In contrast, those considered cutting-edge, especially business actors, prosper and gain resources and power in a friendly regulatory environment. Businesses and labor in labor-intensive manufacturing industries experienced a precipitous drop in status, while large tech firms emerged as the clear favorites in the eyes of the state, at least until the recent state crackdowns.

Importantly, as the internet sector was selected as the prized new bird by the Chinese state to advance techno-development, large tech firms headquartered in China at first enjoyed various significant rewards from the Chinese state: accessing global capital and a protected domestic market, partnering with the Chinese state, and operating in a lax regulatory environment. It is in

this context that large tech companies expanded rapidly across sectors, regions, and countries, established and controlled platform infrastructure, and contributed to the second-largest and one of the most successful digital economies in the world. It is also in this context that large tech companies have used technical and legal instruments to design and operate games between persons that influence various actors, from different kind of workers to suppliers and users. Thanks to the state's tolerant regulatory approach, the instrumental rule established by large tech firms has become part of the broader instrumental apparatus that constitutes China's techno-developmental regime. As a result, workers, suppliers, and users are subject to the instrumental rules established by both the state and large tech firms.

The same technical and legal rules that created the gilded cage have nonetheless generated various contradictions too, which in turn have reshaped the cage. The unchecked rule by instruments often ignores the public interest along with the rights of citizens, laborers, and businesses, resulting in contradictions between appearance and reality, the state and capital, the state and citizens, and tech capital and labor. The combination of technological fetishism and authoritarianism frequently leads to the dissolution of ends, a focus solely on means, and the contradiction between appearance and reality. Paradoxically, in the "obsolete" sectors, the techno-developmental regime has generated less visible discontent. Business actors now deemed obsolete have refrained from voicing their grievances precisely because they receive no moral or discursive support in the dominant sociotechnical imaginaries. Despite their many structural disadvantages in the system, most workers in these sectors do not complain about their devalued status or apparent disposability within the ascending techno-nation. Some workers have demanded equal citizenship rights and contested the government's instruments for resource distribution that are biased against their children. But many have internalized the dominant discourse that assesses people's worth and worthiness based on their contribution to techno-development.<sup>120</sup>

The contradictions of the techno-developmental instrumental regime have, quite ironically, become most visible in the "high-end" sectors. Tensions and contradictions have emerged between tech capital and labor. Despite the great promise of technology, those members of the working class who have managed to escape the "backward" sectors and join the ascending tech sectors are belatedly confronted with the bleak realities of labor. They tend to be subject to the harshest instrumental rule in the spheres of both work and life. Rather than seeing itself as a "coding elite," the rising class of technical professionals is acutely aware of the high price for its apparent success, such as the inability to resist working for extremely long hours. Contradictions have emerged between the state and tech capital as well. Ultimately, even the state itself has

become a victim of its own success, as it now struggles to curb the unwieldy instrumental and infrastructural power of big tech firms while managing the domestic and transnational risks that have followed in their wake. The state's effort to rewire the state-capital relationship through hyperactive rule making and enforcement has led to an unpredictable domestic regulatory environment and further destabilized the global conditions that earlier fostered China's development.

Despite these contradictions, the gilded cage has not prompted large-scale, overt resistance. The cage's gilded facade glorifying national and technological progress, combined with the necessity for people to engage with instrumental rule in order to improve their own position within the cage, has helped the Chinese state maintain political legitimacy and social stability—so far. But there is no guarantee that the celebrated yet superficial appearance of the cage will hold.

## Chapter Outlines

The first part of the book explains the rise of techno-development in China. Chapter 2 establishes the historical context of the Chinese state's turn to techno-development. In chapter 3, I narrate how a local, embryonic techno-developmental regime came to be credited as not only the successful solution to the 2008 financial crisis but also the key to techno-development itself. The second part of the book considers the consequences of this expanding techno-developmental regime for the traditional manufacturing sectors. Chapter 4 examines state campaigns against supposedly obsolete businesses, but also tackles the puzzle of why most businesses and workers in those sectors have chosen not to voice their discontent with their newly devalued status and the government's harsh regulations and crackdowns. In chapter 5, I explain how the instrumental effort to upgrade the traditional sectors through robotization has both reflected and reproduced the fetishization of S&T, leading to a tremendous waste of public funding. Again, I discuss the seeming acceptance and apathy of workers in this sector with their apparent disposability within an otherwise ascending techno-nation. The third part of the book shifts to the internet-related sectors, analyzing the simultaneous expansion of instrumental rule and techno-state capitalism. Chapter 6 details the rise of China's tech companies along with their instrumental and infrastructural power under the state's support. Chapter 7 analyzes how large platform companies use their technical and legal instruments for intense labor control in an unscrutinized regulatory environment, but also how this control has generated growing resistance among platform workers. Chapter 8 focuses on tech professionals—presumably the group most valued within the techno-developmental regime,

but increasingly one of the most disillusioned about China's techno-development. Finally, in chapter 9, I look at how the Chinese state has more recently sought to cage large tech companies and tackle the unintended problems generated by its pursuit of techno-state capitalism.

### A Note on Methodology

The development of this book has been, in many ways, unexpected. My journey first began with research into the market for *shanzhai* or unbranded/copycat cell phones when I was working on my JSD dissertation between 2009 and 2011. My research at the time was mainly concerned with intellectual property rights, but it gave me the opportunity to interact with various actors participating in the *shanzhai* and regular cell phone markets in Shenzhen, including chip design companies, manufacturers, retailers, wholesalers, merchants from many countries, migrant workers, and local officials. As my research continued after the 2008 financial crisis, I witnessed that event's profound impact on various actors as well as development policy and the regulatory environment in the Chinese context.

At the same time that I was completing my JSD, I was pursuing a PhD in sociology, which ultimately led to the publication of my first monograph, *The Contentious Public Sphere*, in 2018. One of the questions motivating that book was how developments in ICT impacted the emergence of a public sphere in China, particularly in light of narratives, rampant among scholars and other commentators at the time, about the democratizing potential of technology—another example of humans bestowing hope on technology. Guangdong was a good location for this project because important news organizations and internet companies, especially the Nanfang Daily Newspaper Group, NetEase, and Tencent, are there. Although I concentrated more on political development in *The Contentious Public Sphere*, I observed the rapid growth of tech firms like Tencent, their increasingly critical role in the economy, and the rapidly changing socioeconomic landscape in Guangdong. As the laboratory for China's economic reform since the late 1970s and a forerunner of techno-development in China, Guangdong has often been seen as an institutional and policy model by the Chinese state and people.<sup>121</sup> Also, postindustrial development has been a grossly uneven process within China—making Guangdong simultaneously anomalous in some respects, but also the most important province to study in order to analyze the process of destroying the old and creating the new as well as understand how China's gilded cage came to be. Indeed, it was the decade that I spent researching, observing, and talking to people in Guangdong that spurred my decision to write *The Gilded Cage*.

The scope of China's techno-development is massive, so I focus on sectors, areas, and institutions most relevant to the emerging instrumental rule that characterizes China's techno-developmental regime. Although sectors like semiconductor, telecommunications equipment, and many others listed in the Chinese state's "Made in China 2025" plan are critical to China's techno-development, companies in those sectors have less instrumental power over people than large internet companies as the latter can directly reach an enormous population. In other words, I do not aim to study techno-development or technological upgrading per se but instead the emergent instrumental apparatus that marks China's techno-developmental regime. I thus focus on internet-related sectors, but even here, it is important to recognize that these sectors are themselves vast and diverse. As I studied workers' movement from obsolete manufacturing to internet-related sectors, I decided to hone in on food delivery platforms to illustrate how tech companies exercise instrumental and infrastructural power over workers, suppliers, and users. Although different platform companies develop various instruments, the case of food delivery platforms provides a basic understanding of instrumental control. Also, food delivery platforms have absorbed many of China's workers who left the manufacturing sector.

A recurring question I have encountered when giving talks about this book is why I have not included China's social credit system in the discussion. The reason for this is that my goal in *The Gilded Cage* is to explain China's techno-developmental regime and explore the contradictions it has generated. Put another way, I am interested in the origin of the regime and its impact on people's lives. China's social credit system is only a new addition to the already existing instrumental apparatus that constitutes China's techno-developmental regime. As the State Council's guideline on the social credit system shows, the central government sees the system as an essential legal and technical instrument for promoting the optimal allocation of resources, domestic demand, industrial upgrading, and scientific development.<sup>122</sup> As such, the logic of China's social credit system corresponds to the general logic of the instrumental apparatus that I have identified in *The Gilded Cage*. Moreover, perhaps because it is relatively new, although China's social credit system has garnered much attention from media and scholars outside China, it did not figure as particularly impactful in my interviews with various actors within China—from local officials to manufacturers, workers, and tech professionals—between 2016 and 2021. They consider other evaluation systems much more consequential, such as performance evaluation systems for officials and evaluation systems that allocate resources for social reproduction.

In my empirical analysis, I collect, use, and evaluate evidence holistically. I do not restrict myself to specific kinds of evidence in my research. I always

collect as much evidence as possible. For the first part of the book, I mostly rely on secondary literature, policy and government documents, news articles, and interviews with a few scholars and technocrats. The second part of the book is based on in-depth interviews and my fieldwork. Starting in 2016, I conducted more than one hundred interviews with executives, managers, engineers, and workers in labor-intensive manufacturing sectors as well as with some local officials in the Pearl River Delta. Initial access was gained through a key informant, Tony, a former high-level employee in an electronics manufacturing company whom I have known since 2007 due to my research on *shanzhai* phones. Tony's reputation and social networks helped me gain research access. Some of my interviewees also put me in contact with their friends.

In addition to formal interviews, I had casual conversations with my interviewees. Thanks to the connections of Tony and some of my interviewees, many executives and managers were generous with their time and invited me to lunch or dinner. I also had lunch with workers in factory cafeterias and talked with them about their work, family, and views on economic transformation in China. They were all informed that these conversations would be part of research data. Since I kept in touch with some of my interviewees and contacted them from time to time, I learned of changes in their work and life trajectories. For example, some of the factory workers I knew eventually moved to the platform sector. They shared their work experiences, hopes, and disappointments with me following this transition. Furthermore, one factory in Shenzhen and another in Dongguan allowed me physical access to observe their daily operations, including their interaction with government officials, such as how they dealt with harsh law enforcement. In addition, I conducted online ethnography by joining a variety of social media groups, including those of managers in big manufacturing companies. Although I conducted most of my interviews and observations in the Pearl River Delta, I interviewed some executives and managers in the labor-intensive manufacturing sectors in the Yangtze River Delta too.

The third part of the book on internet-related sectors is mostly based on in-depth interviews and ethnography. I analyzed secondary literature, policy and government documents, news articles, and public corporate documents to understand the rise of big tech companies and the changing regulatory environment. In order to understand work in the platform sector, I interviewed sixty food delivery workers, six people with management positions, a system development engineer, and an in-house lawyer between 2018 and 2019. I did follow-up phone interviews with some of them in 2021. I also joined ten social media groups formed by platform couriers. In 2018, I conducted on-the-ground ethnography in Chongqing. One platform station allowed me to observe its couriers' and supervisors' routines, and a manager permitted me to

visit his office. Finally, I collected interview data to understand the work and life situations of tech professionals. In 2019 and 2020, I conducted in-depth interviews with five informants with management positions in different types of IT and internet companies. These informants had extensive knowledge of the labor market, recruitment process, management system, and demographic backgrounds of software engineers. I also interviewed a labor law attorney to understand the regulatory environment. After this preliminary research, I conducted in-depth interviews with sixty-four software engineers in China's IT and internet companies between 2020 and 2021. In addition, I conducted online ethnography in social media groups formed by software engineers between 2019 and 2021, and reached out to engineers who participated in labor activism. In the methodological appendix, I provide more information about my research methods and data.

The process of accessing interviewees and research sites as well as collecting and analyzing data was challenging, but I did as much as possible to reach a more comprehensive understanding. Many friends, colleagues, and students in China, Taiwan, and the United States generously helped me gain access to informants and interviewees. I also benefited from my position as a faculty member at Harvard University, one of the most well-known US universities in China. As a Taiwanese growing up in Taiwan and having lived in the United States for seventeen years, I am an outsider to China, but I have more than a decade of experience conducting research there. I listened to my informants and interviewees, tried to understand them, and questioned my own assumptions and potential biases as much as I could. Being an outsider, however, came with some advantages. For one thing, my informants and interviewees trusted I would not disclose what they said to people around them. I hold firm the principles of respect and empathy in my research. Fortunately, despite intensifying geopolitical tensions, I did not encounter difficulties or hostility in interacting with my informants and interviewees, and I deeply appreciate their trust and generosity. All interviewee and informant names are anonymized in the book to protect confidentiality.

As a sociologist, I am aware of and acknowledge the limitations of different research methods. In the process of my research, I endeavored to overcome as many constraints as I could and employed a variety of research methods. Given China's increasingly repressive political environment, some might wonder whether my interviewees felt comfortable telling me their genuine views. As my experience doing fieldwork and interviewing grew, I developed some procedures to put my interviewees at ease. It helped, too, that most of my questions were about concrete experiences in their work and life. These questions, except those related to participation in social protests, are not politically sensitive according to local norms. Also, as a former legal professional, I have expertise in

*(continued...)*

## INDEX

A page number in *italics* refers to a figure or table.

- Adorno, Theodor W., 18–19
- advertising, microtargeted, 184, 316
- African developing countries, China as model for, 5, 179
- Akamatsu, Kaname, 71, 334n73
- algorithms: antitrust actions related to, 288; behavioral modification and, 13, 184; in control and management of labor, 184–85, 267; regulated in CAC censorship campaign, 291–92; society of, 8, 13, 15, 234
- Alibaba: among top internet companies in world, 170; blurred boundary with Chinese state, 182; in competition with Tencent, 172; crackdown on (*see* Ma, Jack); Ele.me acquired by, 198; fined by SAMR, 287–88; foreign capital and foreign laws affecting, 183; founding of, 4, 169; infrastructure power of, 186; investment arm of, 181; microtargeted advertising and, 184; partnership with Chinese state, 177–80, 182; software engineers' complaints about, 242–43; software engineers' remuneration at, 248; VIE structure of, 173. *See also* Ma, Jack
- Alipay: crackdown on, 289; local governments collaborating with, 178; microlending and, 278; owned by Ant Group, 276; participating in BRI and DSR, 179; as super app, 180, 198; users of, 345n73
- All-China Federation of Trade Unions (ACFTU), 229, 275, 293–94
- Ang, Yuen Yuen, 5, 22
- Ant Group, 276–77, 279, 280, 285, 289
- anti-996 movement, 235, 248, 251
- antitrust regulation, 280, 285, 286–89, 290, 292, 294; authorities' earlier reluctance to act on, 174, 207, 276
- Apollo, 141–42, 142, 144, 145, 146–49, 155
- appearance and reality, 22, 25–26, 301, 302, 308, 315
- Apple, 33
- artificial intelligence (AI): concerns about unemployment and, 137; digital governance and, 178, 179; food delivery platforms and, 198, 221; instrumental rationality and, 13; microlending and, 277; microtargeted advertising and, 184; planned economy and, 87
- Asian financial crisis of 1997, 50
- asymmetrical contracts, 206–7, 211, 219, 225, 314
- authoritarianism: in future of free market capitalism, 5; high modernism and, 17–18; of South Korea and Taiwan before democratization, 11, 19, 99–100
- authoritarianism of Chinese regime: characteristics of, 19–21; contradictions fostered by, 25, 302; digital, 15; law under, 133; not allowing public deliberation, 21, 320; in techno-state capitalism, 189
- automation, 136–38, 141; Hu on, 51; Jiang on, 43–44, 47, 48. *See also* robotization
- Autor, David, 166



- Bacchus, 141, 142, 145, 146, 148, 149–50, 152
- Baidu, 4, 169, 174, 176, 178, 179, 198, 248
- bank loans, 150–51, 159–60, 167
- behavioral modification: of disadvantaged groups by tech firms, 315–16; power of algorithms for, 13, 184; technical and legal instruments for, 22; Zuboff on, 9, 184, 191–92, 314
- Beijing: difficulty of obtaining local citizenship in, 239; tech companies in, 4, 169, 240
- Beijing High Technology Industry Development Experimental Zone, 4
- Bell, Daniel: on competition over access to education, 135; on dominant figures in postindustrial society, 234; on Frankfurt school, 18–19, 331n97; on instrumental power over people, 3, 184, 231, 313; on intellectual technology, 3, 16, 136, 269, 329n9; Keynesian economics and, 8, 11, 132; on postindustrial society, 2–3, 5, 8–9, 15, 329n9; prescience and limitations of, 8–9; rationality and, 8, 12–13, 18–19, 331n97; social forecasting and, 45; social inequality and, 6–7, 15, 79, 315; on struggle between science and politics, 102–3; on technology for mastering scale, 182–83; on theoretical knowledge in science, 41
- Belt and Road Initiative (BRI), 171, 179–80, 183
- Biden administration, 284
- big data: confidence in use of, 86–87; in control and management of labor, 184–85; in digital governance, 178; instrumental apparatus and, 103; planned economy and, 9, 87; Xi and, 70
- big data platforms: built by software engineers, 233; local governments' use of, 94, 98, 113; for pollution monitoring, 114
- birdcage economy, 5–6, 67
- bird/cage logic, 67–68; adopted beyond coastal areas, 85; campaigns against obsolete businesses and, 108; criticisms of, 74–76, 80, 82–83; embraced in coastal provinces, 68, 71–74, 83, 85, 100; evaluating birds and, 86, 94; financial crisis of 2008 and, 77, 78, 79, 80–83, 100; Guangdong Province and, 68, 73–74, 77, 80, 81–83, 84; local governments' policies based on, 68; regulatory environment and, 272; scholars complicit in agenda of, 102; as specific type of techno-development, 100–103; Wang as advocate of, 78–79; Xi's ascendance to general secretary and, 83–85, 100–101, 108; Zhejiang policy agenda and, 70–71, 140
- bird question, 6–8, 15
- birds, types of, 6, 67
- Block, Fred, 102
- Boss Zhipin, 291
- Bo Xilai, 83–84
- bribes, 111, 114, 115, 133
- bride price, 254, 351n48
- Burawoy, Michael, 22, 238, 305
- Burrell, Jenna, 15, 234, 315
- ByteDance, 247
- cadre evaluation systems, 58–62, 76, 88, 89–91, 103
- cage question, 8–10, 12
- cages: developmental states, 310–12; instrumental apparatus and, 22, 231; as resources, especially land, 67
- Californian Ideology, 16, 189, 309
- capital: contradiction between Chinese state and, 302–3; Deng's emphasis on, 39; shift from attracting to selecting, 71–72, 73
- capitalism: authoritarianism in future of, 5; Schumpeter on creative destruction in, 6–7, 12, 15; widening social inequality in, 7
- capitalism in China, 5, 32. *See also* digital capitalism; state capitalism; surveillance capitalism; techno-state capitalism
- capitalism in United States, 3, 16
- Castells, Manuel, 7, 15, 315
- CCP. *See* Chinese Communist Party (CCP)
- censorship, 172, 267, 272, 290, 291, 319
- Chen Guojiang, 294
- Cheng Wei, 291

- Chen Hongwei, 87
- Chen Yun, 5–6, 67–68, 273
- child-rearing. *See* social reproduction
- children left behind, 34–35, 124, 128, 154, 156, 249, 250
- China dream, 85, 122, 131
- Chinese Communist Party (CCP): African developing countries learning from, 5; capitalism and, 5, 32; Hu's scientific concept of development and, 49–50; under Jiang's leadership, 45, 48–49; techno-development and, 20, 40; threats to national security and, 172; tightening control over tech giants, 283–84; Xi's focus on survival of, 273
- Chinese state: arbitrary power of, 303; boundary spanning by tech firms and, 180–83, 281–82; diverting blame for its decisions, 304; growing geopolitical tensions and, 296, 297–98, 309; planning and control of techno-development by, 9–10, 19–20; platform economy and, 229–32; robotization goal of, 138–41; simultaneously developmental and predatory, 134; swinging between decentralized and centralized status, 20, 285. *See also* legitimacy of party-state
- Ching Kwan Lee, 105
- Chips and Science Act of 2022, 14
- Chongqing: platform workers' contradictory feelings and, 227–30; research methodology in, 29–30, 325; strikes and protests of gig workers in, 225–27
- Chongqing Model, 83–84, 101
- citizenship, local. *See* household registration system
- City Brain of Alibaba, 178, 179
- civil society: Chinese state's control of, 21, 24, 308; infrastructural power of the state and, 186; suppressed criticism of techno-development and, 101; suppression and decline of, 272; Xi's concern for national security and, 275, 283
- class. *See* social classes
- classification systems, 9–10, 24, 86, 103; biased against working class, 308; predatory behavior and, 134
- Clean Network program, 284
- Clinton, Bill, 1–2, 3, 4, 307, 309, 321
- Clinton, Hillary, 1
- Clio, 141, 142, 144, 145, 148, 150
- cloud computing, 51, 62, 150, 171, 172, 178, 179–80
- coastal provinces: bird/cage logic and, 68, 71–74, 83, 85, 100; challenges to local governments by mid-2000s, 34, 66; tiered development theory and, 46–47, 71; turn to techno-development in, 34, 67, 301. *See also* local governments
- coding boot camps, 253, 257
- coding elite, 15, 234. *See also* software engineers
- common prosperity agenda, 69, 100, 294–95, 303, 313, 316
- compressed development, 3–4; China as extreme case of, 4, 7, 11, 301; of Guangdong and Chongqing Models, 84
- conglomerates: Chinese state's preference for, 180, 345n67; financial scandals of, 282
- construction: employment in, 4, 34, 37; tax revenues from, 36
- corruption, 131, 311. *See also* bribes
- COVID-19 pandemic, 186, 197, 243, 280, 296, 320
- crackdown on tech sector: antitrust issues and, 286–89, 290, 292, 294; circumstances leading to, 10, 281–85, 298; data and algorithms and, 290–92; financial risks and, 274, 275, 276–81, 289–90; labor issues and, 292–96; Ma's overestimation of his power and, 285; mobilizing different branches of government, 285–86; new birds cultivated following, 296–98; red-lines of unacceptable risk and, 273–76, 288, 298; as state power attempting to control rival powers, 286; tech giants privileged up until, 272, 273; Tencent's response to, 347n18; Xi and, 70

- creative destruction, 6–7, 12, 15, 132
- Cultural Revolution, 39, 40, 42, 109
- Cyberspace Administration of China (CAC), 176, 282–83, 286, 288, 290–92
- cybertariat, 15, 235, 269, 271
- data: capacity of Chinese state and, 317–18.  
*See also* big data
- data security: crackdown on tech firms and, 286, 289, 290, 291; state's concern about, 275–76, 282–83
- deindustrialization, 3, 7, 134
- Deliveroo, 198, 203, 212
- democratization: potential of technology for, 27; of South Korea and Taiwan, 19, 99–100, 307–8
- Deng Xiaoping: on development as hard truth, 39, 50, 58; foreign direct investment and, 4; social inequality and, 63; S&T in development and, 32, 39–42, 47
- despotic contracts and clauses: for gig platform couriers, 221, 222, 224, 225–26; manufacturers required to sign, 150–51, 166; for platform workers and suppliers, 314; for restaurant owners, 225–26
- despotic power, 185–86
- developmental states: China as model for, 5, 314; Chinese case of, 310–13; classical East Asian cases of, 310, 312; existing scholarship on, 10–12; hidden or disguised by US, 12, 189, 309–10
- developmental studies scholars, 3–4, 7, 309
- Diamond, 119
- Didi, 174–75; crackdown on, 290–91; employment created by, 179; VIE structure of, 173
- Didi drivers, 107, 112, 114, 120, 201
- digital authoritarianism, 15
- digital capitalism, 314–16; Californian Ideology and, 16; China's gilded cage and, 22; existing scholarship on, 10–11, 12–15, 313; global, 188–90, 307, 308; software engineers involved in, 267. *See also* technostate capitalism
- digital economy: Chinese state's support for, 171, 177; near-universal pride in, 300; rising since 2008, 168–69, 169; software engineers and, 233; tech giants and, 182, 186; in United States, 8–9
- digital governance, 171, 177–78, 182, 191, 199, 231, 241, 315. *See also* big data platforms
- Digital Silk Road (DSR), 179–80, 183
- Dike, 142, 148, 150
- Diligence: enforcement against, 110–12, 117–18, 119–20, 133; workers in, 121–22, 123–24, 127, 128
- dingke* (DINK), 254, 351n40
- disillusioned software engineers, 257–63, 264–65, 267, 270, 278
- domestic consumption, 4, 36, 170
- domestic demand, 28, 36, 51, 65; financial crisis of 2008 and, 78, 81
- Dongguan: access to factory in, 29, 323; benefits for high- and new-tech enterprises in, 92; campaigns against obsolete businesses in, 109–10, 118–19; conversion of closed factories in, 121; demography of, 104–7, 105, 106; evaluation instruments in, 87; famous for manufacturing, 104; high-end enterprises in, 123; housing prices in, 158, 159; protests about school issues in, 128; Wang on removing low-end groups from, 79–80. *See also* Diligence
- Dorschel, Robert, 234
- dot-com bubble, 169, 188
- driverless delivery vehicles, 198, 222
- dry shares, 114
- dystopianism, technological, 16, 22
- ecological civilization, 84, 85
- E-Commerce Law, 177
- economic development, in performance evaluation, 58–59, 61
- economic growth: cheap labor and, 32, 33–34; GDP as performance indicator and, 58–59; Hu's human-centered approach and, 319; land and, 32; slowdown since 2015, 197, 320. *See also* GDP

- economic reform, 4, 27, 32, 39, 57–58, 84–85
- education: bias against working class and, 73, 74; for children of those with talent, 92; Deng's emphasis on, 42; Hu's leadership of CCP and, 50; Jiang's emphasis on, 47, 48; low level in China's labor force, 8; in Organization Department evaluation system, 60; for postindustrial society, 2. *See also* public school access
- electronics manufacturers: complaining about legal and regulatory framework, 150–52; engineers in, 142, 142, 155–57, 159, 161, 167; land-driven economy and, 159; low-skilled workers in, 141–42, 142, 152–54; managers and executives in, 144–52, 159; research methodology at, 324; robotization and, 141, 144–50, 152–54, 155–57, 166; technicians in, 142, 155, 156, 157, 159
- Ele.me: food delivery market structure and, 198; making deliveries during COVID-19 pandemic, 186; relationship with local governments, 199. *See also* food delivery couriers; food delivery platforms
- employment: financial crisis of 2008 and, 78; flexible, 179, 193, 196, 197; growth in services, 195, 195; impact of robotization on, 138; large tech firms contributing to, 179; neglected in Chinese industrial policy, 342n29; new occupations announced by central state, 197–98; to reduce migration of low-end population, 193; secondary sector peaking in 2012, 4, 194, 194; standard vs. nonstandard types of, 203, 348n40; tertiary sector growth, 194, 194–95, 195; total by sector, 194, 194; traditional manufacturing providing opportunities for, 75; two types in techno-state capitalism, 234; in Yunnan performance evaluation, 61
- engineers in manufacturing, 155–57, 159, 161, 167
- engineers in tech firms. *See* software engineers
- Enlightenment rationality, 18, 331n97
- entrepreneurs: financial crisis of 2008 and, 82; Jiang on, 49; suffering without rule of law, 152
- environmental law enforcement: to act against obsolete businesses, 110, 113–14, 115–16, 117; repurposed to support techno-development, 132; supported by factory workers, 124
- environmental protection: encouraging investment in, 72; in evaluation systems, 60, 61; government regulations for, 108, 116; highlighted by central government, 85; Xi's emphasis on, 84, 108. *See also* pollution
- environmental-related industries, 108
- Eris, 141, 142, 145, 148, 150
- Ernst, Dieter, 342n29
- evaluation systems: bureaucrats subject to, 310–11; expansion of, 101–3; fraudulent practices in, 302; infrastructure for conducting, 94, 98; for investment projects, 87–88; for technologies and enterprises, 88, 92, 93, 94, 98; wasted public expenditures and, 302. *See also* household registration system; instrumental apparatus; metric systems; performance evaluation systems
- Evans, Peter, 11, 134, 311–12
- export-processing enterprises, 47, 334n79
- Facebook, 186, 235
- Fan Gang, 74, 75–76
- Fang Lizhi, 102–3
- fetishism, technological, 18, 22; of China's techno-developmental regime, 23, 25, 302, 316–18; institutional design of Chinese state and, 166; robotization and, 26, 145–46, 148
- fifth technological revolution, 4, 187
- financial crisis of 2008: bird/cage logic and, 77, 78, 79, 80–83, 100; businesses closed or moved due to, 119; China's move to techno-development and, 4, 23, 26, 37–38, 169–70; China's support for internet companies and, 171; disagreements between

- financial crisis of 2008 (*continued*)  
    central and Guangdong governments  
    about, 77–78; dominant narrative on  
    handling of, 80–83; export-oriented  
    enterprises and, 82, 169; Hu on trans-  
    forming the development model after, 51;  
    platform capitalism in US following, 188;  
    postindustrial society in period following,  
    8; promotion of S&T to save China and,  
    63; stimulus package and, 81, 82, 159–60;  
    techno-developmental regime in after-  
    math of, 301; urbanization and, 37; Wang  
    on solution to, 79
- financial risks: concerns leading to the crack-  
    down and, 274, 275, 276–81; cracking  
    down on, 289–90
- financial scandals, 282
- Financial Stability and Development Com-  
    mittee (FSDC), 282
- financial technology (fintech), 178, 181, 240,  
    274, 277, 280; crackdown on, 289–90
- first-tier cities, 203, 240, 241, 347n4, 350n23
- fiscal expenditures, of local governments, 35
- fiscal reforms, 32, 33, 35, 63
- fiscal revenue, and land urbanization, 36, 37
- five coordination, 49, 50, 60
- fixed-asset investment: in real estate vs.  
    manufacturing, 161–64, 162, 163, 164; in  
    Shenzhen, 161–62, 162, 163
- flexible employment, 179, 193, 196, 197
- Flora, 141, 142, 145, 150, 154
- flying geese paradigm, 71, 334n73
- food delivery couriers, 200–206; as escape  
    from manufacturing jobs, 206; in France,  
    206, 212, 214, 231; interviewees' character-  
    istics, 201, 202; number of couriers, 197;  
    performance metrics of, 208; research  
    methodology with, 325–26. *See also* gig  
    platform couriers (GPCs); service plat-  
    form couriers (SPCs)
- food delivery platforms, 28, 197–200; ab-  
    sorbing low-skilled labor, 197; architecture  
    for control and management in, 206–14,  
    213, 222, 314; delivery partners (franchisees)  
    of, 203–5, 207, 210; factories losing workers  
    to, 127, 194; food safety–related technol-  
    ogy of, 199; as labor-intensive services,  
    196; local governments and, 199–200;  
    supported by the central state, 229. *See also*  
    food delivery couriers
- food delivery worker guideline, 292–93
- foreign direct investment (FDI): allowed in  
    nonstrategic sectors, 172; export-oriented  
    manufacturing and, 4; restricted in IT  
    areas, 284; from Taiwan, 188
- foreign-invested enterprises (FIEs): alliances  
    between local governments and, 190;  
    CCP's strengthened control over, 283;  
    cheap labor for manufacturing by, 33;  
    Jiang on management technicians of, 49;  
    mobility from workers to factory owners  
    in, 126; moving elsewhere, 120; preferen-  
    tial treatment of, 74–75; removal of tax  
    benefits for, 88, 340n7
- Fourcade, Marion, 15, 234, 315
- fourth technological revolution, 4
- fourth world, 7, 15
- Foxconn: disciplinary rules at, 125; as largest  
    contract electronics manufacturer, 340n26;  
    local governments and, 190; low on  
    global value chain, 33; robotization and,  
    7, 146, 300
- France: food delivery couriers in, 206, 212,  
    214, 231; postwar technological visions  
    for, 17, 318
- Frankfurt school, 18–19, 331n97
- Friedman, Eli, 101, 312
- games between persons, 8, 14–15, 16, 22, 25,  
    190, 308
- gamification of food delivery platforms,  
    208, 210
- gaming the point systems, 128–29, 132
- GDP: criticisms of focus on, 58–59, 60;  
    digital economy as share of, 169, 169;  
    in evaluation systems, 58, 60, 61, 310;  
    Guangdong as largest province by, 77,  
    79; local governments' focus on, 115; of

- Nanshan District, 123; stimulus package of 2008 and, 159, 160
- gender ratio: in China, 105, 106; in Dongguan and Shenzhen, 105, 105–6, 106; of software engineers, 237; three provinces with lowest level of, 340n5
- geopolitical tensions, 296, 297–98, 309.  
*See also* US-China tensions
- gig platform couriers (GPCs), 203–5; grievances of, 214, 215, 219–27, 220, 224, 225; performance statistics of, 210. *See also* food delivery couriers
- gig platforms, 210–14, 213, 231
- Gilbreth, Frank Bunker, 58
- Gilded Age in US, 5, 22
- gilded cage, 22–26, 301; future of, 319–21.  
*See also* bird/cage logic
- global digital capitalism, 188–90, 307, 308
- globalization: Bell on intellectual technology and, 3; compressed development and, 4; neoliberal, 3, 33, 63, 172, 307, 309, 321, 329n13; people left behind by, 7
- global value chain, hierarchy in, 33
- Google, 172, 186, 235, 240
- Government Performance and Results Act of 1993 in US, 59
- Great Firewall, 172, 189, 307
- Greenhalgh, Susan, 17, 38, 51–52
- Guangdong–Hong Kong–Macau smart platform, 98
- Guangdong Model, 83–84
- Guangdong Province: bird/cage logic and, 68, 73–74, 77, 80, 81–83, 84; Deng’s visit to, 39; electronics manufacturing in, 141–42; evaluation instruments in, 62, 87–88, 92, 94; financial crisis of 2008 and, 80–81; fixed-asset investment in, 162–64, 163, 164; as largest province by GDP, 77, 79; law enforcement against manufacturers in, 7, 112–14, 113; metaphor of chess game in, 87–88; policy disagreements with central government, 77–78; reasonable local governments in 1990s and early 2000s, 115; robotization policy of, 140; rural migrant workers in, 34, 80; seen as model by Chinese state and people, 27; shortage of land for manufacturing, 66; small and medium-sized entrepreneurs in, 74, 80, 81.  
*See also* Dongguan; Shenzhen
- Guangzhou, 92, 159, 240
- Guangzhou Development Evaluation System, 88, 89–91
- Habermas, Jürgen, 15, 19, 314, 318, 319, 331n97
- Hangzhou, 178, 240
- Harvey, David, 18, 22, 316
- Hay, Colin, 20
- Hecht, Gabrielle, 10, 17, 318
- Heller, Patrick, 21, 312, 318
- High- and New-Tech Enterprise Evaluation Form, 88, 92, 93
- high- and new-tech enterprises: benefiting from local government corruption, 134; central government’s approved categories of, 139; in Dongguan and Shenzhen, 106, 108; fake listing of manufacturers as, 118–19; lower echelon of IT companies, 240–41; policing obsolete businesses to spare land for, 81, 108, 110; reduced corporate tax rate for, 139; required purchases from, 114; robotization and, 140; workers using classification of, 122–23
- high-end capital and labor, 22–23, 301, 305
- high-end population: favored by Wang, 79; local policies related to, 85
- high modernism, 16–17, 22, 23, 48, 49, 63, 302
- high-tech industrial parks, 121
- Hildebrandt, Mireille, 20
- Hirschman, Albert O., 320–21
- HNA Group, 282
- Horkheimer, Max, 18–19
- Household Registration Scheme in Shenzhen, 92, 94, 95–97
- household registration system, 34–35, 63; disinterest in employment issues and, 76; limiting education of workers’ children, 154; officials’ apathy toward migrant workers and, 143; point-based, 128–29, 131;

- household registration system (*continued*)  
prerequisite for purchasing housing and, 239; software engineers' job choices and, 247–48, 249; techno-development goals and, 92, 94, 95–97, 103; training programs to get points for, 128–29; Wang's sorting of population and, 79; Xi's inattention to, 69
- housing: decreasing availability of affordable rents, 258; for high-value employees, 234; Hu's leadership of CCP and, 50; local citizenship affecting eligibility to buy, 239; market-based system of, 36, 63; as problem for software engineers, 238–39; unsold in third- and fourth-tier cities, 193
- housing prices, 37, 157, 158, 159, 160, 229
- Hua Guofeng, 40–41, 42, 63
- Huawei, 121, 123, 128, 131, 178, 230, 242, 247, 284, 340n28
- Hu Chunli, 80
- Hu Jintao, 39, 49–51; Chongqing Model and, 84; human-centered approach of, 319; inequality and, 63; more liberal climate than under Xi, 74; policy shift and, 64; rural land grabs and, 159; social instability and, 274; social welfare under, 102; urbanization and, 36. *See also* scientific concept of development
- hukou*. *See* household registration system
- human capital evaluation systems, 92, 94, 95–97
- Huxley, Thomas Henry, 68
- Hu Yaobang, 43
- hyper-instrumental rationality, 307, 310, 321
- ideological work, 209, 217
- image projects, 58–59
- immigration to US or Canada, 261, 263, 294, 321
- incubators, 120, 121, 240
- industrial society: Bell on, 2–3; Jiang's policy for inland regions and, 49; simultaneous development of postindustrial society and, 2, 3
- industrial transfer, 71, 72, 73, 77, 82
- industrial upgrading: bird/cage logic and, 71–73; exacerbating economic inequality, 76; severely impacting small businesses, 117; in South Korea, 99; Wang on removing low-end population and, 79; Xi's emphasis on, 85
- inequality: automation with silence on issues of, 141; Bell's expected decrease in, 6–7, 15; in China's future, 321; development of S&T and, 41, 42, 52; education of children and, 130–31, 135; exacerbated by industrial upgrading, 76; exacerbated by metric systems, 308; hatred of the rich and, 118; Hu's concept of five coordination and, 50; instrumental rationality and, 18, 307; justifications of, 74, 307; of poverty behind high-tech success, 131; of regional development, 312; in software engineering occupation, 241–42; spatial dimension of, 239; techno-development and, 38, 63, 100, 101; tiered development theory and, 46; widening in capitalist economies, 7; Xi's response to, 69, 70, 295, 303. *See also* social classes
- informal employment, 195–96, 196, 197, 203, 231, 234
- infrastructuralization of platforms, 186–87
- infrastructural power: vs. despotic power, 185–86; of tech companies, 183, 185–87, 276, 283, 299
- innovation: in cadre/official evaluation system, 60; evaluation of firms and, 92, 93; Hu on economic growth and, 50–51; indigenous, 48, 51, 70, 78, 335n93; local policies related to, 85; Ma on risk required for, 279, 281; new birds after crackdown and, 297; reduced by real estate speculation, 160; South Korea's transition to, 99; Taiwan's transition to, 99
- institutionalization, 298–99
- instrumental apparatus, 102–3; businesses, officials, and workers struggling with, 132; class dimension of, 278; in food delivery platform economy, 231–32; legal

- instruments as part of, 108, 132–34; school admission system in, 128–31; tech giants as cobuilders of, 191; tech giants as part of, 199. *See also* evaluation systems; metric systems; performance evaluation systems
- instrumentalization of behavior, 184, 346n93
- instrumental power, uncritical beliefs in, 17–18
- instrumental power of Chinese state and tech capital, 9–10, 11, 12, 23, 25, 189, 190, 269, 299
- instrumental power of law, 13, 14, 70, 185, 301, 313–14
- instrumental power of tech companies, 183–85; Alibaba fined for exerting, 288; as food delivery platforms, 206–7, 219; software engineers suffering from, 269; undermining privacy and autonomy, 13; in United States, 190
- instrumental power of technology, 3, 8; high modernism and, 16–17; law and, 13, 14, 70, 185, 301, 313–14
- instrumental rationality: absent communicative rationality, 319; accepted in Chinese society, 52; China's authoritarianism and, 21; contradictions in process of, 21–22, 302; critiques of, 18–19; hyper-instrumental, 307, 310, 321; manufacturing consent, 305; Weber's influence on Bell and, 12–13
- instruments: ideas and beliefs about, 15–19, 316–19; limiting the future for Chinese state, 321; unchecked rule by, 23, 25
- intellectuals, 40–41, 42, 44, 48, 52
- intellectual technology: Bell on, 3, 16, 136, 269, 329n9; Chinese state's employment of, 9
- Internet of Things (IoT), 114, 139, 150, 171, 178, 184
- Internet Plus, 171, 174, 177, 180, 198, 240, 274
- internet-related sectors, 4–5, 168–70; absorbing surplus labor, 185, 299; Clinton on, 1–2, 4, 329n11; creating employment opportunities, 193; fifth technological revolution and, 187; still the most important new bird, 320. *See also* tech companies
- involution, 295–96
- Jade, 121–22, 123, 124, 127
- Japan, 4, 10, 71
- Jasanoff, Sheila, 17
- JD, 4, 169, 170, 176, 178, 186, 239, 287
- Jiangsu, 34, 58, 66, 68, 72
- Jiang Zemin, 39, 43–49; high modernism and, 48, 49; Hu's conception of development and, 50, 63; performance evaluation during tenure of, 58–59; regional development policies and, 47, 49, 71, 334n80
- Johnson, Lyndon B., 137
- Kenney, Martin, 14
- key performance indicators (KPIs): of service platform, 207, 208, 209, 214–15, 217, 231; for software engineers, 242, 247, 249, 255
- Kim, Sang-Hyun, 17
- labor activism: platform workers criticizing restrictions on, 294; software engineers' views of, 257, 262–63, 270, 271, 304. *See also* strikes and protests
- Labor Contract Law, 77
- labor contracts: for food delivery couriers, 206–7, 208, 211, 213, 216, 219, 221, 222–23, 349n58. *See also* despotic contracts and clauses
- labor displacement, 137–38, 141
- labor-driven development, 32, 33–35, 63
- labor-intensive, export-oriented manufacturing: financial crisis of 2008 and, 4, 23, 82, 169; foreign direct investment and, 172; interviews of actors in, 29; land needed for, 66, 159; local governments' challenges by mid-2000s and, 66; with profits going to multinational firms, 33; workers moving to internet-related sectors from, 28. *See also* obsolete businesses
- labor-intensive manufacturing: considered obsolete in Dongguan and Shenzhen, 106–7; drop in status of, 24; gender division of labor in, 105; moved to Southeast Asia and Africa, 131; research methodology in, 29; robotization to avoid old bird designation,



- labor-intensive manufacturing (*continued*)  
140; South Korea's transition to innovation from, 99; stigmatized by government discourse, 118; Taiwan's transition to innovation from, 99; workers not believing in future for, 122, 124, 126, 193–94. *See also* electronics manufacturers; labor-intensive, export-oriented manufacturing; obsolete businesses; workers at two factories
- labor-intensive services, 195, 195; informal employment in, 195–96, 197, 234. *See also* platform couriers
- labor law: contracts and, 77; overworked software engineers and, 243–44, 252, 263; platform sector and, 274
- labor unions. *See* trade unions
- land: bird/cage logic and, 67–68, 72, 74, 76, 81, 85, 101; collectively owned rural land, 36, 107–8, 110; despotic contracts to buy from the government, 151; of evicted enterprises, 98; high-tech industries and, 72; limited for labor-intensive model, 66; local governments increasing income through, 36, 37, 160
- land-driven development, 32, 35–37, 63
- land-driven economy, 159. *See also* real estate industry
- land finance, 36, 37
- land urbanization, 36–37, 63, 193
- land value, in Shenzhen, 161, 162
- Lareau, Annette, 244
- law: in campaigns against obsolete businesses, 108; definition and examples of, 13; instrumental power of, 13, 14, 70, 185, 301, 313–14; as instrument to advance techno-development, 86; as instrument to control platform workers, 304; in liberal democracies, 57; managers' and executives' complaints about, 150–51; principle of proportionality in, 111–12; rewards and punishments using, 24; shaped by tech giants, 177, 185; technology and, 13–15; Xi's view of, 70; in Yunnan evaluation standard, 61. *See also* environmental law enforcement; regulatory environment; rule by law; rule of law
- Lee Teng-hui, 188
- left-behind children, 34–35, 124, 128, 154, 156, 249, 250
- legitimacy of party-state: capitalist development and, 32; compared to Taiwan and South Korea, 100; lack of large-scale resistance and, 26; performance evaluation systems and, 20, 57, 100; policy disagreements with coastal governments and, 77; primary sources of, 20; relying on economic performance, 303, 307, 314–15; science as a source of, 45; techno-development as crucial means for, 314–15
- Lei Jun, 176
- Lessig, Lawrence, 14
- Li Keqiang, 36, 168, 171, 174, 175, 176, 177, 179, 193, 273, 277
- Lin Zixin, 40
- Li Qiang, 200
- Liu, Jean, 291
- Liu He, 279, 282
- Liu Qiangdong, 176
- Liu Yunfeng, 60
- livestream shopping, 186–87
- Li Yanhong, 176
- Li Zhang, 51–52
- local citizenship. *See* household registration system
- local governments: financing vehicles of, 36, 37, 333n21; food delivery platforms in cogovernance with, 199–200, 231; internet and IT firms hired by, 241; manufacturing FIEs in alliances with, 190; metric systems of, 310–11; nurturing high- and new-tech enterprises, 134; predatory behavior in, 134; software engineers valued by, 233–34; tech firms' power in relation to, 183. *See also* coastal provinces
- low-end capital and labor, 22–23, 301
- low-end industries, 72, 75–76, 80–81
- low-end population, 73–74; internet-created jobs reducing migration of, 193; in Wang's

- developmental model, 79–80. *See also* migrant workers
- low-skilled workers: grim prospects for, 7–8, 13; replaced by technology, 138; robotization and, 7, 166; tech companies' power over, 185
- lying flat, 255, 295–96
- Ma, Jack, 9, 87, 228, 277, 279–80, 281, 285, 316
- Made in China 2025, 84–85, 122, 139, 153, 164, 171
- Ma Huateng, 176, 228
- Manbang, 274–75, 291
- Mann, Michael, 185–86, 187
- manufacturers: new birds after crackdown and, 297; real estate speculation by, 160; wanting fair access to land and credit, 311
- manufacturing: fixed-asset investment in, 161–64, 162, 163, 164. *See also* electronics manufacturers; labor-intensive, export-oriented manufacturing; labor-intensive manufacturing
- Mao Zedong: ideology under, 57, 63; planned economy under, 57, 58; politicized decision-making under, 44; scientists and intellectuals according to, 38–39
- Marcuse, Herbert, 18–19
- market economy: Hu's socialist version of, 50; Ma on planned economy and, 9, 87
- market fundamentalism, 102
- market mechanisms: Jiang on use of, 48; planned economy and, 86–87; preferred by Dongguan entrepreneurs, 80
- marriage. *See* social reproduction
- Marx, Karl, 136
- Marxism, 262
- material conditions: improving, 125, 230, 304; new era of limits and, 320
- Mau, Steffen, 64
- May Fourth Movement, 44
- Mazzocco, Ilaria, 194
- Meituan: among top internet companies in world, 170; fined for behavior toward restaurants, 288; flexible employment created by, 179; food delivery market structure and, 198; instrumental power of, 184–85; local governments and, 183, 199–200; making deliveries during COVID-19 pandemic, 186; Shanghai municipal government and, 200, 233–34; software engineers working for, 233; Tencent and, 198, 287, 347n18; VIE structure of, 173. *See also* food delivery couriers; food delivery platforms
- Meng Wanzhou, 123, 230
- meritocracy, 18, 23, 49, 63, 74, 302, 305
- methodology, 27–31, 323–28
- metrics, 9, 10, 24, 65, 86; of platform companies, 207–8, 231, 232
- metric society, 8, 13
- metric systems: biased against working class, 308; collusion between companies and local officials and, 150; for government support of sharing economy, 176; as obstacles to officials helping manufacturers, 166; optimalists among software engineers and, 249; predatory behavior and, 134; for school access, 130; software engineers' struggles with, 269; technological fetishism and, 166. *See also* evaluation systems; metrics
- microlending, 205, 229, 277–78, 316
- Microsoft, 235, 240, 248, 296
- middle class: growth of platform companies and, 198; software engineers from, 244, 245–49, 270; US professionals from, 247
- middle-class enterprising self, 126, 235
- middle-income trap, 71, 84
- migrant workers: challenging techno-developmental regime, 133; Chongqing Model and, 83; in Dongguan and Shenzhen, 121–22; human capital evaluation systems for, 92; human-robot substitution and, 143; inferior status and benefits of, 34–35; local governments' indifference to fate of, 140, 143; numbers of, 34, 140; Wang on quality of city and, 79–80

- migrant workers' children: access to public school by, 63, 92, 101–2, 128–31, 135, 154, 303, 341n51; allowed to be brought to factories, 122; not wanting working-class jobs, 126
- Milhaupt, Curtis J., 182
- Miller, Chris, 188
- minimalists, 252–57, 264–65, 266, 270
- mobilizational mode of governance, 109
- monopolistic practices. *See* antitrust regulation
- multilateral trade agreements, 4
- multinational firms, 33, 70, 307
- Mu Ouchu, 58
- Nanshan District, 123
- nationalism, 63, 123
- national security: continuing focus on techno-development and, 297–98; crackdown on tech companies and, 291; geopolitical tensions and, 309; internet-related sectors and, 171–72, 173; platform economy and, 176; ride-hailing services and, 175; scrutiny of foreign investment and, 285; tech companies and, 177, 273–74, 275–76, 283
- Naughton, Barry, 139, 172, 297
- Nee, Victor, 82
- neoliberal globalization, 3, 33, 63, 172, 307, 309, 321, 329n13
- neoliberalism in US, 189
- network effects, 180, 345n72
- new birds: boundary-spanning, 180–83; internet companies as, 171; power of, 183–87; real estate industry as, 157, 159, 164; techno-development as, 159
- 996.ICU protest, 235, 251
- 996 working hours, 235, 243, 248, 251, 255, 268, 294
- obsolete business actors: criticizing absence of rule of law, 133; not voicing grievances, 25, 26, 132
- obsolete businesses: background on research sites, 104–7, 105, 106; Xi on elimination of, 70, 108
- obsolete businesses, campaigns against, 108–10; closures and relocations due to, 119–21; implementation of, 110–14, 113; leaving empty factories and buildings, 121; predatory behavior in, 134; public's siding with, 118; regulatory unpredictability and, 114–21; trying to game the system and, 118–19; workers' general support for, 123–24, 133; workers' indifference to, 126
- old birds, 6–10, 15, 23, 71, 73, 77; interaction with local states, 132; subject to market forces and state power, 132; supply-side structure reforms and, 85. *See also* obsolete businesses
- one-child policy, 44, 105
- online ethnography, 29, 30, 237, 325–27
- Opper, Sonja, 82
- optimalists, 245–49, 263, 264–65, 266, 270, 294
- outdated productive forces, 72, 77, 78, 85
- overwork by software engineers, 235, 243–44; accepted for national development, 263, 266; central-level institutional response to, 293–94; choices affected by, 247, 248, 250–51, 260–61; complaints about, 247, 255–56, 260, 266–67
- Pan Gongsheng, 278–79, 289
- Park Chung-hee, 99
- party-state. *See* Chinese Communist Party (CCP); Chinese state
- party-state capitalism, 284
- Pearl River Delta, 29, 77, 80, 82, 104; electronics manufacturing in, 141–42; housing prices in, 158, 159. *See also* Guangdong Province
- Pearson, Margaret, 283
- peasants: arbitrary levies on, 59; defense of employment for, 75–76; in-province, 79–80; Jiang on productive force of, 48; land-lost, 37; sacrificed by government, 130
- peer-to-peer (P2P) lending platforms, 240, 274, 276
- People's Bank of China (PBOC), 276, 278, 282, 286, 289–90

- Perez, Carlota, 4, 187
- performance evaluation systems: for cadre/  
official performance, 58–62, 76, 88, 89–91,  
103; campaigns against obsolete businesses  
and, 109; control and management of labor  
and, 185; critiques of, 58–59, 62; extended  
to numerous sectors of society, 67; Guang-  
dong techno-development and, 77; hiring  
college-educated employees and, 125;  
human-robot substitution agenda and,  
143–44; local protectionism and, 109;  
outmoded businesses and, 132; platform  
companies helping local governments  
with, 199–200; reoriented for techno-  
development, 307; in scientized govern-  
ance, 57–62, 64–65; software engineers  
subject to, 242–44, 251, 260; suggestions  
required to show up on, 148; tech giants  
helped by officials and, 177; two types of  
evaluation in, 336n106. *See also* evaluation  
systems
- performance projects, 58–59
- phoenixes, 6, 70, 71, 81, 84, 85
- planned economy, and market mechanisms,  
9, 86–87
- platform architecture, 206–14, 213, 222
- platform capitalism, 8, 11, 13; in United States,  
188
- platform companies: contractual power to  
control labor, 206–7; creating jobs, 193;  
similarities between the state and, 151;  
unconstrained power of, 222. *See also*  
platform economy
- platform couriers, 29; comparing their factory  
jobs, 127, 227–29; contradictory feelings of,  
227–30, 232; software engineers denying  
responsibility for, 267–69; tech companies’  
power over, 304, 313, 315–16. *See also* gig  
platform couriers (GPCs); service  
platform couriers (SPCs)
- platform economy: algorithms and data as  
regulatory structures in, 14; Chinese state’s  
involvement in, 292–94, 299; creating  
jobs and economic growth, 231; factories  
losing workers to, 127, 153, 168; grievances  
and collective action in, 274–75; labor-  
intensive service jobs in, 195, 196; software  
engineers and, 233; tolerant and prudent  
regulatory principle and, 175–76. *See also*  
platform companies
- platforms: defined, 168; in evaluation systems,  
86; infrastructuralization of, 186–87;  
super platforms (super apps), 180–81, 198,  
240, 345n73
- platform worker guideline, 292–94
- pollution, 50, 66, 72, 78, 85, 124. *See also*  
environmental law enforcement; envi-  
ronmental protection
- populism in US and Europe, 7
- postindustrial society: Bell on, 2–3, 5, 8–9,  
15, 329n9; China’s techno-development  
and, 5; education for, 2; gamification in,  
8; Jiang’s policy for coastal regions and, 49;  
simultaneous development of industrial  
society and, 2, 3
- Power, Michael, 65
- predatory behavior, 133–34
- privacy, 13, 14
- progress, 17, 68
- protests: for access to public school, 128–31,  
135, 341n51; of deindustrialization in 1990s  
and 2000s, 134; government concerns  
about social instability and, 274; of over-  
work by software engineers, 235; rural land  
grabs and, 37, 159; in Yunnan performance  
evaluation, 61. *See also* strikes and protests
- public school access: for children of software  
engineers, 239; migrant workers’ children  
and, 63, 92, 101–2, 128–31, 135, 154, 303,  
341n51; priority for children of property  
owners, 157, 303
- public services: conditions for accessing, 92,  
94, 99, 101; tech companies’ role in, 178, 182
- public sphere: Chinese state’s control of, 21,  
308; rise of internet companies and, 27,  
170; suppression and decline of, 24, 272,  
319; Xi’s concern for national security  
and, 275, 283

- punishments: contributions to techno-development and, 24; for firms in bad categories, 94; legal instruments in allocation of, 313; in performance evaluation systems, 58, 62, 64; performance in human-robot substitution and, 144; scientifically allocated, 307; in social credit system, 64
- Qian Xuesen, 44–45
- Qin Hui, 80
- quantitative analysis of data, 44, 45, 86; central government's decision-making and, 98
- quantitative performance indicators, 61, 88
- Rao, Vijayendra, 21, 318
- rationality: Bell on, 8, 12–13, 18–19, 331n97; contradictions if taken to extremes, 302; formal vs. substantive, 21, 303–4, 311; subjective vs. objective, 21–22, 317; Weber on, 12, 21, 302. *See also* instrumental rationality
- rationalization: contradictions associated with, 21–22; instrumental, 12–13
- Reagan, Ronald, 12, 189
- real estate industry: bank credit for, 160; conversion of empty factories in, 121; debt crisis of developers in, 320; development of, 36, 333n21; fixed-asset investment compared to manufacturing, 161–64, 162, 163, 164; local government revenues and, 36, 120, 313, 316; as new bird, 157, 159, 164, 304; shortage of land for factories and, 66; small manufacturers making money in, 120; speculation in, 37, 63, 159, 160–61, 229
- real estate market reform in 1998, 32
- regime, defined, 10
- regulatory environment: bird/cage logic and, 272; capricious and punitive, 132, 151; favoring platform companies, 127; fetishism of technology and, 317; financial crisis of 2008 and, 27; financial regulation and, 278–79; hyperactive rule making in, 299, 303; mutually reinforcing in US and China, 283–85; officials with lax attitude toward, 281; rewards in, 24–25; state-capital struggles and, 16, 26; tech sector and, 272, 273; tolerant and prudent, 175–76; from tolerant and prudent to zero tolerance, 280, 298; for two major food delivery platforms, 231; unpredictable, 132, 302–3, 311–12. *See also* crackdown on tech sector
- resource allocation: bird/cage logic and, 68, 70, 85, 86, 94, 101; evaluation systems and, 102
- rewards: for firms in good categories, 94; for implementing human-robot substitution, 144; for large tech companies, 24–25; legal instruments in allocation of, 313; in performance evaluation systems, 58, 64; for private capital promoted by the state, 311; scientifically allocated, 307; in social credit system, 64
- ride-hailing market, 174–75
- Rithmire, Meg, 283–84
- robotization: to alleviate labor-related problems, 145–46; Chinese state's aspirations for, 138–41, 165–66; electronics manufacturers and, 7, 141, 144–50, 152–54, 155–57, 166; Germany as model for, 139, 153; local governments and, 142–44, 300; overestimated potential of, 146–47; unemployment and, 137, 141; workers and, 152–54, 167. *See also* automation
- robots: defined, 136; limited compared to human dexterity, 146–47, 166–67; replaced with humans by Toyota, 149; symbolic meaning of, 149
- Rozelle, Scott, 8, 194
- rule by law, 20, 285, 308, 313–14, 320
- rule of law: contradictory regulatory environment and, 303; managers and executives wanting, 150–52; manufacturers wanting, 166, 311; in South Korea and Taiwan, 307–8; unstable legal environment and, 115, 116, 133

- rural population. *See* migrant workers;  
peasants
- rural targeted poverty alleviation, 102
- Schumpeter, Joseph, 6–7, 12, 15
- science and technology (S&T): Bell on role of, 2, 8; Chinese attitudes toward, 52, 53–55, 56; Clinton on US–China partnership in, 1; enthusiasm in Chinese society for, 52; fetishization of, 26; Marcuse on political power and, 18; saving China with, 39, 63, 69, 78; technical rationalization and, 13; techno-developmentalism and, 32–33, 38–39; techno-developmental regime and, 10; technology fundamentalism and, 102; techno-nationalism and, 17; US attitudes toward, 335n100; world attitudes toward, 52, 53–55, 56, 335n100. *See also* techno-development; techno-developmentalism; technology
- science and technology studies, 17, 52
- scientific concept of development, 49–51;  
bias against working class and, 73–74;  
bird/cage logic and, 67; erosion of Hu’s vision for, 319; evaluation systems based on, 59–60, 64; Wang’s application to Guangdong, 78; Xi’s use of, 71
- scientific decision-making, 44–45, 48, 177, 178
- scientific management: Jiang on, 48; performance evaluation systems in, 57–58, 62, 64
- scientific ruling, 49–50
- scientism, 51–52, 69
- scientization: of birdcage economy, 67–76;  
of statecraft, 56–62, 64–65, 86, 132, 177, 199, 335n104
- Scott, James C., 16–18, 22, 63
- second-tier cities, 240, 241, 350n23
- self-strengthening movement, 38
- semiconductor industry, 12, 14, 28, 41, 98–99, 187–89
- Sen, Amartya, 21, 318
- service platform couriers (SPCs), 203–5;  
communication between, 208, 209;  
grievances of, 214–19, 215, 218; performance metrics of, 207–9. *See also* food delivery couriers
- service platforms, 207–9, 213
- service sector: growth of employment in, 195, 195; low-skilled jobs in, 138; manufacturing workers wanting to move to, 153, 154; workers disappointed with, 127. *See also* platform economy
- Shandong, 34, 68
- Shanghai: bird/cage logic and, 68, 72;  
collaboration agreement with Meituan, 200, 233–34; cooperation agreements with Alibaba and Tencent, 178; difficulty obtaining local citizenship in, 239; shortage of land for manufacturing, 66; tech companies concentrated in, 240
- shanzhai, 27, 29
- sharing economy, 175–76
- Shen, Xiaobai, 52, 63–64
- Shenzhen: access to factory in, 29, 323;  
conversion of closed factories in, 121; demography of, 104–7, 105, 106; difficulty of obtaining local citizenship in, 239; evaluation instruments in, 87, 92; factory worker becoming platform courier in, 228; faking a high- and new-tech certificate in, 119; fixed-asset investment in, 161–62, 162, 163; high real estate prices in, 121; Household Registration Scheme, 92, 94, 95–97; housing prices in, 158, 159; industrial transformation and, 72; land value in, 161, 162; low-end population in, 73; real estate investment in, 161, 161, 162, 163; robotization in, 7; special status and resources of, 104; tech companies in, 240; workers at Jade in, 121–22
- Silicon Valley, 169, 187–88, 189, 263
- Singapore, 5
- skill-intensive services, 195, 195, 197. *See also* software engineers
- small and medium-sized enterprises (SMEs): development policy criticized in, 74–75, 80; financial crisis of 2008 and, 77–78, 81;

- small and medium-sized enterprises (SMEs)  
(*continued*)  
government discrimination against, 117;  
internet and IT companies among, 240–41;  
manufacturers recast as obsolete, 7;  
pollution not addressed by, 72; refined,  
specialized, and novel, 355n111; Xi's  
preference for large enterprises over, 70
- smart cities, 98, 178, 179, 182, 200, 339n86
- smart decision-making platform, 98
- social classes: boundaries between couriers  
and management based on, 226; coding  
elite, 15, 234 (*see also* software engineers);  
cybertariat, 15, 235, 269, 271; discrimination  
based on, 94, 101–2, 135, 303, 312; intellectu-  
als after Cultural Revolution and, 40–41,  
42; in postindustrial society, 15; software  
engineers' origin and, 238, 244, 269–70;  
urbanization and, 101. *See also* inequality;  
working class
- social credit system, 28, 64–65
- social Darwinism, 68, 74
- social forecasting, 45
- social indicators movement, 62
- socialism: class-based discrimination con-  
flicting with, 312; Deng's reinterpretation  
of, 39, 42; ideas on techno-development  
and, 63; stated commitment to, 303
- social media: crackdown on, 275, 294;  
online ethnography in, 29, 30, 237, 325–27
- social mobility. *See* upward social mobility
- social protection, 51, 60, 312. *See also* social  
welfare
- social reproduction: defined, 24; resource  
allocation for, 28; rewards for, 24; rising  
costs of housing and, 37, 63, 159; rural  
migrant workers and, 35, 63; software  
engineers and, 237–39, 245–46, 249, 253–54,  
255, 257–59, 261, 269–70, 355n107
- social stability: Chinese state's concerns  
about, 171–72, 274–75, 283, 299; regulatory  
environment and, 175, 176; Xi's view of  
inequality and, 295; Xi's view of platform  
economy and, 293
- social welfare: disadvantaged groups and, 312;  
household registration status and, 143;  
Hu's leadership of CCP and, 50; inferior  
rural system of, 69; limited under techno-  
development, 102; in South Korea, 100;  
Xi's limiting of state's responsibility for,  
296, 303. *See also* social protection;  
welfare state
- sociotechnical imaginaries: fetishism of  
technology and, 317; reassessment of, 310;  
robotization policies and, 140–41, 149,  
165–66; in views of young workers, 153
- soft science, 44–45
- software engineers: Chinese state's effort to  
show concern for, 293–94; in coding elite,  
15; control and management of, 242–44;  
denying responsibility for platform  
workers' plight, 267–69, 271; female, 237,  
249, 350n15; four types of, 244 (*see also*  
*specific types*); functions performed by,  
233; heterogeneous class origin of, 238,  
244, 269–70; highly valued by state and  
tech capital, 233; interviewees' character-  
istics, 236, 237; interviews with managers  
of, 30; Jiang on need for, 43; labor market  
for, 239–42; online protests by, 303; pri-  
oritizing development over labor rights,  
263, 266–67, 270–71; rank-and-file vs.  
CEOs, 269; remuneration for, 239–40, 241,  
242–43, 252, 258, 260; research methodol-  
ogy with, 326–27; responding to crack-  
down, 294; robotization and, 155; seeing  
prospects for themselves, 168; from  
selective universities, 241–42; with social  
mobility, 238, 251; in US and India, 244,  
267; vulnerable to exploitation, 304.  
*See also* overwork by software engineers
- Solow, Robert, 137
- Somers, Margaret, 102
- Song Jian, 44–45
- Songshan Lake, 123, 130
- South Korea: differences from Chinese de-  
velopment, 4, 10, 11, 19; middle-income trap  
and, 71; techno-developmental regime

- of, 305–8, 306; techno-development in, 98, 99–100, 132, 187, 188
- special economic zones (SEZs), 47, 104
- Srnicek, Nick, 188
- State Administration for Market Regulation (SAMR), 286–89, 299
- state-capital-labor-technology relationship, 140, 149
- state capitalism, 181–82, 284
- state-owned enterprises (SOEs), 181–82; banks' privileging of, 150–51, 160; equipment purchases required from, 114, 116; internet and IT firms hired by, 241; Jiang on, 47; performance evaluation in, 57–58; preferences for, 150–51, 166; private enterprises crossing boundary with, 182; real estate speculation by, 160; reducing debt of, 282; restructured in late 1990s, 134, 180; role of, 181–82
- Stone, 112–14, 116
- strike hard against crime campaigns, 109, 112
- strikes and protests: illegality of, 227; by platform couriers, 214, 215, 217, 218, 218, 223–27, 225, 304; by truck drivers, 274. *See also* protests
- strivers, 249–52, 264–65, 270
- super platforms (super apps), 180–81, 198, 240, 345n73
- supply-side structure reform, 84–85, 160
- surveillance capitalism, 8, 11, 13, 184, 190, 234, 267
- surveillance state, 15
- survival of the fittest, 68, 74
- sustainable development, 1, 49, 51, 61, 275, 297
- Taiwan: differences from Chinese development, 4, 10, 11, 19; female manual labor in, 105; middle-income trap and, 71; mobility from workers to factory owners in, 126; techno-developmental regime of, 305–8, 306; techno-development in, 98–99, 100, 132, 187, 188
- Taobao, 278, 345n73
- targeted poverty alleviation, 102
- target management responsibility system, 57–58
- tax benefits for enterprises, 88, 139
- taxes from livestream shopping, 186–87
- Taylor, Frederick W., 57–58
- tech companies: accessing global financial capital, 172–74, 183, 307; ban on foreign investment in, 173; boundary spanning by, 180–81, 182, 183, 185–87, 191, 199–200, 281–82, 298; building big data platforms for Chinese state, 233; CEOs of, 235; in China's state capitalism, 182; cities with concentrations of, 240; contradictions between state and, 25–26; cultivated by Chinese state, 4–5, 24; financial businesses of, 277–79; founded around 1998, 4; global financial capital for, 173–74, 183, 273, 276; as global investors, 181, 240; infrastructural power of, 183, 185–87; instrumental power of, 12, 13, 183–85; IPOs of, 4–5, 169–70, 173, 183, 198, 291, 299; law-based power of, 177, 185; local, national, and global scales of, 182–83; lower echelon of, 240–41; in making of the cage, 9, 22, 23; mergers and acquisitions by, 181, 198; monopolistic power of, 299; partnerships with Chinese state, 176–80, 183, 184, 186–87, 190–91; platform couriers' views of, 230; policy environment for, 171–72; regulatory tolerance and, 172–76, 192; rise of, 169–70; separate from US-dominated internet, 172; start-ups among, 240; state's rewards for, 24–25; state's struggle to curb power of, 26; tremendous gains before crackdown, 272–73; in United States, 8–9, 185, 189–90, 191–92; US restrictions if China-based, 284–85; Xi's common prosperity agenda and, 295. *See also* crackdown on tech sector
- technicians, 155, 156, 157, 161, 167
- techno-development: authoritarianism of Chinese state and, 19–20; characteristics of, 22–23; in China compared to South Korea



- techno-development (*continued*)  
and Taiwan, 4, 10, 11, 19; contradictions in, 21–22, 25–26; critical voices in, 103; defined, 4; law in planning and control of, 13–14; local emergence of, 7, 23–24, 26, 32, 34, 67; as postindustrial transformation, 5; rewards and punishments in, 24–25; software engineers' support for, 270–71; state's planning and control of, 9–10, 19–20; still the solution following crackdown, 296–98
- techno-developmentalism: debates and tensions associated with, 63–64; defining characteristics of, 32–33, 37–39; Deng Xiaoping and, 39–42, 46; Hu Jintao and, 39, 49–51; interviewees' appreciation for Chinese state and, 304; Jiang Zemin and, 39, 43–49; meritocracy in, 305; officials disregarding risks under, 281; social inequality and, 74; societal attitudes toward, 51–52, 53–55, 56, 64
- techno-developmental regime: basic characteristics of, 10–11; bias against working class in, 74; challenged by migrant workers with children, 133; comparative perspective on, 305–10, 306; consolidation of, 81–85, 132; contradictions in, 301–5, 308; different types of techno-development and, 63; expansion of instrumental power in, 301; ideas and beliefs about instruments in, 316–19; instrumental apparatus of, 132; precarious instrumental rule in, 316; rampant predatory behavior in, 133–34; shielded from criticisms, 24
- technology: critiques of, 52; defined, 13; democratization and, 27; fantasy of dominating nature by, 18; instrumental power over people and, 3, 8; Jiang's warning about dependency in, 48; law and, 13–15; material limitations of, 166; optimism and pessimism about, 16; used to justify inequality, 18. *See also* intellectual technology; science and technology (S&T); techno-development
- technology fundamentalism, 102
- technology transfer, 1
- techno-nationalism, 17, 23, 38, 230, 302
- techno-state capitalism: basic characteristics of, 22, 170; compared to South Korea, Taiwan, and US, 187–90; dependency of the state on big tech firms in, 190–92; instrumental apparatus expanding in, 231–32; instrumental power expanding in, 301; labor-intensive service employment in, 196; local, national, and global scales in, 183; power of tech companies and, 308. *See also* crackdown on tech sector; digital capitalism
- techno-utopianism, 16
- Tencent: among top internet companies in world, 170; bargaining power with local governments, 183; blurred boundary with Chinese state, 182; competing with Alibaba, 172; disinvestment responding to SAMR action, 287; founding of, 4, 169; genders of employees at, 237; infrastructure power of, 186; investments of, 181; IPO of, 169; location of, 27, 123; Meituan in ecosystem of, 198, 347n18; partnership with Chinese state, 176–78, 179; regulatory environment and, 174; VIE structure of, 173
- three represents, 48–49
- Tiananmen democratic movement, 1, 39, 43, 44, 45, 102
- tier classification of cities, 193, 240, 347n4, 350n23
- tiered development theory, 46–47, 71
- TikTok, 230, 284
- Tirole, Jean, 168
- Toffler, Alvin, 16
- trade unions, 190, 223, 229, 231, 275, 293, 294
- truck drivers, protests by, 274–75
- truck services, of Manbang, 291
- Trump administration, 284
- Tsai, Kellee, 284
- Uber, 175, 203, 206, 207, 219, 223, 349n70
- Uber Eats, 198, 203, 210, 212
- unfair competition, 150–51, 280, 288–89

- United States: commercialization of internet in, 187–88; few constraints on tech giants in, 314; global digital capitalism of, 189–90, 307, 308; as hidden developmental state from 1980s to late 2010s, 12, 189, 309–10; seeking to control China's options, 321; techno-developmental regime of, 306, 308–10. *See also* Clinton, Bill
- universities, hierarchy of, 241–42
- upward social mobility: of engineers in manufacturing, 156–57; new era of limits and, 320; of software engineers, 238, 251
- urbanization: growth of platform companies and, 198; of land, 36–37, 63, 193; migrant children's access to school and, 101–2; performance evaluation including, 61; of population, 36
- US-China rivalry: in digital capitalism, 189; disguised US developmental state and, 12; platform couriers' view of, 230
- US-China tensions: data security and, 290; now rising, 321; regulation of tech giants and, 280, 281
- US-China trade agreement, 1
- US-China trade war, 123, 127, 172, 283
- US securities regulation, 284–85
- valuation systems, 86
- variable interest entity (VIE), 173, 183, 276, 284, 287
- vocational certificates, 134
- vocational schools, 124–25, 126, 128
- wages: household registration system and, 34–35; in informal employment, 195; piece rates for gig platform couriers, 219–20, 223–24, 226; relocation of manufacturers to other countries and, 166; rising in the 2010s, 34; for service platform couriers, 216, 218; for software engineers, 239–40, 241
- Wang Yang, 73, 77–80, 81, 83–84
- Wan Li, 44
- Washington Consensus, 11
- waste of public resources, 148, 150, 166, 302, 317
- Weber, Max, 12, 18, 21, 302
- Weberian bureaucracies, 310
- WeChat, 178, 180, 183, 198, 345n73; platform couriers on, 209, 212, 216, 222, 224, 225, 294; software engineers on, 237
- welfare state: Bell on role of, 8; of Taiwan and South Korea, 99–100, 307–8
- Wen Jiabao, 59, 78, 84, 102
- Wenzhou, FIEs in, 74–75
- Western imperialism, 38, 39
- Whittaker, D. Hugh, 187
- Williams, Robin, 52, 63–64
- Wilson, Harold, 17, 136–37
- workers: in businesses relocated inland, 120–21; in China's rust belt in 1990s and 2000s, 134; going from factories to platforms, 194; human-robot substitution and, 152–54; tech companies in control and management of, 184–85; views of automation, 137. *See also* low-skilled workers
- workers at two factories: approving of legal enforcement campaigns, 133; characteristics of, 121–22; with children, wanting access to schools, 127–31; with comfortable urban lifestyle, 125; complaining about boring jobs, 125–26; disappointed with service-sector jobs, 127; discontent among, 127–31; gaming systems to survive, 128–29; high-end vs. low-end classification used by, 122–23; nationalist sentiments among, 123; supporting S&T-oriented development, 123, 134–35; views of industrial upgrading, 122; without children, 124–27, 135, 194
- working class: Chongqing Model and, 83–84; classification systems biased against, 308; discrimination against, 94, 101–2, 135, 303; increasing denunciation of, 126; IT-related workers coming from, 237–38; meritocracy accepted by some members of, 305; sacrificed by government, 130; seen as low-quality, 73–74; software engineers coming from, 244, 248, 249–52, 252–57, 257–59, 270; subject to expanding instrumental apparatuses, 232; subject to harsh instrumental rule, 15; wanting their children to enter middle class, 126

- World Trade Organization (WTO):  
China's accession to, 1, 70, 329n11;  
foreign direct investment and, 172;  
neoliberal globalization and, 3, 33,  
329n13
- Wu, Jieh-min, 114–15
- Wu Jinglian, 74–75, 80–81
- Wu Lengxi, 41
- Wu Mingyu, 40
- Xi Jinping, 23; anticorruption campaigns of,  
111, 133; bird/cage logic and, 70–71, 83–85,  
100–101, 108; on China dream, 122; com-  
mon prosperity slogan of, 69, 100, 294,  
295, 303; critical voices disempowered  
under, 103, 118; efforts to curb local power  
under, 133–34; environmental protection  
and, 84, 108; financial risks and, 274, 279;  
future of China and, 320, 321; internet  
and, 170, 172; law under leadership of, 1  
33; national security and, 273–74,  
275–76, 283; risk management and, 273;  
rural targeted poverty alleviation and,  
102; tech giants communicating with,  
177; techno-developmental regime  
and, 301; three 2001 publications by,  
68–70; Zhejiang's developmental policy  
and, 68
- Yan Fu, 68–69, 74
- Yangtze River Delta, 29, 46
- Yunnan, performance evaluation system, 61–62
- Zhang, Angela, 174, 276
- Zhang Bei, 73
- Zhao, Dingxin, 57
- Zhao Ziyang, 43, 44, 45, 334n64
- Zhejiang: bird/cage logic and, 68, 70–71,  
80–81, 84, 94; financial crisis of 2008 and,  
80–81; fixed-asset investment in, 164, 165;  
platform businesses in, 180; as research  
site, 104; robotization and, 7, 139–40; rural  
migrant workers in, 34; shortage of land  
for manufacturing, 66; small and medium-  
sized entrepreneurs in, 74; unstable regu-  
lation of obsolete businesses in, 116; Xi's  
elimination of obsolete businesses in, 108
- Zheng, Wentong, 182
- Zhengzhou, 120
- Zhongshan City, 92
- Zhou, Dingxin, 20
- Zhou, Xueguang, 20, 109, 285
- Zhou Enlai, 40
- Žižek, Slavoj, 5
- Zuboff, Shoshana, 5, 8–9, 184, 185, 190,  
191–92, 234, 300, 314
- Zysman, John, 14