CONTENTS

List of Figures and Tables vii

Preface and Acknowledgements xi

Introduction: How to Restart the Century 1

PART I. WHAT'S GONE WRONG, AND WHY? 19

1 The Great Economic Disappointment 21

2 The Economic Crisis Is an Intangibles Crisis 63

3 The Intangibles Crisis: Institutional Failure 82

PART II. FIXING OUR CHANGED ECONOMY 119

4 "The Progress of Science and Useful Arts": Reforming Public Investment and Intellectual Property 121

5 Financial Architecture: Finance and Monetary Policy in an Intangibles-Rich Economy 148

6 Making Cities Work Better 183

7 Reducing Dysfunctional Competition 211

Conclusion: Restarting the Future 240

Notes 263

References 279

Index 297

Introduction

HOW TO RESTART THE CENTURY

The twentieth century ended in a flurry of optimism. New technologies and new ways of doing business would, it was hoped, soon usher in great advances in prosperity and human flourishing. But the reality has proved very different. Over the past twenty years the performance of advanced economies has been a study in disappointment. This book proposes a new explanation for what went wrong, suggesting how we can fix the problems and create an economy that not only grows faster but is fairer and more sustainable, too.

Postponing Tomorrow: Selden's Brass Plaque and Lorenzetti's Fresco

Sometimes a future that in retrospect seems inevitable was at the time a close-run thing. And sometimes a future that seems desirable and likely does not happen at all. One way of thinking about this is by considering two old objects: a brass plaque in the case of the automobile and a seven-hundred-year-old painting.

Perhaps more than any other technology, the automobile defined the twentieth century. For better or worse, it influenced our lifestyles, our economy, our cities, and our climate. Even at the very beginning of the century, people saw it as an icon of the future. But if you look at vintage American automobiles from around 1900, you'll see that many of them share an unusual feature: a brass plate stating that the car is the design of a man named George Selden. If you have not heard Selden's name alongside automotive pioneers Karl Benz or Henry Ford, there is a reason for this. Selden was not an engineer but a patent attorney, and at the time he had not produced a single car. But he did file a patent in 1879 that he claimed covered all gasoline-powered cars (US patent 549,160).[1] He made the most of this patent, forming in due course a cartel with a number of other businesses to demand royalties from every car sold—a precursor of the patent trolls who acquire obscure patents and use them to shake down tech companies today. A dynamic industry looked like it might fall victim to a greedy collective. Several years later, Henry Ford challenged the patent, eventually prevailing after an eight-year lawsuit, and the rest was history. But the situation could have turned out differently, moving the American auto industry onto a different path and affecting the wider history of the motorcar, too. The brass plaque is a reminder that the development of the automobile was not, in fact, a sure thing.

Patent wars have not been limited to the auto industry. America's aviation industry was defined, and nearly derailed, by a similar patent war only a few years later. Hollywood is synonymous with cinema in part because early moviemakers went there to escape the legal constraints of Thomas Edison's Motion Picture Patents Company. These patent wars are examples of

the broader historical lesson that the evolution of many new technologies, and their economic consequences, depended on good fortune in terms of rules, laws, and institutions.

Selden's brass plaques are a reminder of a lucky economic escape from bad rules that nearly held back a major technology in its earliest days. But sometimes society is not so lucky, and bad institutions bring material progress grinding to a halt. A popular attraction in the city of Siena is a set of stunning frescoes by Ambrogio Lorenzetti (active approximately 1317–48) depicting the city as it was in the fourteenth century, with towers and marketplaces picked out in rose pink and mauve, delicately painted merchants plying their trade in the streets, and happy citizens dancing. The title is *The Effects of Good Governance on Siena and Its Territory*. It is located in the Palazzo Pubblico, on the wall of the chamber where the city's ruling council sat, and it makes a basic political point: good governance helps an economy flourish. And where better to paint it? In the early 1300s, it must have seemed that Siena and the surrounding cities of northern Italy had pulled off a remarkable economic feat. By supporting trade, finance, and investment, they had begun to break out of the trap of subsistence in which most of western Europe had been stuck for centuries. But even as the paint on the fresco was drying, the economic tide was beginning to turn. The institutions that had helped Siena prosper turned out to be inadequate for the new economy. Like many other northern Italian cities, Siena began to stagnate and then decline. The frescoes in the Palazzo Pubblico stand as a melancholy reminder of what had been.

The Sienese experience raises an important question that we will explore in chapter 3: What institutions, norms, and strategies does the economy need as it grows and changes?

The Great Economic Disappointment and Its Symptoms

When we think about the state of the economy today, it is hard not to think, *it wasn't supposed to be like this*. The world is richer than it has ever been, remarkable technologies are transforming every facet of our lives—and yet, everyone seems to know that, from an economic point of view, *something is wrong*.

In Britain in the late 1970s, the *something wrong* was so obvious that it earned itself a name: Britain was described as "the sick man of Europe." No one has given a name to the problems that the economies of rich countries face today, but we see five symptoms in country after country: stagnation, inequality, dysfunctional competition, fragility, and inauthenticity. These symptoms are noteworthy not only because they are objectively undesirable but also because they are all somewhat hard to explain, defying traditional economic explanations or exhibiting unexpected paradoxes. We introduce them briefly here and explain them in more detail in chapter 1.

Stagnation. Productivity growth has been dismally slow for over a decade. As a result, rich countries earn about 25 percent less per capita than they would have earned if twenty-first-century growth had continued at trend rates. Periods of low growth are not in themselves unusual, but our current slump is both protracted and puzzling. It has proved resistant to ultra-low interest rates and a host of unconventional attempts to stimulate the economy. And it coexists with widespread enthusiasm about new technologies and new businesses that exploit them.

Inequality. Whether you measure it in terms of wealth or income, inequality has increased considerably since the 1980s and has stayed constant. But inequality today is not simply a matter of haves and have-nots. Rather, it is complicated by what

we might call *inequality of esteem*: a perceived divide between high-status elites and low-status people left behind by cultural and social change. Although there is some correlation between esteem and material affluence, this correlation is not perfect. Many people who feel left behind by modernity are asset-rich retirees, while the liberal elite includes plenty of impecunious, debt-saddled graduates.

Dysfunctional Competition. The lifeblood of market economies, competition does not seem to be working as it should. The fortunes of firms seem to be more entrenched. Trillion-dollar businesses such as Amazon and Google consistently outperform laggards, earning sky-high profits. Fewer new businesses are set up, and people are less likely to change employers or move to find work. Here, too, we see a paradox as many people complain of a growing sense of frenetic, stressful, and wasteful contestation in economic life, with the objectively affluent, and even the rich, seeming to have to work harder and harder to keep up.

Fragility. The COVID-19 pandemic has shown that even the world's richest economies are not immune to natural forces. Indeed, the damage caused by the pandemic is linked to the complexity and sophistication of the economy. Our large, dense cities, our complex international supply chains, and the unprecedented interconnectedness of our global economy allowed the virus to leap from country to country and increased the cost of the lockdowns needed to control it. Even fifteen years ago, a pandemic outbreak in a remote area of China would be at most a minor news story for the rich world. Now, thanks to globalisation, supply chains, and the internet, we seem to be increasingly exposed to the mere flap of a butterfly's wings on another continent.

For many, the ruinous human impact of COVID-19 offers a forewarning of the havoc that climate change will cause in the

years to come. The combined actual impact of the pandemic with the expected impact of global warming illustrates the vulnerability of the economy to big, ecosystem-level threats. Both problems share another feature: the curious gap between knowing how to solve them and actually doing so. Countries from Taiwan to Thailand have shown that the right policies can help to reduce the number of COVID-19 deaths and the amount of economic damage. Likewise, detailed and credible plans for decarbonising the economy exist. But the gap between knowing and doing is wide, and most countries seem unable to bridge it.

Another indication of fragility is the declining ability of central banks to offset economic shocks. In the nine US recessions leading up to the COVID-19 pandemic, the Federal Reserve cut interest rates by an average of 6.3 percentage points.[2] In the United Kingdom, the cut was 5.5 percentage points in the five pre-COVID-19 recessions. But since 2009, average interest rates set by the Central Bank in the United States, the United Kingdom, and Continental Europe have been 0.54 percent, 0.48 percent, and 0.36 percent, respectively (data to April 2021). On interest rates, so-called policy space for central banks seems severely limited.

Inauthenticity. The final disappointing feature of the economy in the twenty-first century is not something that economists talk about, but it looms large in laypeople's discussions. We call it *inauthenticity* or *fakeness*: the idea that workers and businesses lack the grit and authenticity they should have, and that they once had. Consider anthropologist David Graeber's critique of "bullshit jobs": "Through some strange alchemy, the number of salaried paper-pushers ultimately seems to expand" even while "the lay-offs and speed-ups invariably fall on that class of people who are actually making, moving, fixing, and maintaining things."[3]

Graeber's critique follows in the footsteps of postmodernists such as Jean Baudrillard, who argued that the modern world is dominated by "simulacra": imitations and symbols that, like Disneyland, take on a new life of their own that is detached from the underlying reality.[4] Likewise, the conservative commentator Ross Douthat has argued that one of the characteristics of modern decadence is the prevalence of imitation rather than originality in culture, media, and entertainment. The modern world is remixed, narrated, and curated in a way that the past was not.[5]

This view resonates with the public, too. Manufacturing, along with the idea that governments should do more to promote it, is perennially popular with voters. Bringing back manufacturing jobs to the United States was one of Donald Trump's most resonant electoral promises in 2016. Successive British governments promised to respond to the global financial crisis with "New Industries, New Jobs" and a "March of the Makers." None of these promises were kept, but the fact that they were made at all strongly indicates the popularity of the idea that we should return to "making things" and the suspicion that a lot of modern economic activity is somehow not genuine.

Economies and societies have often gone through periods of unease. But the coexistence of the five problems listed here is particularly puzzling and paradoxical. Economic stagnation has affected us before. But today it coexists with low interest rates, high business profits, and a widespread belief that we live in an age of dizzying technological progress. The rise of material inequality has slowed down, but its consequences and sequelae—inequality of status, political polarisation, geographical divides, blighted communities, and premature deaths[6]—continue to grow. And, as we discuss in chapter 7, competition seems to have decreased, with fewer new firms and more

persistent performance gaps between leader and laggard businesses. But working life for managers and workers alike feels more frenetic than ever.

This book answers two key questions: What is causing all these symptoms, and what can we do about it?

Explaining the Great Economic Disappointment: Conduct versus Circumstance versus the Transformed Economy

When things go terribly wrong, there is rarely a shortage of theories to explain why. As we discuss in chapter 1, the explanations offered for the Great Economic Disappointment tend to fall into two groups: theories that blame conduct and theories that blame circumstance.

Conduct explanations hold that we could have avoided our problems if we had acted better. Critics on the left argue that we should have undone neoliberalism with higher taxes or stricter competition law; critics on the right blame the decline in entrepreneurial spirit and lament a lost culture of "building." *Circumstance* explanations are more fatalistic. Some of them argue that the issues we face today are just the manifestation of long-standing failings, the chickens of capitalism coming home to roost. Others maintain that stagnation is the inevitable consequence of progress, perhaps because historical growth rates depended on technological good luck—for example, transformational inventions such as the internal combustion engine, electrification, television, and indoor plumbing—and we are simply not so lucky in the technologies available to us today. Some circumstantial explanations are pessimistic, maintaining that the past two decades represent a new normal; others are more optimistic, predicting an improvement in the future as we discover ways to make new technologies productive.

We are sceptical of theories that rely on the assumption that humanity has simply gotten worse or that providence or the great unfolding of technology has simply turned against us. This book provides an alternative explanation. We believe that the economy is partway through a fundamental change from one that is largely material to one that is based on ideas, knowledge, and relationships. Unfortunately, the institutions on which the economy depends have for the most part failed to keep pace. The problems we see are the morbid symptoms of an economy caught between an irrecoverable past and a future that we cannot attain.

We documented the transformation from a largely material economy to one based on ideas, knowledge, and relationships in our 2017 book, *Capitalism without Capital*. There we noted the shift towards investment in intangible assets (such as software, data, R&D, design, branding, training, and business processes). This shift has been ongoing for more than four decades. As we show in this new book, this change in itself explains some of the features of the Great Economic Disappointment, from rising inequality of esteem to the persistent gap between leader firms and laggard firms.

As we were writing *Capitalism without Capital*, we became aware of a totally unexpected aspect of the story of intangible capital. It seemed that around the time of the financial crisis, the long-running growth of intangible investment was beginning to slow. This slowdown was totally unexpected. After all, intangible investment had been growing reliably for decades. Intangible investments, such as software and R&D, and the intangible benefits of platforms, networks, and strong brands were only becoming more important to businesses. Intangibles-rich firms were increasing their dominance of the world's stock markets, and at a micro level the demand for intangible

investment showed no sign of waning. Initially we assumed that the slowing growth of intangible investment must be a temporary consequence of the global financial crisis. But as more data became available, it became clear that the downturn was not temporary. It has now been with us for a decade, and we believe that it explains a significant proportion of the decline in productivity growth over the period.

An Unfinished Revolution

Our proposition, which we detail in chapter 3, is that the underlying problem is one of *inappropriate institutions*. Economists and laypeople alike generally accept that economic activity depends on institutions, what Douglass North described as "the humanly devised constraints that structure political, economic, and social interaction" or what Arnold Kling and Nick Schulz called the "operating system" of the economy. Sound institutions enable exchange: trade, investment, and specialisation that make the economy progress. Sound institutions have to solve four problems in exchange: ensuring sufficient *commitment*, solving *collective-action* problems, providing *information*, and restricting wasteful *influence activities*.

The key problem is that because intangible capital has unusual economic properties, institutions have to change to accommodate them. Consider, for example, the increased need for collective action: public institutions that fund intangibles that businesses are reluctant to fund, such as basic scientific research or vocational training, become more central to economic policy. Also consider the increased need for information: capital markets and banking systems must be able to lend to firms whose assets are difficult to use as security for loans.

Simultaneously, wasteful influence activities increase: there are more lawsuits around intellectual property, which grants ownership over certain intangible assets, and dysfunctional arguments over planning and zoning occur in the densely populated areas where intangible investment seems to thrive. Without the right institutions, two problems result: (1) worthwhile intangible investments are not made, resulting in slower growth, and (2) the potential downsides of an intangibles-rich economy go unchecked.

We can use the metaphor of a catalyst in chemistry to think about why institutions that were adequate for increasing intangibles to around 15 percent of a country's GDP cannot support a further increase. (We apologise to economic purists who object to this metaphorical reasoning, while noting that economics is loaded with metaphorical concepts already.) Brewers and winemakers know that yeast produces zymase, an enzyme that catalyses a reaction that turns sugar into ethanol and carbon dioxide. However, once the alcohol concentration of a fermenting liquid creeps up beyond 15 percent, the yeast dies and the zymase on which the reaction depends is no longer produced. Yeast will make wine, but not brandy; beer, but not whisky. Chemical engineers speak of the more general phenomenon of catalyst poisoning, in which catalysts are rendered less effective by impurities or the by-products of the reactions that they enable.

The institutions on which the intangible economy relies seem to behave in the same way. In some cases, intangible-friendly institutions exist only in small parts of the economy and are impractical to scale up. One example is the venture capital industry, which provided early-stage finance for many of the largest intangible-intensive firms. In other cases, flaws and kludges that were only minor problems when intangibles

represented a small part of the capital stock become more problematic as intangible capital becomes more important. Patent wars caused by poorly designed intellectual property regimes, research fraud by academics trying to meet publication targets, and planning disputes that prevent clusters from growing are all bigger problems in today's world than they were in 1980.

In other cases, the consequences of a more intangible economy—such as rising inequality or the political consequences of the growing gap between liberal elites and the left-behind masses—serve to weaken the institutions on which an intangible economy relies. Voters angered by the rise of intangibles-rich elites elect populist governments, which cut funding for institutions that produce intangible investment, such as scientific research. Businesses that have achieved market dominance through valuable software or networks fund lobbying to make life harder for competitors, discouraging those competitors from investing. As a result, the cost of inadequate institutions rises.

As intangibles become more important, the institutions on which our economy depends begin to look like the legacy software systems found in large banks or government departments: outmoded in their architecture and increasingly costly, a situation that software developers call *technical debt*. At first, the shortcuts, architectural compromises, and workarounds can be lived with, but over time their costs increase, and eventually the system fails if the debt is not paid down. Technical debt rarely intrudes into the public consciousness—perhaps the most famous example is the Millennium or Y2K Bug, which cost hundreds of billions of dollars to fix—but it lurks in countless pieces of software on which we all rely daily. The growing importance of intangibles has created a bigger and more pervasive version of technical debt that we call *institutional debt*.

Paying Down Our Institutional Debt

In the second half of this book, we look at four areas where our institutional debt is greatest, holding back future intangible investment and exacerbating the problematic effects of the intangible investment that already takes place.

Public Funding and Intellectual Property. The most obvious problem relates to institutions whose explicit purpose is to encourage intangible investment. Intellectual property (IP) laws and public bodies that fund research, training, or cultural content all work to solve one of the main quirks of intangible capital: the fact that it generates spillovers, reducing the incentive for private firms to invest as much as they otherwise would. Accordingly, as we discuss in chapter 4, governments create IP laws to limit these spillovers, or they subsidise or directly fund the investments themselves.

Unfortunately, finding the right balance is difficult, and existing institutions, designed for a tangible-intensive economy in which the stakes are lower, are increasingly challenged. Notably, our existing systems often struggle to encourage high-return intangible investments rather than junk. Everyone is familiar with stories of researchers incentivised to produce papers that nobody ever reads and young people earning degrees that employers do not value. This problem derives from a fundamental property of intangibles: compared with tangible capital, their value is more variable, more heterogeneous. Sorting the wheat from the chaff places an unusually large burden on governments, especially because government systems for funding research or administering patents usually rely on rules, which are not good at making this distinction. Furthermore, our existing systems can potentially deliver publicly supported funding,

but promoting the variety of ideas that are increasingly needed for successful projects can be challenging.

Finance and Monetary Policy. Equally severe challenges exist not only in the financial markets and banking systems that provide finance to private-sector businesses but also in the monetary policy regimes that underpin them. Most external finance for businesses takes the form of debt. But intangible-intensive businesses are not well suited to debt finance. Intangible assets are difficult to pledge as collateral, and the winner-takes-all nature of intangible assets makes assessing creditworthiness more difficult. These realities weaken central banks' ability to manage economic cycles by altering interest rates. The solution is institutional change in how we regulate financial institutions, increasing their ability to invest in intangibles-rich businesses, combined with tax and regulatory rules that favour debt over equity.

It is also time to examine the traditional role of central banks of lowering the cost of credit when an economy needs a boost, which has become much harder with interest rates close to zero—a phenomenon caused in part by rising risk premiums as the economy becomes more intangible. We discuss these issues in chapter 5.

Cities. Traditionally, intangible-intensive businesses clustered in dense, thriving cities, from Silicon Valley to Shenzhen to Soho. Intangibles generate spillovers and exhibit synergies, and the best way to take advantage of these, COVID-19 notwithstanding, seems to be through some face-to-face interaction. But the planning and zoning rules in most rich countries militate against city growth, putting veto power in the hands of homeowners to block it. This veto power gets more and more costly as intangible capital becomes more important. In chapter 6, we examine the evidence for this problem, discuss the political

challenges of fixing it, and suggest solutions that not only allow homeowners and communities to share in the benefits of city growth but also help maximise the benefits of remote working in an intangibles-rich economy.

Competition Policy. It is increasingly argued that the rise of large, dominant businesses—from tech platforms like Google to retail chains like Walmart—is the result of weakened competition policy and that the right response is a return to the more aggressive competition rules of the 1960s and 1970s. As we discuss in chapter 7, we believe this argument is misguided. The growth in the gap between leaders and laggards is mostly a result of the growing importance of intangibles, and it should be addressed not by arbitrary corporate breakups but rather by ensuring that barriers to market entry are low. More insidious and troubling is a different aspect of competition, specifically the growing competition between individuals—also driven by the growing importance of intangibles—that results in greater investment in gratuitous signalling qualifications such as unnecessary graduate degrees and superfluous professional licencing. Discouraging this type of zero-sum competition among individuals is not something that most governments worry about, but it ought to become a political priority.

Two common themes underpin these institutional problems and point to solutions. The first theme is the importance of building capacity in our governments and the organisations that support our institutions, particularly in the functions that relate to intangible investment. In some cases, this is a matter of spending more money on things that have not traditionally been government priorities, such as R&D. But more often it is about investing in the ability to exercise good judgment and to get things done. Functional intellectual property regimes, effective funding of scientific research or education, and deep

and liquid capital markets for intangible-intensive businesses all require specific competencies. These competencies are scarce, especially within government, where they have often been hollowed out in the name of efficiency or austerity. Patent examiners, court administrators, and research funding officers are perhaps among the least glamorous public servants, and their jobs are the first to go when politicians vow to cut bureaucracy and management. But building these particular forms of state and institutional capacity is especially important for building a thriving intangible economy.

The second theme is the idea that if we want to fix institutions, we need to identify and strike political bargains. Our institutions are inadequate not because we don't have enough smart ideas but rather because the status quo suits plenty of people, and change is politically and socially costly. Homeowners do not want more housing built, and they like rules that allow them to block it; IP regimes benefit rights holders, who lobby to extend and strengthen their rights. Improving these institutions requires more than efficient technocracy. It requires deals to make the new institutions work. For example, street-level zoning (discussed in chapter 6) provides homeowners with incentives to support new housing, and increased political capital can help politicians justify increased public spending on elite projects such as scientific research.

These requirements may seem like a tall order, politically. Rebuilding state capacity is a tough electoral sell, and doing the deals necessary to make the new institutions stick requires creativity, cunning, and willingness to challenge vested interests. They necessitate a mind-set of practical optimism, a belief that things can actually get better. But unlike other explanations for the Great Economic Disappointment, the story we are telling and the solutions we are proposing are grounds for optimism.

If the big economic problem that we face were, as some commentators suggest, a general moral decadence or an inexorable, exogenous change in the productivity of new technologies, fixing it would be a great imponderable. But if our problem is that we have failed to update and improve our institutions to keep up with the changing structure of the economy, then there is a solution, even if it is difficult to implement. Institutional renewal has happened before, and it can happen again. If we are successful in its implementation, we can increase growth and prosperity, tackle ecological threats from pandemics to global warming, and find a way out of the unhappy halfway house in which the economy has been stuck for nearly two decades.

INDEX

Note: Page numbers followed by *f* and *t* indicate figures and tables.

accounting, 157
Acemoglu, Daron, 85, 95–96, 266n1
Adler, Gustavo, 60
agglomeration effects, 65, 186
Aghion, Philippe, 276n39
Ahn, JaeBin, 155, 178
Allen, Paul, 204
Andreessen, Marc, 242
antitrust, 212
Arnold, John, 130
Arora, Ashish, 160–61
Arrow, Kenneth, 268n28
authenticity, 6, 35–36, 79–81
automobile, 1–3

Bahaj, Saleem, 174
Bajgar, Matej, 217
bank lending channel, 164
Barnett, Corelli, 107
Basque Country, 204–5
Baudrillard, Jean, 7
Baumol's cost disease, 265n45, 265n49
Belenzon, Sharon, 160–61
Bell, Daniel, 56
Benkard, Lanier, 217
Benmelech, Efraim, 58
Bergeaud, Antonin, 276n39
Berners-Lee, Tim, 146
Bessen, James, 61
Biden, Joe, 212
Blackberry (phone), 131
Blanchard, Olivier, 179–80
block-wide zoning, 197–98
Blundell, Richard, 276n39
"Blurred Lines" (Thicke and Williams), 131–32
Brandeis, Louis, 212
Brav, Alon, 160
Brazier, Alex, 154, 273n56
Brexit, 61, 145, 258
Brief History of Neoliberalism, A (Harvey), 41
broad credit channel, 164
Brynjolfsson, Erik, 39–40, 69, 243
Buffett, Warren, 156
"bullshit jobs," 6, 80
Burgess, Simon, 277n22
business dynamism, 30–31, 69, 226–27
Buyuklieva, Boyana, 193
Byrne, David, 45

Cairncross, Frances, 190
Campbell, Donald, 128
capacity building, 15–16, 143–46, 240, 244, 245*f*, 247, 249–53
Capital in the Twenty-First Century (Piketty), 27, 75
capital stock, 48
Caplan, Bryan, 234

Cardwell's law, 242
Carillion, 80
cars, 1–3
Case, Anne, 29
Castellani, Lorenzo, 257
Cecchetti, Stephen, 151
centralisation, 135–36, 249–55
Cheshire, Paul, 193
China, 111–12
cities, 14–15; COVID-19 and, 185; gap between, and towns, 185; housing capacity and, 196–99; housing costs and, 187–88; infrastructure and, 199–201; institutions and, 196–201; Matthew effect and, 189–90; planning laws and, 193–96; rise of, 184, 186–93, 191*f*, 192*f*; technocrats and, 193–96; transport infrastructure and, 188–89
Cities Unlimited, 194
Clancy, Matt, 187
climate change, 5–6, 34
clustering, 64–65, 75–76
cognitive load, 151, 159, 208, 259
collateral, 151–54, 173–74
collective action, 10, 89–90
collective decision-making, 94–95
collective goods, 96, 244–49, 245*f*, 249*f*
commitment, 10, 114
community wealth building, 205
competition, dysfunctional: conglomeration and, 215–16; declining competition and, 214–16, 214*f*; education and, 231–38; Great Economic Disappointment and, 5, 29–32, 30*f*, 31*f*; institutions and, 227–30; intangibles and, 216–20, 218*f*, 220–27; intangibles crisis and, 70–73, 71*f*, 72*f*, 73*f*; monopolies and, 211–12; reducing, 211–39, 214*f*, 218*f*; workers and, 231–39
competition policy, 15
concentration, competition and, 214
conglomeration, 215–16
contestedness, 65–67
contractual enforcement, 65–67, 95–96
Cook, Tim, 208
Corrado, Carol, 45, 72, 219
cost of capital channel, 164
COVID-19 pandemic, 5–6, 14, 21–22, 24, 31, 34, 57–58, 65, 76–77, 88–89, 129, 140, 180–81, 185, 190–92, 251
Cowen, Tyler, 30–31, 37, 69, 138, 252
Cowperthwait, James, 252
creative destruction, 215
Criscuolo, Chiara, 215, 217
Cummings, Dominic, 145, 258

Daly, Kevin, 169
Davies, Dan, 151, 174
"death of distance," 190, 195, 206–10
"deaths of despair," 29
Deaton, Angus, 29
debt: collateral and, 151–54; finance, 150–55; institutional, 12–17; IP-backed, 171; technical, 12
Decadent Society, The (Douthat), 79
decision-making, collective, 94–95
delegation, 247–48
Dell, Melissa, 85
Dell'Ariccia, Giovanni, 152, 174, 179–80
De Loecker, Jan, 215
Deming, David, 210
Democracy Collaborative, 205
Demsetz, Harold, 87, 93–94
Dickens, Charles, 148
Diewert, Erwin, 270n6
disappointment, economic. *See* Great Economic Disappointment
diversification, 155–58
Douthat, Ross, 79, 243
Drucker, Peter, 55
Duranton, Gilles, 186
Duval, Romain, 60, 155, 178
dysfunctional competition. *See* competition, dysfunctional

Eberly, Janice, 58
economic disappointment. *See* Great Economic Disappointment
economy: contestedness and, 65–67; intangible, 10–13, 52–54, 64–67, 112–16, 115*t*, 165–66, 204–6, 248–49, 249*f*, 265n49; knowledge, 54–56; postindustrial, 56–59
Edgerton, David, 107

Edison, Thomas, 2–3
Edmans, Alex, 160–62
education, 15, 37–40, 43–45, 44*t*, 70, 127, 137–38, 231–38, 277n22
Eeckhout, Jan, 215
Effects of Good Governance on Siena and Its Territory, The (Lorenzetti), 3, 82, 83*f*
efficiency wage, 74
Eghbal, Nadia, 139
electricity generation, 77–78
Ellickson, Robert, 198–99
End of Accounting, The (Lev and Gu), 157
energy production, 77–78
Engelbart, Douglas, 190
Entrepreneurial State, The (Mazzucato), 123, 136–37
equity finance, 155–58
esteem, inequality of, 5
exchange: collective action in, 89–90, 94–95; commitment to, 90; conditions of, 88–91, 98*t*; haggling in, 90–91; institutions as supporting, 91–99, 98*t*; partners, 88–89; property rights and, 93–94, 97–98; as unit of analysis, 266n8
externalities, 93, 178, 188

fakeness, 6, 35–36, 79
Fama, Eugene, 156
finance, debt, 150–55
finance policy, 14
financial crisis of 2008, 60–62, 155
Fingleton, John, 228–29
Finkelstein, Daniel, 156
Fischel, William, 187–88
Ford, Henry, 2
Foulis, Angus, 174
fragility, 5, 32–35, 33*f*, 76–79
Friedman, Milton, 159
Friedman Doctrine, 159
Fukuyama, Francis, 259
Fully Grown (Vollrath), 38–39, 44–45, 69
Furman, Jason, 33, 163

Garicano, Luis, 75
Gates, Bill, 204
Gaye, Marvin, 132
General Data Protection Regulation, 276n18
gentrification, 188
Glaeser, Edward, 185–86, 200
Glorious Revolution, 96–97
Goldacre, Ben, 129, 139
Goldin, Claudia, 126
Goldstone, Jack, 241, 243
Goodhart, Charles, 128
goods, collective, 96, 244–49, 245*f*, 249*f*
Gordon, Robert, 37–38, 42, 69, 243
"Got to Give It Up" (Gaye), 132
Graeber, David, 6–7, 79
Graham, Benjamin, 156
Great Divide, 40–42
Great Economic Disappointment: circumstance explanations for, 8; conduct explanations for, 8; dysfunctional competition and, 5, 29–32, 30*f*, 31*f*; explaining, 8–10; fragility and, 5, 32–35, 33*f*; inauthenticity and, 6, 35–36; inequality and, 4–5, 26–29, 27*f*, 264n31; stagnation and, 4, 23–26, 24*f*, 26*f*; stories of, 36–42, 38*f*; symptoms of, 4–8, 23–36, 24*f*, 26*f*, 27*f*
Great Recession, 60–62
Great Reversal, The (Philippon), 30–31, 41
Greece, 61
greenbelts, 193
Green New Deal, 141, 257
Greif, Avner, 106–7, 258
gridlock, 132
Griffith, Rachel, 276n39
Grow the Pie (Edmans), 160
Grubb, Michael, 225
Gu, Feng, 157
Gutiérrez, Germán, 218
Guyot, Katherine, 208

haggling, 90–91
Haldane Principle, 142
Hall, Bronwyn, 133
Hall, Robert, 270n6
Hannak, Aniko, 224
Harari, Yuval Noah, 36
Hart, Oliver, 91
Harvey, David, 41
Haskel, Jonathan, 45, 174

Hayek, Friedrich, 94, 124
Heller, Michael, 132
Helmers, Christian, 133
"hipster antitrust," 212
Hollywood, 2–3
homes, as collateral, 173–74
Homevoter Hypothesis, The (Fischel), 187–88
housing capacity, 196–99
housing costs, 187–88, 274n10
Howes, Anton, 258–59, 267n20
How Innovation Works (Ridley), 136
Hsieh, Chang-Tai, 217
Hubbard, Thomas, 75
human capital signalling, 233–34
Hutton, Will, 41

improving mind-set, 258
inappropriate institutions, 10
inauthenticity, 6, 35–36, 79–81
income inequality, 27–28, 40–41, 74–75
inequality, 4–5, 26–29, 27*f*, 40–41, 73–76, 264n31, 266n9
inertia, 106–7
inflation, 166–67
influence activities, 10–11, 95, 115, 118, 125, 142, 147, 199, 240, 244–46, 245*f*, 254–55
information, 10, 89, 101, 114, 244–49, 245*f*, 249*f*
infrastructure building, 199–201
innovation, 22, 144–45
institutional debt, 12–17
institutions: capacity building and, 15; cities and, 196–201; competition and, 227–30; defined, 84–85; economic exchange and, 86–87; economic growth and, 82–87; failure of, 9; inadequate financial, 174–81; inappropriate, 10; inertia and, 106–7; intangible economy and, 11–12, 112–16, 115*t*; intangible investment and, 61; intangibles crisis and, 54; political bargains and, 16; politics and, 110–12; properties of, 104–12; purpose of, 87–88; "right," 100–104; social interaction and, 86–87; specificity and, 104–6; as supporting exchange, 91–99, 98*t*; technical debt and, 12; technological change and, 99–104; trust and, 92–93; unpredictability and, 108–10
intangible assets, 48, 52–53, 64, 80–81, 113, 125, 264n39
intangible economy, 10–13, 52–54, 64–67, 112–16, 115*t*, 165–66, 204–6, 248–49, 249*f*, 265n49
intangibles crisis: defined, 63; institutions and, 54
intellectual property (IP)-backed debt, 171
intellectual property rights (IPRs), 13–14, 109–10, 122, 130–36, 134*f*, 226
interconnectedness, 32–33
interest rates, 33–34, 33*f*, 163–71, 168*f*, 170*f*, 272n31, 274n58, 274n63
Invisible Hand, The (van Bavel), 111, 242
iPhone, 123–24, 133
IPRs. *See* intellectual property rights (IPRs)

Jefferson, Thomas, 184–85
Jennings, Will, 29
Jensen, Thais, 273n47
Jiang, Wei, 160
job conditions, 31–32
Johnson, Boris, 257–58
Johnson, Noel, 250
Johnson, Simon, 85
Johnstone, Bob, 145
Jona-Lasinio, Cecilia, 45
Jorgenson, Dale, 270n6
Juicero, 79

Kadyrzhanova, Dalida, 152
Kariko, Katalin, 22
Katz, Lawrence, 126
Kay, John, 36, 162
Kerr, William, 204
Keynes, John Maynard, 25, 148
Khan, Lina, 212
Khan, Zorina, 133
King, Mervyn, 36, 162
Kirzner, Israel, 124
Kleiner, Morris, 135
Kling, Arnold, 10, 85–86

knowledge economy, 54–56
Kortum, Sam, 176
Koyama, Mark, 250
Kremer, Michael, 265n1
Krieger, Joshua, 58
Krugman, Paul, 25, 189
Kuhn, Peter, 32

Lachmann, Ludwig, 124, 269n6
Lakonishok, Josef, 156
Leacock, Eleanor, 91
Leamer, Ed, 36
left-behind places, 28, 40, 76, 185, 195, 201–6
legitimacy, 143–44
Lerner, Josh, 172, 176
Leth-Petersen, Soren, 273n47
Lev, Baruch, 157
Levitt, Theresa, 268n24
Lian, Chen, 152
libertarianism, 250, 252
lighthouses, 100–104, 268nn24–26, 268nn30–31
Lindberg, Erik, 268n24, 268n29
Lindbergh, Charles, 140
Lorenzetti, Ambrogio, 3, 82, 83*f*
Lost Golden Age, 37–40

Ma, Song, 160
Ma, Yueran, 152
Machin, Stephen, 232
Machlup, Fritz, 54–55
Manthorpe, Rowland, 257
market segmentation, 223
Markovits, Daniel, 32, 72–73, 231, 233
markup, 214–15
markups hypothesis, 46–47, 46*f*, 217–18
Marshall, Alfred, 64–65
Mass Flourishing (Phelps), 136
Matthew effect, 158, 189–90
Mauro, Paolo, 179–80
May, Theresa, 257
Mayer, Marissa, 208
Mazzucato, Mariana, 123, 136–37
McAfee, Andrew, 39–40, 59
McNally, Sandra, 232
McRae, Hamish, 28
mean reversion, 156
Meritocracy Trap, The (Markovits), 32, 72–73
Metcalfe, Robert, 277n22
metric tide, 128
Milgrom, Paul, 142, 245
Minoiu, Camelia, 152
mismeasurement hypothesis, 40
Mittelstand, 57
Mokyr, Joel, 43, 242, 258
Mondragon Corporation, 204–5
monetary policy, 14, 162–74, 168*f*, 170*f*
monopolies, 211–12
Moore, John, 91
More from Less (McAfee), 59
Moretti, Enrico, 28–29, 186, 190
Motion Picture Patents Company, 2–3
movies, 2–3
Myers, John, 197

Nanda, Ramana, 172, 273n47
Narrow Corridor, The (Acemoglu and Robinson), 96
Nelson, Richard, 108
Nelson, Robert, 199
New Geography of Jobs, The (Moretti), 190
New Institutional Economics, 84
New Public Management, 252, 254
NIMBYism, 194–95, 200
Norquist, Grover, 252
North, Douglass, 10, 88, 92, 250

Occupy Wall Street, 148
Olson, Mançur, 110–11, 267n15
Open Data movement, 139
OpenSAFELY, 129
Organization Man, The (Whyte), 32
Orteig Prize, 140
Osborne, Matthew, 225
Ostrom, Elinor, 85, 106

pandemic. *See* COVID-19 pandemic
Papanikolaou, Dimitris, 58
patent wars, 2–3, 109, 269n43
Peltzman, Sam, 219
personalised pricing, 223–24
Phelps, Edmund, 136
Philippon, Thomas, 30, 41, 242

Phillips curve, 166–67
Piketty, Thomas, 27, 75, 242
Pinter, Gabor, 174
Piton, Sophie, 218
platforms, 114
Plath, Robert, 123
policy: competition, 15; financial and monetary, 14, 162–74, 168*f*, 170*f*
political bargains, 16
politics, institutions and, 110–12
Posner, Eric, 98
postindustrial economy, 56–59
postmodernism, 7
Preston model, 205
prices, 220–27
priming, 129–30
productivity, 17, 24, 30*f*, 37, 39–43, 45, 67–70, 68*f*, 187, 264n31, 265n3
property rights, 93–94, 97–98, 267n13, 268n22
Proud, Steven, 277n22
public funding, 13–14, 140–43, 275n27
public investment, 127–28, 136–37, 145–46, 203
Puga, Diego, 186
Putnam, Robert, 259

quantitative easing (QE), 178, 274n58

Race between Education and Technology, The (Goldin and Katz), 126
Ratnovski, Lev, 152
reciprocity, 92–93
regulation, sectoral, 228–30
remote work. *See* work from home (WFH)
rent seeking, 117, 138, 141, 216, 244, 254–55
replication crisis, 129–30
reputation, 92–93
research and development (R&D), 48, 53, 55–58, 124–26, 160, 178, 193, 203
retooling hypothesis, 40, 45
reversion to the mean, 156
Ridley, Matt, 123, 136
Roads and Bridges (Eghbal), 139
Robert-Nicoud, Frédéric, 204
Roberts, John, 142, 245
Robinson, James, 85, 96, 266n1
Rock, Daniel, 243
Rogers, Mark, 133
Romer, Paul, 247
Rossi-Hansberg, Esteban, 217
Ruiz-Valenzuela, Jenifer, 232
"Ryan's World" (YouTube program), 35–36

Sawhill, Isabel, 208
scalability, 52–53, 115
Schoenholtz, Jim, 151
Schulz, Nick, 10, 86
Schumacher, Ernst, 58
Schwartz, Peter, 25
Scott, James C., 58
Second Machine Age, The (Brynjolfsson and McAfee), 39
segmentation, market, 223
Selden, George, 2
Sena, Vania, 133
Sever, Can, 155, 178
Shadbolt, Nigel, 146
shareholder value management, 158–62
Sheer, Lia, 160–61
Shiller, Robert, 36–37
Shleifer, Andrei, 156
Shockley, William, 204
short-termism, 159, 161–62
Sichel, Dan, 42, 45
signalling, human capital, 233–34
Simon, Hermann, 57
Skelton, David, 202
skeuomorphs, 106–7
Smith, James, 179
Smith, Noah, 236
Southwood, Ben, 138
special interests, capture by, 130
specificity, 104–6
spillovers, 52–53, 113, 121–36, 134*f*, 158–62, 269n48
Srivastava, Anup, 157
stagnation, 4, 23–26, 24*f*, 26*f*, 67–70, 68*f*
state capacity, 16, 143–46, 240, 244, 245*f*, 247, 249–53
State We're In, The (Hutton), 41
status, inequality of, 28
Stoker, Gerry, 29
street votes, 197–98

suitcase, wheelie, 123–24
Summers, Lawrence, 33, 163
sunkenness, 114, 115*t*, 116, 181
synergies, 53–54, 68–69, 114, 158–62, 269n48
Syverson, Chad, 243

Tabarrok, Alex, 133
Tabarrok curve, 133–34, 134*f*
Taylor, Mark Zachary, 144, 256
Taylor, Tim, 268n24
tech-governance fit, 105
technical debt, 12
technocrats, 193–96
technological approach, 87
technological change, 99–104
technology, 39, 42–43, 68–69, 128–30
technopopulism, 257
Theranos, 80
Thicke, Robert, 131–32
Thiel, Peter, 35, 137, 141, 258
Timmis, Jonathan, 217
Tobin's Q, 25–26, 26*f*, 264n13
total factor productivity (TFP), 43, 45, 67–68, 68*f*, 69–70, 264n31, 265n3
transactions costs, 95, 266n8
transport infrastructure, 188–89, 199–200
Tranter, Justin, 132, 270n19
Trump, Donald, 7, 202, 258
trust, 92–93, 99

uncertainty, 88, 265n49
unemployment/inflation trade-off, 166
unpredictability, 108–10

vaccines, 22, 43
value-based management, 158–62
value investing, 155–58
van Bavel, Bas, 111, 242
van Zandt, David, 101, 268n24, 268n31
VC. *See* venture capital (VC)
Veblen, Thorstein, 107
venture capital (VC), 153–54, 171–75
Vestager, Margrethe, 213
Vishny, Robert, 156
Vollrath, Dietrich, 38–39, 44–45, 69, 243, 264n31
von Mises, Ludwig, 124

Weingast, Barry, 96, 250, 267n19
We Were Burning (Johnstone), 145
Weyl, E. Glen, 98
WFH. *See* work from home (WFH)
wheelie suitcase, 123–24
Whitehead, Alfred North, 149
Whyte, William, 32
Williams, Pharrell, 131–32
work from home (WFH), 60, 185, 190–93, 191*f*, 192*f*, 195, 207–10
working conditions, 31–32
World in 2020, The (McRae), 28

Yudkowsky, Eliezer, 259
Yurukoglu, Ali, 217

Zang, Anthony Lee, 217
Zimbabwe, 96