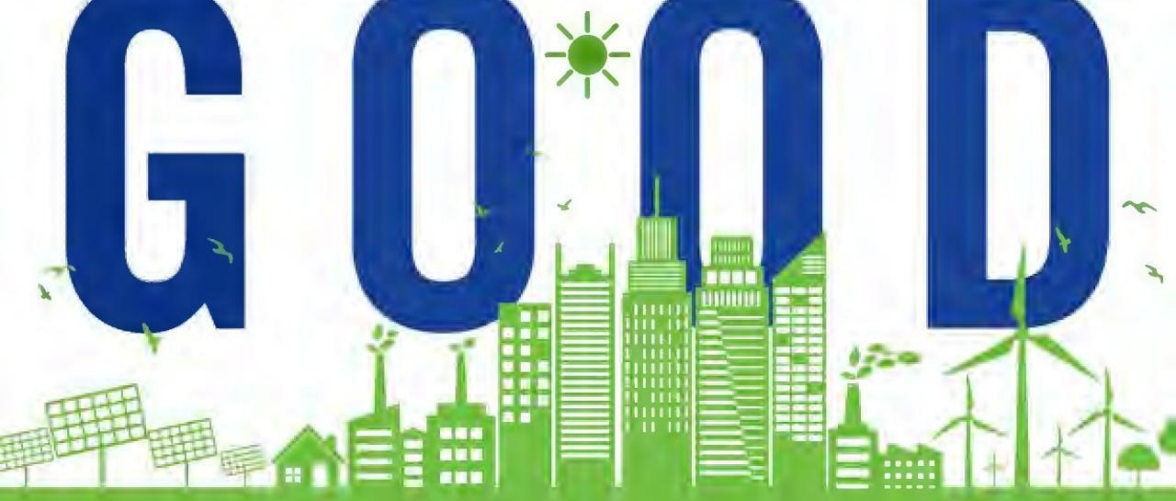
GROWTH *for* GOOD



RESHAPING CAPITALISM *to* SAVE HUMANITY *from* CLIMATE CATASTROPHE

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Preface

Like many good stories, this one starts around a dinner table, specifically on a Roman terrace. The date was 2007. I was just turning twenty and had recently started an undergraduate program in economics in Milan. The hosts were a couple of old family friends—both consummate intellectuals from a left-leaning tradition—and I had been given the chance to tag along with my parents. Respecting the standard Italian dinner script with clockwork precision, between the first and the second course the conversation veered toward politics, the dire state of the economy, and what the government needed to do to get the country out of its impasse.

By the time of the digestif, I had pulled out my basic economics toolkit and was parroting the conventional policy recommendations I had heard so many times in university classes. "Italy needs to implement structural reforms that will boost economic growth" was my main contribution to the debate. At this point, and to my shock, Giorgio—the host—turned my world upside-down by proclaiming, "We need to *stop* growing! As my friend Serge always says, we need to *de*grow!" At the time, I had no idea who Serge was. Only years later would I discover that Giorgio's reference was to the French intellectual Serge Latouche, one of the masterminds behind the *decroissance,* or degrowth, movement. On that note, moved by some paternal protective spirit, my father declared the end of the discussion with the Italian code word *eh vabbé,* and we left shortly thereafter.

Nonetheless, Giorgio's words echoed in my mind for years, laying the seed of doubt and therefore of inquiry into what I otherwise saw as a given, both in my economics classroom and in the public debate. Do we actually need economic growth? And, to begin with, what *is* growth? Since then, I have devoted most of my academic and professional career to exploring these questions, and issues related to economic growth more broadly, in both theory and practice. In many ways, this book is the culmination of

these reflections, and the manual I wish I could have read early on in my economics undergraduate course.

In the 1980s, economist Robert Lucas was prodded by the extreme differences in countries' growth rates to pursue a general theory for economic development. He wondered: Could government actions in a slow-growth nation allow it to match the growth rates of a fast-growing one? If not, what in the first country's "nature" prevented that? "The consequences for human welfare involved in questions like these are simply staggering," he mused in a 1985 Marshall Lecture at Cambridge University. "Once one starts to think about them, it is hard to think about anything else." My own passion for understanding the nature, drivers, and consequences of economic growth has even deeper roots. Coming from a family of scientists, I strongly recognize that to contribute to improving society is to stand on the shoulders of past discoverers and benefit from past accumulation of knowledge.

As it turns out, decrypting the secrets of the accumulation of wealth allows us to understand much else about the world. Questions about growth are deeply interwoven with some of the most important perennial puzzles across social sciences. They link to the theories of value that kept so many classical economists busy from the eighteenth century onward, including Adam Smith, David Ricardo, and Karl Marx. Digging even deeper into history, they link to the interplay between the quest for happiness and the accumulation of material possessions, power, and profit that philosophers have reflected on at least since 380 BCE, when Plato's *Gorgias* narrated a dispute on the topic between Socrates and Callicles. Social tensions within countries, and therefore large parts of national politics, are ultimately clashes over distributions of proceeds of economic growth and the power imbalances that these generate.

Likewise, the resources made available by economic growth, accumulated over time, can help explain the power relations between countries. The turn to industrialization and the rise of the West, considered by some to be the most consequential developments of the last five hundred years, are a story of unprecedented acceleration in economic growth that changed the course of global history. The recent rise of China can be read along similar lines. Geopolitical power and economic growth go together. Naturally, there is another side to the same coin—meaning the continued poverty of many nations and mass migration—which also demands explanations of why economic growth and material progress have not taken off to a similar extent elsewhere in the world. Finally, thinking about economic growth

does not matter only to understanding the past or the present. As we will see, growth is tightly linked to scientific and technological progress, what humans are and will be capable of doing—in other words, it matters to humanity's future.

In light of all this, it will be evident that the ideas, paradoxes, and principles contained in this book have been brewing in my mind for now over a decade. At the same time, 2020 marked a turning point. The year before, upon rejoining EU institutions after my PhD, I had started working on economic questions related to the European Green Deal—the flagship project of the freshly minted Von der Leyen Commission to make Europe the first climate-neutral continent in the world. It was, however, the Covid-19 pandemic that prodded me toward further work related to economic growth—namely, to investigate its relationship to changes in climate, the environment, and nature more broadly. As economies were brought to a grinding halt by lockdown measures aimed at containing the virus, the general feeling was that nature started to heal after decades of abuse at the hands of an industrial society. In 2020, global CO_2 emissions dropped at the fastest clip since World War II, suggesting to many that actively shrinking an economy could perhaps be part of the strategy to combat climate change. This hope was encouraged as images circulated on social media of animals flourishing with the retreat of human activity. The inauthenticity of some of these notwithstanding (dolphins were not swimming in Venice's canals), seeing them led me to wonder: Is it the economy *per se* that is at odds with our planet's well-being, or is it simply the *current type* of economy? More formally, Covid-19 pushed me to deeper exploration of "green growth." This is the widely accepted idea that economic growth need not cause climate and environmental change—the two realms can be decoupled, and rapidly.

As I engaged with the challenge of understanding how capitalism, economic growth, and climate change relate to each other, I felt it was not only my own ideas that needed to be pieced together. Everyone in the hard and social sciences seemed to be working on climate change, using the tools of their various disciplines, but doing so in silos and engaging only superficially with findings from other fields. Throughout history, the growth and increasing complexity of economic activity have gone hand in hand with greater specialization, and the work of producing knowledge has not proved immune to this tendency. To be sure, specialization brings clear advantages in terms of depth and rigor, but if there is one problem that calls for broad interdisciplinarity because it affects practically all aspects of human life, it

is climate change. Avoiding climate catastrophe demands an all-hands-on-deck approach, with all disciplines, all sectors, all agents in society contributing to better understanding and response. For me, locked down in my Brussels apartment, watching the world's experience of Covid-19 was a starkly clarifying lesson in why, when a problem threatens humanity so broadly, effective solutions must draw on many realms of expertise. This is the spirit in which I weave together various strands of knowledge in the pages to come. My hope is that readers will not balk at what might feel like excessive discipline hopping, but will recognize the good-faith effort to give them as rich and complete a picture as possible.

Climate change is too important an issue to allow ideology to blind us to truth. I have worked hard to free myself from preconceptions, taking as much as possible an open-minded approach, even to theories normally belittled by mainstream economics. This book carefully considers the points raised by those who criticize capitalism, its relation to nature, and therefore the mainstream strategy—green growth—being pursued to deal with climate change. Many of these critiques of capitalism have already permeated the collective imagination, whether consciously or surreptitiously, and in combination with the growing sense of urgency to act against climate catastrophe have created fertile ground for systemic changes that, in my view, would take us to places where nobody wants to go.

Finding the societal and economic model that allows humanity to avoid climate catastrophe is just too important a quest to leave to the pages of technical manuals and debates among experts. I have tried here to explore the issues in a way that is accessible to anyone with a keen interest in the subject, whether or not they have any prior knowledge of economics. Technical and ancillary ruminations are consigned to the endnotes, for the keenest (and bravest) of readers.

Will this prove to have been a useful endeavor? By enriching the debate can this book contribute to prompt climate action? Will the 2020s be remembered as the decade when a visible reconciliation began between economic and natural processes—when faith in progress was rekindled? Most importantly, will it turn out that the policy recipe I outline is sufficient to head off catastrophic climate change, while also avoiding an equally destructive global scramble over limited resources? I can only quote Italian poet Alessandro Manzoni, who wrote upon Napoleon's death two hundred years ago, "Ai posteri l'ardua sentenza": only posterity will judge.

GROWTH FOR GOOD

INTRODUCTION

The Origins of Discontent

Few of us can stand prosperity. Another man's, I mean.
—MARK TWAIN

The economic system now dominant in the world—falling under the catchall term of *capitalism*—is failing us. Or, at least, that is the perception in many quarters, to varying degrees. The geography of discontent paints a paradoxical picture: it is the West that, having served as the cradle of capitalism, has now grown most disenchanted with the system behind its unmatched prosperity. Meanwhile, Asia, and in particular China, has shifted to staunch support of capitalism (or at least state capitalism), after decades of ideological battles against it.[1]

The grievances against capitalism today make for a long list, but generally align with two broad indictments. First, capitalism seems to work for the few, not the many, and therefore to accelerate the concentration of wealth and power. Second, as a system powered by fossil fuels, it has put humanity on a path that, if left unaltered, will lead to climate disaster within a matter of years. Caught up in these condemnations is economic growth: If its benefits are not spreading broadly through society, and it is harming the planet, who needs it? Would ending the pursuit of it alleviate materialistic tensions within and between countries, and take much of the pressure off nature?

To answer these questions, we will take a multidisciplinary approach to understanding the nature of economic growth and the origins of the imperative to keep growing. To identify where problems truly lie, we will put a finer point on the vague, ill-defined concept of capitalism to explore the

mechanics of a system in which production is organized for profit using voluntary labor and mostly privately owned capital, and market prices serve to align supply with demand. Informed by a variety of fields, including economics, history, sociology, anthropology, social psychology, cognitive sciences, and evolutionary biology, we will develop a better understanding of why economic growth has been taken up as a "religion of the modern world."[2] It will also become apparent that now is not the first time that this fundamental tenet of the modern economy has been questioned. Detractors of growth have historical and philosophical roots in the work of such towering intellectuals as Thomas Malthus, Jean-Jacques Rousseau, John Stuart Mill, and even John Maynard Keynes. We will see how growth is linked to the concepts of progress, well-being, liberal democracy, science and innovation, consumerism, and capitalism, and how the latter can actually become a precious ally in the effort to rapidly green our economies. In brief, we will see how growth can once more be a force for good when the power of capitalism is harnessed to join the fight against impending climate catastrophe.

A particular focus in these pages on rich countries makes sense for two prominent reasons. First, most of the calls to shelve economic growth originate from thinkers in advanced economies, and it is there that these ideas are spreading most widely. Second, these calls specifically target rich countries, where the environmental footprint per capita is highest. Poorer nations, it is generally recognized, will still need economic growth just to provide for the basic needs of their people. At the same time, this book's analyses of growth hold wider relevance for the world. The inherent mechanics of capitalism, and the interplay with nature, are the same regardless of geography, and obviously the need to address climate change is a global problem. Toward the end of the book especially, as we explore geopolitical interactions between countries and their implications for climate action and growth, the focus will move further beyond rich countries.

In a sentence, the argument I will make is that capitalism can once again become a force for good, but that this will not happen without resolute policy action steadily supported by citizens. The latter phrase is essential to emphasize; this is no Panglossian claim that we can adopt a laissez-faire attitude toward the climate challenge and see a looming catastrophe magically wash away. Both sets of grievances mentioned above, the socioeconomic and the environmental, contain entirely legitimate points

that should compel us to change the direction in which capitalism is currently going.

The list of grievances with capitalism

Let us consider the two broad causes of discontent with the current economic system. First, in his recent magnum opus on the future of capitalism, inequality guru Branko Milanovic documents the sheer extent to which power and wealth have concentrated over the past few decades.[3] *Capitalism, Alone* shows how this trend has played out in the capitalist champion par excellence: the United States. We will inspect some data and trends from America before considering how they can be generalized to the larger set of advanced capitalist economies.

The top 5 percent of US households—those with incomes above $250,000 in 2018—command a growing share of national income, from 16 percent in 1968 to 23 percent in 2018, making the United States, at least among the G7 countries, the income-inequality leader.[4] As one striking part of the trend, we can look at the pay of top executives in corporate America. The Economic Policy Institute calculates that CEO compensation grew by a staggering 940 percent from 1978 to 2018, while the pay of typical workers went up by a meager 12 percent. The ratio of average CEO pay to average worker pay rose from 20:1 in 1965 to 58:1 in 1989 and to 278:1 in 2018.

Daniel Cohen's work to factor in costs of living finds that 90 percent of the US population has gained no actual purchasing power over the past thirty years.[5] As time has gone by, widening income divergences have led to greater concentrations of wealth, a trend dissected by another magnum opus, Thomas Piketty's *Capital in the Twenty-First Century.* In the United States, the top 0.1 percent holds roughly a fifth of recorded household wealth—as much as the bottom 90 percent has. This was not always the case under American capitalism. After World War II, the wealth share of the bottom 90 percent increased for decades; it started declining only in the mid-1980s.

While the degree of income inequality seen today in America and some other English-speaking countries (including the United Kingdom, Canada, Ireland, and Australia) is staggering, even smaller levels of wealth concentration create inequality of opportunity and hence injustice. This is what economist Alan Krueger, former advisor to President Barack Obama,

Graduating into the 2008–2009 Great Recession made it harder to find a job, however, and most importantly left what economists call "wage scars"—the lasting damage that a lower starting salary has on earnings throughout one's career. By some estimates, every percentage-point bump in unemployment costs a cohort of new graduates 7 percent in earnings at the start of their careers, and 2 percent in earnings nearly two decades later.[11] Millennials are living through the lowest-growth generational period in US economic history (Figure I.1). This was true even before the economic shock of the Covid-19 pandemic, and the disadvantage will only be exacerbated by it. No wonder a headline in the *Financial Times* renames them the "Recessionals," and the *Washington Post* calls Millennials "the unluckiest generation in US history."[12]

Lower earnings—combined with costs of higher education that have grown by 70 percent since the turn of the century, far outpacing the overall inflation rate—leave Millennial borrowers with an average of $33,000 in student debt.[13] Another development is that home-buying is harder for this generation. For the first time since the Great Depression, a majority of young adults (under thirty) live with their parents.[14]

Millennials, along with the following "Gen Z" cohort, are also distinguished from earlier generations by their much stronger environmental consciousness.[15] For example, 70 percent of US adults aged eighteen to thirty-four say they worry about global warming, compared to 56 percent of those aged fifty-five or older. Crucially, this trend seems to be cutting across the left-right divide.

Against this background, one might only expect Millennials to be disenchanted with the economic system they live in, which delivers neither sufficient growth and prosperity nor rapid-enough progress on climate change. Unsurprisingly, survey evidence shows that among members of the Millennial and Gen Z cohorts, only half have a favorable opinion of capitalism, compared to 63 percent of Baby Boomers. This growing resentment and appeal for radical alternatives led the *Economist* to dedicate a recent cover story to rising "Millennial socialism."[16] All of a sudden, giving up on "fairy tales of eternal economic growth," as suggested by environmental activist Greta Thunberg in a speech at the United Nations, might not seem so outlandish.[17] In all fairness, we should not be shocked to hear such sentiments, given that mainstream economists have for the most part stopped explaining to wider audiences the purpose of economic growth—perhaps thinking it is obvious to everyone that pursuing post-growth views is economically illiterate and politically infeasible.[18] Yet, at the cur-

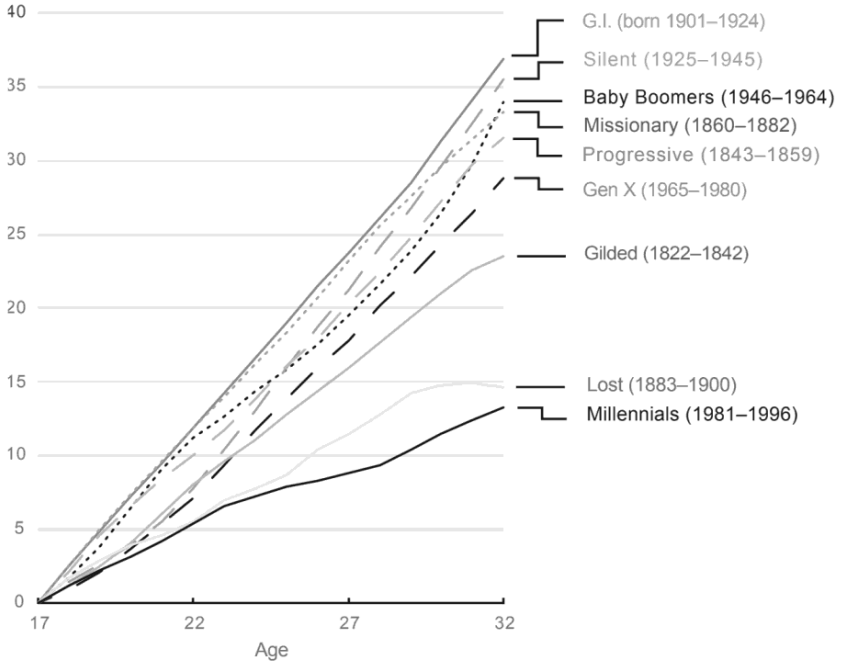

FIGURE 1.1: GDP growth experienced by generations after entering the workforce

Data sources: Maddison Project (Bolt and Van Zanden 2020); IMF WEO (2020).
Notes: Chart shows cumulative real GDP per capita growth during each generation's first fifteen years in the workforce, starting at eighteen years of age, averaged across birth years. Data adjusted for inflation and population. Averages for Millennials are based on fewer years due to data availability. Estimates of GDP per capita in 2019 and 2020 are from the International Monetary Fund's October 2020 World Economic Outlook survey.

rent juncture, the quest for solutions to climate change can leave no stone unturned, and economic growth can therefore be legitimately challenged. Chapter 1 will consider critiques of growth advanced by a variety of scholars on the grounds of both its disputed usefulness to human well-being and the hazards it poses to nature.

If I emphasize Millennials it is not because they are my generation and I feel some special attachment, but rather because, as of 2019, they are the largest adult generation in the United States. Between their voting choices and the fact that, in coming years, they will increasingly move into leadership positions, their perceptions and value system will shape political debates and policies for decades to come.

Most of the facts mentioned up to now come from America. Their implications, however, although with some nuances, are relevant to the wider set of rich, capitalist countries. While university tuition, for example, is generally lower in Europe than in the United States, it is still true that European Millennials share with their American counterparts a debt-to-asset ratio greater than past generations. In Europe, Millennials have lived their working lives while the continent was going through a state of quasi-permacrisis, lurching from the Great Recession to the eurozone crisis to the Covid-19 pandemic—all within a decade or so. A 2018 study by the International Monetary Fund shows the younger generations bearing the brunt of the economic crisis in Europe.[19] Especially for those in Italy, Spain, Greece, and other Southern European countries, the result has been a mix of precarious, underpaid, and undesired-part-time employment, long-term unemployment, and inactivity. The only way to avoid this malaise is emigration in search of jobs.

Among Millennials on both sides of the Atlantic, the feeling is that the social contract—with its implicit promise of ever-increasing socioeconomic improvement over previous generations—has been broken. The result? Trust in the political elite has waned, as has satisfaction with the economy, and younger generations in many nations are looking for radical alternatives.[20]

Big, structural change

Beyond radical Millennials, the idea that our economic system is not on the right track has by now become mainstream. In 2019, the *Financial Times,* not the classic anti-capitalist outlet, launched a call for reform ideas, as capitalism was "in need of a reset."[21] Milanovic, too, even as he proclaims the superiority of the "system that rules the world," acknowledges the important limitations of the current setting, pointing especially to concentrations of wealth and power and the damage done by hyper-consumerism.

Mainstream economists have added much in recent years to the literature on how to reform capitalism.[22] Policy options now being considered include what some might regard as radical plans, such as providing universal basic incomes, sharply increasing wealth taxes, breaking up tech giants, taking the fight to tax havens, capping CEO pay, and replacing narrow measures of gross domestic product (GDP) with more broadly defined assessments of well-being. In the United States, we see growing receptivity to major shifts

(which from a European perspective do not seem all that radical) such as free access to healthcare and higher education—and some politicians advocating further for cancellations of student debt and otherwise trumpeting campaign slogans that sound like "big, structural change."[23]

It is beyond the scope of this book to analyze closely the pros and cons of these various measures—over which much ink has been spilled already, and much more will be in coming years. Zooming out and taking the long view, however, we are only seeing in this reform dialectic the standard, positive, corrective forces that have always operated at the intersection of democracy and capitalism and always sustained their combined success.[24] In a compelling recent book, political scientist Francesco Boldizzoni traces the history of two centuries of mistaken predictions of the end of capitalism.[25] Again and again, detractors failed to understand capitalism's incredible adaptability, and the system's ability to change proved key to its durability. Perhaps the most notorious historical example—the one that disproved Karl Marx's forecast of doom—was German Chancellor Otto von Bismarck's innovation in 1889. His establishment of the first old-age security system based on a payroll-financed public pension was an extremely effective political tactic to stifle growing support for socialism. That policy, which then spread to the rest of Europe, is widely seen as the origin of welfare capitalism, and credited with extending the benefits of material progress more tangibly to the working class. We have witnessed the same dynamic repeatedly: when the economic system runs out of control, public pressure grows, democracy channels that discontent into political processes, and eventually there is correction. To state this so simply is not to downplay the painful operational hurdles of a process that has always been and will always be messy. It is far from easy to assemble the required citizen pressure, political leadership, election results, consensus-building capacities, pushback against entrenched vested interests, and so on. Yet, ultimately, change is brought about. In short, as "radical" proposals continue to arise, and in all likelihood some of those listed above are implemented in coming years, we should not be surprised when they not only make the system more equitable but prove to be compatible with capitalism.

Can the same be predicted on the subject of this book's prime concern—the tensions among disenchantments with current capitalism, pushes toward environmental sustainability, and calls to abandon economic growth? Climate change will be in all likelihood the defining challenge for humanity for decades to come, and no one seriously discussing the future

prospects of capitalism can shy away from its interaction with nature. But while anyone drawing up a radical reform agenda might consider it a natural fit, abandoning economic growth does not belong on the wish list of reforms. You may sympathize with minimalism, abhor material accumulation and clutter, or embrace the anti-flying social movement known as Flygskam. You may loathe the omnipresent cars choking the streets, despise the vast islands of plastic floating in the oceans, or love small local shops versus large chain department stores. None of this is cause for suppressing economic growth. Your vision of a better world might clash with the reality of today but it is perfectly compatible with capitalism.

Meanwhile, for reasons explained in Chapter 2, halting growth would mean felling one of the fundamental pillars of our economic system; rather than a reform of capitalism, it would bring about its demise. This alone signals a need for caution. Too many academics, natural scientists, and members of the general public genuinely concerned about climate change and the environment are flirting with post-growth ideas, I suspect, without fully realizing their wide-reaching economic and political implications. To them is devoted the first part of this book.

To be sure, for some, the idea of tearing down the whole economic system we live in might seem perfectly reasonable. As an *Economist* article put it recently, "many voters will feel that the social contract has been so badly breached that they would rather rip it up altogether."[26] Environmental activists might view capitalism as so inevitably intertwined with resource extraction and climate change that only its demise could preserve the planet. To them is devoted the second part of this book, in which tearing down the current economic system is shown to be neither inevitable nor desirable.

What a post-capitalistic world might look like is anybody's guess. While some believe that it would usher in a utopian society in which people live in peaceful harmony with each other and with nature, there are significant reasons to predict a much grimmer outcome—and to doubt that people will spontaneously embrace a "less is more" philosophy en masse. If this reality were to be ignored and a model of simple living imposed top down, it is likely that the organization of society would rapidly produce misery. Sold as a dream of liberation from the iron cage of capitalism and consumerism, the utopian society would paradoxically turn dystopian. In spite of the initial aspiration of its ideologues, it would be exposed to the risk of becoming illiberal, inward-looking, and conflictual, and would stoke worse tensions within and among countries.

I

Economic Growth and Capitalism

1

THE LIMITS OF ECONOMIC GROWTH

Anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist.

—KENNETH BOULDING, 1973

As recent trends such as widening inequality and environmental awareness provoke startling questions about the very desirability of economic growth, it might seem that this fundamental tenet of our economic system is under attack for the first time. To the contrary, recent critiques are just the latest expression of an old school of thought. It saw its last peak in popularity in the 1960s and 1970s, and has been simmering ever since. In that era, blatant cases of pollution and environmental destruction—not least, a decade of nuclear bomb tests at Bikini Atoll following the Second World War—caused environmental activism to gather steam in America. These sentiments were reinforced by the first full picture of Earth, known as *Earthrise*. Taken during the Apollo 8 mission on Christmas Eve of 1968, this image, as Andrew McAfee puts it, "helped us see that the human condition is inseparable from the state of the planet that we live on."[1] On April 22, 1970, the United States celebrated its first Earth Day.

On the academic side, an MIT team was inspired to create a computer simulation of the world, illustrating the interlinkages between global population, affluence, and the environment. The resulting report, *The Limits to Growth,* was issued in 1972 by the Club of Rome, founded only four years earlier by a group of thirty philanthropists, intellectuals, and members of civil society looking for long-term, holistic solutions to humanity's most pressing problems. In it, biophysicist Donella Meadows and her coauthors argued that exponential economic growth could not go on forever and had to be brought to a halt quickly to avoid civilizational collapse. The modern

degrowth movement was born. Soon, the 1973 oil crisis helped capture the public's attention—the report had warned that raw materials would run out, precipitating the collapse of civilization, and to some it now seemed (even though this crisis was due to geopolitical tensions) that there must be something to that prediction.[2] Just over a decade later, on the other side of the Atlantic, French philosopher Serge Latouche eloquently linked degrowth to an anti-capitalist narrative and became perhaps the best-known European voice in favor of *la decroissance*.[3]

Subsequently, the movement declined to the point of being considered a fringe cult at the borders of economics, but its stalwarts continued thinking deeply about policies that could finally achieve growth curtailment, and how to make a success of it. Occasionally rekindling some interest by the public, but ostracized by mainstream economics, the degrowth band remained vibrant by establishing its own discipline—ecological economics—complete with focused academic journals and self-standing conferences. This chapter presents the degrowth adherents' perspective, objectively laying out the key planks of their criticisms of society, of the usefulness of economic growth, and of the current mainstream approach to climate mitigation. It will be the work of later chapters to offer a rebuttal, arguing that continued economic growth is natural and imperative, and that, all things considered, pursuing green growth is the only credible strategy for staving off climate catastrophe.

Degrowth in all but name

Given that degrowth is formally confined to a small set of radical academics and activists, one might wonder why a full chapter should be devoted to the movement's arguments.[4] The first answer is that, while most readers might never have encountered the term *degrowth,* many of the arguments made by the movement are actually pervasive in current popular debates on the rights and wrongs of our economic system, especially in relation to climate change. You might, for example, have heard the slogan "You cannot have infinite growth on a finite planet." Or the view that "GDP is not what matters—we should instead focus on happiness and well-being." The fact that these critiques of the current economic system sound commonsensical is a testament to just how fully they have permeated the collective imagination.

The second reason to take time to understand the arguments of degrowth scholars is that, over the past fifty years, they have been doing the intellectual heavy lifting of taking the complaints lodged more generally against economic systems that pursue growth and assembling these into a coherent vision for a post-growth world. Their work therefore provides a useful starting point for reflecting on the origins and nature of economic growth itself, before going on to ponder its relationship with capitalism and climate change—a relationship that has only recently strayed onto the mainstream economics radar screen. Learning the arguments of the founding fathers and mothers of the movement also allows us to recognize that the ideas of recent degrowth proponents, their claims to novelty notwithstanding, are essentially identical to those past ideas. This may be why the snappy slogans posted on social media and quoted in articles about degrowth and the environment are almost always dug up from long ago (the epigraph of this chapter being a prime example). Unoriginality is not the issue here. Rather, the repetition suggests that the degrowth critique, framed as a matter of economy versus nature, may be one of those "internal contradictions of capitalism" that Marx spoke of—a tension that is ever-present, and indeed, in his view, so unresolvable that it must eventually cause the system to collapse. Again, the important function of this chapter is to explain where degrowth thinkers are coming from; even if by the end of this book you are persuaded, one hopes, against their policy recommendations, the concerns they raise are more often than not entirely legitimate and demand a response. This is especially true now, as our economic system seems to be underserving many people and threatening the very planet. To be credible at all, the strategy this book offers to head off climate catastrophe (or any other strategy for doing so) must address these legitimate concerns.

Another merit of the degrowth school is that it draws on multiple disciplines—from economics and sociology all the way to anthropology, philosophy, ecology, and design—as it imagines an alternative society for the post-growth world.[5] The downside of the movement's sprawl over multiple disciplines is that there are several high priests in the degrowth church, and the common heading often conflates their quite different worldviews. This makes it challenging to discern the fundamental principles of degrowth. Still, to stick to the religious metaphor, *The Limits to Growth* can be seen as the equivalent of the timeless Old Testament in the degrowth community, and as for the New Testament, that would probably be Tim Jackson's best-selling *Prosperity without Growth*. Many other texts exist and

First, despite all the renewable energy sources (including solar, wind, hydro, and geothermal) being brought online, and all the regulatory actions in richer countries to compel greater energy efficiency, encourage shared mobility, and so on, CO_2 emissions have, at best, dropped very little. This paltry change is particularly disappointing when we contrast it with what climate scientists are saying is necessary. To give a rough sense of the sheer scale of the green transition needed, Figure 1.1 includes a linear trend line approaching zero emissions by 2050. Of course, this may overstate the challenge; after all, climate experts do not say that we must achieve zero emissions by 2050 to avoid climate catastrophe but rather "climate neutrality" by then. This allows for the possibility that the account could be balanced by carbon capture and storage technologies or other solutions that effectively take CO_2 out of the atmosphere.[7] Such technologies, however, are only now being tested and have yet to prove successful on a large scale.

This brings us to the second part of the critique—that we cannot bet the future of the planet on technologies that do not yet exist. Given historical trends, technological development and deployment would need to accelerate at an incredible rate to ensure rapid-enough reduction of greenhouse gas emissions, and even faster if economic growth continues unabated. Even the least pessimistic voices in the degrowth movement would say that, while technology can be part of the solution, it will not save humanity from climate change.

Jevons's paradox, or the "rebound effect"

We are all by now familiar with the pattern that, when a new model of car, television, refrigerator, heating system, or other consumer product is released, it generally rates as more energy-efficient than ones of the previous generation. How can it be, then, that even as this process has been going on for decades, and the upper tiers of efficiency scales have stretched into extreme ratings like AAAA+++, aggregate CO_2 emissions have not descended accordingly?

This is a paradox that has historical roots. In 1865, William Stanley Jevons observed that, as technology improved the efficiency of coal use, the surprising outcome was an increase in the consumption of coal in a wide range

of industries. Jevons concluded that, contrary to intuition, technological progress could not be relied upon to reduce fuel consumption.[8] An increase in the efficiency of an appliance reduces the energy needed to perform a specific task, but simultaneously makes it cheaper to use said appliance more extensively. If your new car guzzles less gasoline, then for the same price of a full tank, you can now drive around more. If you replace the light bulbs in your house with more energy-efficient and long-lasting LEDs, you might worry much less about turning off the lights. If you run an airline, and you can fly planes with less fuel, you might promote cheaper weekend-getaway fares to get customers traveling more. This links to the degrowth argument that, in the words of Tim Jackson, "simplistic assumptions that capitalism's propensity for efficiency will allow us to stabilize the climate or protect against resource scarcity are nothing short of delusional."[9] The extent to which energy-efficiency improvements gave rise to a broad-based rebound effect in CO_2 emissions over the past decades remains a disputed empirical question.[10] At any rate, degrowth proponents use Jevons's paradox to argue that today's prevailing value system, whereby "more is always better," is a recipe for disaster.

Slogan 3: "You can't produce stuff out of thin air"

To appreciate another pillar of the degrowth worldview, consider a thought experiment. Assume for a moment that renewable energy sources could indeed be rolled out at an accelerating pace, to an extent that CO_2 emissions could be brought down to safe levels. This would mean solar panels everywhere, vast wind parks both on land and offshore, complete conversion of all planes, cars, trucks, and buses to electric or hydrogen, and retrofitting of virtually every commercial and noncommercial building. Still, in the words of systems ecologist Charles Hall, "If we were to replace traditional non-renewable energy with renewables, which seems desirable to us in the long run, it would require the use of energy-intensive technology for their construction and maintenance."[11] Moreover, most of these things would need to be produced out of raw materials including steel, cement, rare earths, copper, and so on. Even assuming these could be extracted with minimal carbon emissions, the overall process would exert pressure on the environment.[12] By trying to fix one problem—notably, climate change—

humanity might still fall short on other dimensions of environmental preservation, and exceed one or more of the other planetary boundaries (to use environmental scientists' term) within which society's activities must remain.[13] This brings us to the argument the degrowth school considers a checkmate statement: You can't have infinite growth on a finite planet.

Malthus reloaded

This first set of propositions leads degrowth adherents to the overall conclusion that consumption, production, and ultimately income are inescapably tied to greenhouse gas emissions and environmental degradation. Infinite growth is not possible on a finite planet and therefore its pursuit should be set aside, or else we face an inevitable civilizational collapse. If all this sounds dismal, consider that a similar concern for material limits is what led economics to be dubbed the "dismal science" in the first place. Near the end of the eighteenth century, an English demographer, economist, and cleric named Thomas Robert Malthus observed growing food production and increasing well-being, and predicted that these would have the effect of expanding the human population. His *Essay on the Principle of Population* (1798) postulates that, because population growth is exponential and therefore exceeds the more linear expansion of resources available to feed people, famine and disease must follow. Such large-scale reductions of the population serve to restore equilibrium. The growth predicament he described became known as the "Malthusian trap." Perhaps due to his clerical background, Malthus interpreted the trap as a punishment from God, and an invitation to fight primordial instincts and voluntarily follow more conservative sexual behaviors.

While this dismal pattern had held true to a large extent for centuries, Malthus was unlucky enough to publish his book precisely at the inception of the Industrial Revolution, which unlocked a period of unprecedented prosperity. Global population increased almost sevenfold in just over two hundred years, from roughly one billion in 1800. Thanks to technology, humanity escaped the Malthusian trap, at least temporarily. To degrowth advocates, however, climate change and planetary boundaries are a return of the Malthusian trap, and with a vengeance. While innovation (in the form of industrialization) allowed us to escape it that time around, today's renewable technologies are not proving successful in decoupling economic growth from greenhouse gases. To degrowth advocates, it seems clear that

we face a stark choice: we can either curtail economic growth voluntarily, or else face Malthusian-style catastrophe.

Illustrating its capacity to connect across disciplines, the degrowth movement combines this first set of environmental critiques with a second major concern—that there is too much "obsession with economic growth." Considerations of the size of our economy take a central role for politicians and policymakers, to the point that elections are won or lost on this battleground. This special attention to the size of the economy and specifically to GDP, the objection goes, is wrongheaded for a variety of reasons.

Slogan 4: "GDP measures everything, except what we really care about"

The expansion of gross domestic product was always supposed to be a means to an end rather than a societal goal in and of itself. As Thomas Jefferson once wrote, "The care of human life and happiness . . . is the first and only object of good government."[14] In the 1930s, the inventor of GDP measurement himself, Nobel laureate Simon Kuznets, recommended not focusing on it too much, as "the welfare of a nation can scarcely be inferred from a measure of national income."[15] In the same spirit, degrowth preachers fear that, as a society, we fail to see the forest as we focus on the trees. We have been deluded by a culture that equates happiness with consumption, trapped in an iron cage of hyper-consumerism. The truth is that, as Tim Jackson puts it, "prosperity . . . transcends material concerns. It resides in the quality of our lives and in the health and happiness of our families. . . . Consuming less, voluntarily, can improve subjective well-being, completely contrary to the conventional model."[16] GDP's detractors point out that it does not even differentiate between types of consumption that normatively should have different weights. Consumption for basic needs—say, access to running water—does not count more than consumption for wants, such as buying a new garden irrigation system for a posh Bel Air villa.[17]

The list of grievances aired against the single most well-known economic metric in our societies extends well past its failure to see different shades of consumption.[18] First, GDP says nothing about inequality: national income might go up but be entirely pocketed by the richest. Second, it does not factor in the damages from our eating into natural resources and polluting the planet. When a forest is chopped down and the wood is sold, GDP

goes up, despite the facts that climate change is aggravated and our children will have less nature around them. Third, GDP does not account for non-remunerated activities carried out at home, such as caring for children or elderly parents—work, by the way, which still falls disproportionately to women. In short, the degrowth argument goes, GDP measures everything except what we actually care about. This is the message Robert Kennedy delivered in 1968 in a speech worth quoting:

> Gross national product does not allow for the health of our children, the quality of their education or the joy of their play. It does not include the beauty of our poetry or the strength of our marriages, the intelligence of our public debate or the integrity of our public officials. It measures neither our wit nor our courage, neither our wisdom nor our learning, neither our compassion nor our devotion to our country, it measures everything in short, except that which makes life worthwhile. And it can tell us everything about America except why we are proud that we are Americans.[19]

Degrowth proponents are therefore unanimous in suggesting we should move beyond GDP as the main target variable of economic policy. To some, this means actively shrinking the size of our economy. Others take a more nuanced view. In her 2017 best seller *Doughnut Economics,* Kate Raworth (a self-styled "renegade economist") proposes that we become agnostic about GDP growth, and instead move on to focus on a variety of indicators of "things we care about," such as social equity, gender equality, housing, food, and health, while ensuring we are operating within planetary boundaries. She presents this array visually in the shape of a doughnut, laying out the "safe and just operating space for humanity." At first sight, this fresh economic thinking sounds perfectly aligned with the various governments and international organizations now looking at ways to enhance the scope of their monitoring of the economy, under a "GDP and beyond" agenda. For instance, since 2018, the government of New Zealand has been assessing the impact of its budget measures against a set of indicators covering social, human, and natural considerations. The OECD and the European Union are exploring scoreboards that could account for various dimensions of well-being.

What might seem like an innocuous linguistic nuance between "beyond GDP" and "GDP and beyond," however, carries extraordinary implications for policymaking and the future of our society. We will return to this topic in pages to come.

three-part argument: It is a myth that humans are selfish, individualistic, and endlessly greedy. Capitalist institutions made us that way. And because institutions are social creations, they can and should be changed.

The natural death of growth

The last arrow in the degrowth quiver is the argument that, whether we like it or not, economic growth is on an inexorable downward path. Its arrival at its natural end is only a matter of time. Across the decades since the Second World War, global GDP per capita grew 3.6 percent in the 1960s, 2.1 percent in the 1970s, and only 1.2 percent in the 1980s. It has remained below 2 percent since then. In advanced economies, growth has remained particularly sluggish since the Great Recession of 2008–2009—a fact that led former US Treasury secretary Larry Summers to speculate in 2013 that we were experiencing "secular stagnation." In *The Rise and Fall of American Growth,* economist Robert Gordon postulates that productivity growth is on a structural downward trend because the inventions with truly life-altering power are all behind us. Between 1870 and 1970, our world was transformed by electric lighting, indoor plumbing, motor vehicles, the telegraph, air travel, and so on. The impact of these simply cannot be matched by subsequent inventions, as revolutionary as computers, the internet, and smart devices may seem to be.

In desperate, last-ditch efforts to revive growth, governments in advanced economies are increasing public debt to levels never observed outside of war periods. This was true even before the Covid-19 crisis. In the eyes of Tim Jackson and Kate Raworth, the deregulation and financialization observed since the 1980s in the United States and United Kingdom are just short-term fixes being applied along with others to prop up the system—and have only made growth more unstable and increased the frequency of financial crises and recessions. Anthropologist David Graeber blames the misleading religion of economic growth—in combination with the ongoing march of labor-replacing automation—for the rise of the "bullshit job," which he defines as "a form of paid employment that is so completely pointless, unnecessary, or pernicious that even the employee cannot justify its existence."[26] In many ways, then, the degrowth argument points out that growth is abandoning us. Rather than prolong our toxic attachment to it, we should reflect on how society could be different in a growthless environment. We

should restructure our institutions to be more resilient. And we should redefine what we mean by prosperity.

Agree with it or not, the degrowth movement has built, through one socioeconomic critique after another, a consistent narrative of the world. It can be summarized as follows. The growth of national incomes is inextricably tied to the rise of greenhouse gas emissions, and will remain so over the foreseeable future. National income is mismeasured and, to the extent the measurement does reflect reality, it reveals that GDP growth does not equate to happiness. And growth, doomed in any case, is already in the throes of its inevitable decline. Therefore, we should ditch economic growth as a target and shift to an economy and mindset of mere sufficiency, taking the path suggested by inspiring (often Eastern) philosophies, alternative cultures, and subsistence communities. At least this is what we in advanced economies should do, while appreciating that poor countries still need to grow further to provide for their peoples—and indeed creating additional space for them to do so. Only with global redistribution of wealth can a credible fight be taken to climate change that will not result in overall decreased happiness—and that should even boost happiness, as humanity is unshackled from superfluous consumption and production.

It is a narrative that, although it sprang from a different crisis perceived over fifty years ago, speaks to a lot of concerns currently on people's minds, especially in the Millennial and Gen Z generations. Perhaps unsurprisingly, in recent years, this worldview has made conspicuous gains in mainstream media attention.[27] Yet even in some unexpected quarters, elements of the degrowth creed are resonating, eliciting support, for example, from eminent energy experts like Vaclav Smil, advisors to the United Nations, directors at accountancy giant KPMG, physics Nobelists, a former US secretary of energy, the president of Ireland, the European Environment Agency, and His Holiness Pope Francis.[28]

Clearly, abandoning economic growth would have broad and deep implications for the way our society is organized and for the capitalist system. What might these include? Here, consensus within the degrowth church breaks down. For some, including early Latouche and recent Hickel, degrowth represents a mortal blow to a system that can only survive on perpetual expansion. For others, such as Meadows, free markets will remain vital, and a degrowth agenda need not entail more than some important

tweaks to the current system.[29] For Tim Jackson, the question is almost irrelevant. Having painted a picture in his book of an ideal post-growth world, he concludes: "Is it still capitalism? Does it really matter? For those for whom it does matter, perhaps we could just paraphrase *Star Trek*'s Spock and agree that 'it's capitalism, Jim. But not as we know it.'"[30]

Yet the impact of abandoning economic growth cannot be so easily waved away. In Chapter 2, we will explore the real-world ramifications of embracing what might come across as a pleasant alternative societal vision and commonsensical policy agenda. As we'll see, the reverberations extend further than many can imagine.

2

GROWTH AND THE MECHANICS OF CAPITALISM

Economic growth has become the secular religion
of advancing industrial societies.
—DANIEL BELL, 1976

What is economic growth? To answer this question might feel like an intuitive, almost trivial task. Humans have known the cumulation of wealth probably since the dawn of time, and at least since the earliest days were chronicled in the Book of the Genesis.[1] It is in the Old Testament, too, that the famous "wealth of nations" gets its first mention.[2] Today, talk of economic growth is constantly around us; in newspapers, television shows, political debates, and presentations by corporate managers and business strategists, inevitably the g-word is invoked. At the same time, it would seem that answering the question must involve real complexity, as a battle for ideas has centered on it since the times of Adam Smith and Karl Marx, and an entire field of study, growth economics, has grown out of it.

Before jumping into that fray, it is worth spending a few words on definitions which will turn out to be useful as we proceed. In its most basic form, the *economy* refers to the set of activities within society aimed at producing goods or services to exchange and to fulfill people's needs and desires. Experiencing *economic growth* therefore means producing more or better goods or services in aggregate than in the past. Whatever it is that you produce, whether goods or services, you will use *inputs*—some combination of labor, capital, land, raw materials, and energy. To clean apartments, custodians use their time (labor), plus vacuum cleaners (capital), detergents (materials), and electricity (energy). Accountants, lawyers, physicians, and ski instructors all draw on inputs, as well.

Achieving any higher level or quality of production requires either increasing the amount of inputs (*extensive growth*) or learning a way to do more with what you have (*intensive growth*). Let's say you are a woodworker, you make kitchen tables for a living, and you want to produce more. You might hire someone to give you a hand (increasing labor input) or you might buy machines to expedite the cutting, gluing, painting, and chiseling (increasing capital input). Alternatively, you might figure out new ways of using your current tools and machines to produce more without adding inputs. You might even find a new way of producing more tables that also reduces your raw material input—perhaps by collecting back old tables from your customers and using new techniques to recycle the wood (making you part of the *circular economy*). Producers across society make such decisions constantly, and the aggregate of their actions is what a country's economic growth is all about.

The measurement of gross domestic product (GDP) has the aim of trying to capture this aggregate—the size of an entire economy—in local currency terms.[3] It has its shortcomings since, at the end of the day, it is simply a statistical artifact that relies on assumptions and is subject to limitations. Nonetheless, it is useful because, while *you* might make kitchen tables, other people produce green tea, software apps, and yoga classes. All use different sets of inputs to produce different outputs. To aggregate all these units and make them comparable we give each a monetary value, which is typically the price paid for it (its *market price*). Aside from allowing the aggregate size of the economy to be gauged, pricing everything with a single metric allows people within the economy to make comparisons, establishing a basis for decisions given that resources must be allocated across otherwise hardly comparable things. Yet many things that surely matter, such as hugs from family members, acts of kindness by neighbors, and time spent with friends, are not factored into GDP. Because they are not transacted, they are not part of the economy, and because they are not on the market, they are not captured by GDP. This explains the common sardonic quip that "economists are people who know the price of everything, and the value of nothing."

Economics is the study of allocation of *scarce resources*.[4] For something to show up on the radar screen of the discipline, it needs to be a resource—that is, somebody must attach some value to it—but crucially it also needs to be in limited supply, meaning not everyone can have as much as they want of it. When property rights are well defined and protected, the very

growth, or the yearning for it, were to be suppressed, the entire system would be destabilized.

In what follows, we will focus on the concept of zero growth, otherwise known as *steady-state* capitalism. This focus makes sense given that even those degrowth advocates calling for the economy to shrink see that as only an intermediate, necessary step on the way to a lower, sustainable level at which to stabilize. For the time being, we will concentrate on the stabilization of growth, leaving the transition dynamics for a later chapter.

Institutional structures

One cannot discuss clamping down on growth in a vacuum. Democratic capitalism is inherently complex machinery, and new layers of complexity have been added year after year. Among the various features and structures of our economic system are some that crucially depend on economic growth. The prime example is the welfare state.[11] Think of unemployment benefit schemes, old-age pensions, and healthcare.[12] All of these institutions are luxury goods that can be paid for and sustained thanks to continued economic growth.[13] Across advanced economies, on average, government spending on health and social protection accounts for almost 20 percent of GDP, a much larger proportion than any other budget line items. Add to this that population growth is flattening, or even shrinking, while life expectancy grows. The effect of these trends is that the welfare state takes up a growing share of societal resources (or GDP), as growth rates for these expenditure lines are higher than those for the whole economy.[14]

A second but related point has to do with public and private debt. Even before the Covid-19 shock, total public and private debt combined was north of 300 percent of GDP for practically all G7 economies: the United States (318 percent), Britain (310 percent), France (351 percent), Canada (356 percent), Italy (301 percent), and Japan (444 percent). Thrifty Germany (215 percent) was a notable exception. These debt levels are generally considered sustainable because of an assumption that these economies will keep expanding. This conviction alone keeps a massive debt sell-off from materializing. By the same token, abandoning growth would likely result in a cascade of household, corporate, and potentially sovereign debt defaults. Defaults would then make it harder for governments to borrow from financial markets, should there be the need to later on. If and when an unex-

pected shock arrived, crisis management and any sort of (Keynesian) fiscal stimulus would have fewer resources to deploy. The Covid-19 pandemic provided a good example: when the crisis hit, governments in rich countries borrowed massively to sustain incomes while their economies went on lockdown. Governments in developing countries, with more limited access to financial markets, could not do so to the same extent and their economies were more exposed to the fallout.

In a steady-state environment, access to financial markets would also be harder because governments would have less to borrow against—that is, less expectation of a larger economy in the future, or else a larger taxable base.[15] The reason that governments can borrow more easily, in general, than private companies is that lenders know that a sovereign state has taxing powers and, should push come to shove, can find a way to repay its debt. Of course, taxation is highly unpopular, so governments prefer to repay their debts with the larger tax revenues that come with economic growth. Or, if a nation cannot grow out of its debts, another alternative is to finance its crisis-management countercyclical spending with subsequent austerity, probably involving more belt-tightening than was seen in Europe after 2009.[16] Still another route is to print money, generating high levels of inflation. Yet these latter options are just as unpopular as higher taxes, and are known to disproportionately harm the poor.[17]

For reasons that will be outlined in Chapter 7, the era of climate change is highly likely to intensify the need for redistribution and welfare spending. We know that curbing emissions—for example, by means of a basic carbon tax—creates a burden that falls disproportionately on the poor. This became evident in 2018 when the Yellow Vest movement launched its protests in France in response to a gasoline tax hike. Furthermore, climate science warns us that shocks from extreme weather conditions, droughts, and flooding will be increasingly frequent in the future. As the rich migrate to less exposed regions, and buy additional private insurance, the poor will be less able to do so. Summing all of this up, having only a steady-state economy in a time of climate change would leave governments with less borrowing power, expose the poor to more harm, and generate higher cyclical volatility for countries and individual citizens alike.[18]

There is more to fear, too, since economic growth tends, heuristically, to be highly intertwined with employment levels, at least in the short term. When growth falters, unemployment goes up (Figure 2.1). Perhaps glorifying this basic empirical regularity too much, economists refer to it as

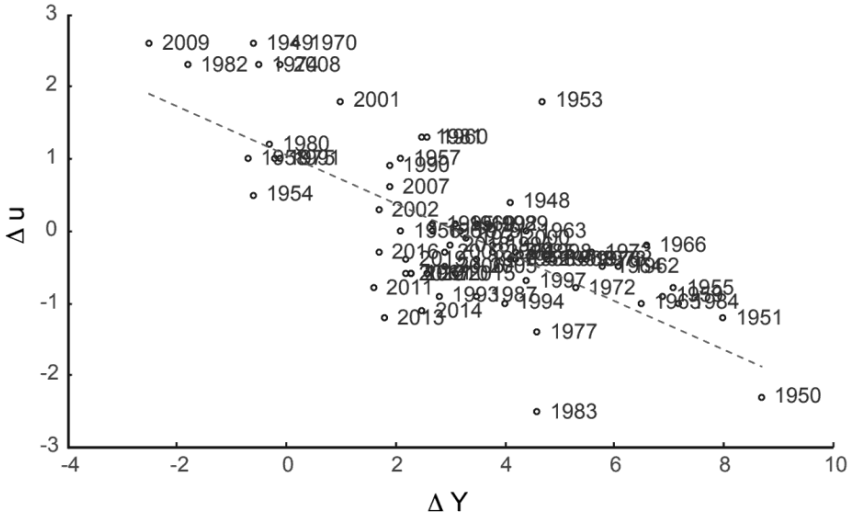

FIGURE 2.1: Okun's law in the United States, 1948–2019

Data source: Ball et al. (2017).

Notes: Horizontal axis shows annual growth rates; vertical axis shows changes in the unemployment rate as tracked by the US Bureau of Economic Analysis and the US Bureau of Labor Statistics.

Okun's Law, after Arthur Okun, who chaired the US Council of Economic Advisers in the Lyndon Johnson administration and documented it in the 1960s. This is why we so often hear the words *growth* and *jobs* used together.[19] Okun's Law implies that a degrowth agenda would increase the need for unemployment benefits and other forms of income support, while also leaving governments less able to meet it. The same would be true for any form of universal basic income, should this be rolled out in the future.

A related point, made in a powerful speech by former Indian central banker Raghuram Rajan, is that new technologies and global competition have had a tendency to destroy jobs made up of repetitive and routine tasks, normally performed by low-education, low-income workers.[20] In this context, economic growth performs a further crucial function: it creates replacement jobs to provide ongoing employment for those for whom substantial new training is simply too onerous.

Going through these arguments, we get a sense of a paradoxical situation. Large parts of the degrowth critique come from a progressive or "Millennial socialist" angle, and are accompanied by calls for tougher stands against

inequalities, more support for the poor, and a stronger role for the welfare state more broadly. We have just seen, however, that an economy without growth would leave governments with *less* financial firepower to fight such challenges, even as it expanded their scale—leaving the much-hated alternatives of austerity or iniquitous inflation to pay for them. It comes as no surprise, then, that degrowth advocates have gravitated to the pipe dream of Modern Monetary Theory as an escape route from this policy conundrum. This theory purports to bust the "deficit myth" (to invoke the title of Stephanie Kelton's book) by promoting money-printing as a sustainable and unlimited way of financing government, magically without creating inflation.[21]

Recall that the welfare system was first created back in the nineteenth century precisely to shore up capitalism against some of its most perverse wealth-concentration dynamics, and therefore to contain the insurgence of social unrest. Wouldn't diminishing the welfare state's firepower at a time of pressing need do the opposite? We can credibly suppose that it would further destabilize the whole economic system and that, as Heather Boushey argues, the increase in inequality would also stifle competition and innovation.[22]

This does not necessarily mean that degrowth must imply the complete end of the welfare state. It is possible that people would not object to more meager pensions or even less medical care. In line with what one political scientist calls "the environmental paradox of the welfare state," if people could be broadly persuaded that "less is more," they could live happily with lower levels of support.[23] According to the degrowth narrative, the fact that life in the post-growth utopia would be less stressful, thanks to a better work-life balance, would in part make up for lost healthcare spending. There might therefore be ways to reinvent a smaller and different type of welfare system that could work in a steady-state economy. Still, it should be evident that abandoning growth would cut through several of the institutional features that characterize our *current* economic system. As such, it would force a rather wide-reaching, structural rethink of our economy, much deeper than is reflected in the current public discourse on the topic.

The price mechanism

So far in this chapter, arguments have been made that our capitalist system in the way it is currently organized is incompatible with degrowth. At a

deeper level, we are about to discover that the quest for growth is a cornerstone of capitalism itself, and abandoning it would not call for just some reorganizing. It would strike a mortal blow to the entire system, requiring a complete societal rethink. To see this, we must descend into the mechanics of capitalism.

In *Capitalism, Alone,* Milanovic builds on Max Weber to craft a compact definition of capitalism. It is "production organized for profit using legally free wage labor and mostly privately-owned capital, with decentralized coordination." Decentralization requires an automatic system that allocates scarce resources through a series of recursive individual decisions. This is the *price mechanism,* and it is the central feature at the heart of capitalism. It is the mechanism by which demand and supply equal each other at all times: changes in prices are the valve that adjusts the process. The price mechanism is in essence Adam Smith's famous "invisible hand." If demand for avocados, for example, rises higher than supply, perhaps as a result of some culinary fad, the price will go up. That higher price will attract more farmers to shift from producing other crops to producing avocados, thus increasing supply, and this in turn will progressively bring the price back down. Note that this works only where there is a degree of competition in the market and also entry possibility. If the entire supply of something comes from a monopolist and cannot be affected by other producers, the one-to-one relationship between quantity demanded and price breaks down. In many cases, the monopolist has an incentive to undersupply a good to keep its price artificially high. This underscores a wider point, that for the price mechanism to operate smoothly a set of rules (or "institutions") must be in place, including a free and open competitive environment, well-defined and protected property rights, and a functioning legal system to support contract enforcement.

When good institutions are in place, the price mechanism can serve three important coordinating functions:

Signaling. Prices draw resources where they are needed, rising and falling to reflect this pattern.

Transmission of preferences. Through changes in prices, consumers send decentralized signals to producers about their changing needs and preferences.

Rationing. If demanded quantity for a good is higher than the available supplied quantity, prices adjust until the two balance out.

There is one way to reconcile zero growth with the price mechanism and capitalism. We have all heard that quintessential capitalist mantra "the customer is always right." If consumers were to radically change their usual preferences and renounce their desire for products of new kinds and in greater quantities and varieties, then supply—meaning profit-maximizing producers—would adjust. This would work if all consumers bought into the "less is more" mantra (the likelihood of which we shall examine later). Nobel laureate Robert Solow's statement that there is "nothing intrinsic in the system that says it cannot exist happily in a stationary state" should be read through this realization that growth, in the end, is merely the result of people's preference for more.[29]

Let's take stock of what we have learned so far. First, the current, capitalist organization of our economic system is not compatible with a steady-state economy, at least given current consumer preferences. Second, beyond the current institutions, and therefore cutting across different varieties of capitalism, whether Anglo-Saxon, Japanese, or Scandinavian, degrowth is incompatible with the price mechanism and therefore with capitalism, *tout court.* This does not prove (yet) that degrowth is a bad idea; it only reveals it to be an idea that undermines the entire way our current economic system is organized. As its advocates push for it, then, they cannot simply tack it on as an extra item in a list of policy suggestions to reduce inequalities or tackle climate change. They must be ready to present a blueprint for a new society.

Innovation as growth

There is, finally, a third level at which we can challenge degrowth and its relation to capitalism. Going to this depth requires a historical understanding of the economic model that allowed nations—first in Europe, starting around the end of the eighteenth century, and later "the rest" outside the West—to expand without precedent.[30] In *A Culture of Growth,* Joel Mokyr masterfully lays out the origins of our modern economy. A consummate economic historian, Mokyr shows that, contrary to conventional wisdom, what happened around the Industrial Revolution is not so much that a specific invention came on line, be it iron manufacturing, steam power, or improvement in transport. Rather, there was a paradigm shift

from what Mokyr calls "Smithian growth," which had characterized proto-capitalism as described by Adam Smith, to what followed from then on: sustained, innovation-led "Schumpeterian growth."[31]

Before the Industrial Revolution, growth was mostly driven by commerce, more effective markets improving the allocation of resources, and the division of labor, as described by Smith in his famous observation of how work was organized in a pin factory.[32] This "Smithian model" generated some growth and, occasionally, when significant inventions came along, such as heavy plows, mechanical clocks, spectacles, and windmills, the economy experienced a temporary boost. But while a given innovation might cause something of a revolution in a specific sector, its impact on aggregate growth would eventually peter out. What happened, first in England and then progressively in the rest of Europe, was that this model of sporadic innovation switched to one of sustained and cumulative innovation. Mokyr argues that this transition was the result of a cultural transformation with origins in the sixteenth century, when some meta-innovations took hold. These included the scientific method.[33]

Dubbed "the knowledge machine" by philosopher Michael Strevens, the scientific method led to the triumph of empirical evidence and the demise of the view that ancient knowledge, as epitomized by the Catholic Church's official philosopher Aristotle, was sacred and could not be questioned.[34] This machine gained power from another meta-innovation, the printing press, which sharply reduced the cost of books, democratized access to knowledge, spread awareness of new inventions and technologies, and effectively promoted open science. Crucially, the wide availability of books, thanks to the tireless work of early publishing houses including the Plantin Press in Antwerp, meant that scientific and technical achievements would not be forgotten. The technological regress that had been common in past civilizations was ruled out, and solid foundations for cumulative knowledge gains were laid. Finally, the great voyages after 1500, made possible by improvements in navigation, increased European curiosity about nature and underscored the benefits associated with technology and practical knowledge. All these elements led to the establishment of a strong and widespread belief in progress, which we now typically associate with the Enlightenment, and which has been a cornerstone of Western culture ever since.[35]

The important link between innovation and economic growth was spotted in the early stages of modern growth economics. Seminal work by Robert Solow in 1956 identified changes in *total factor productivity*—